**Skills & Competences**

**Essential Skills and Competences**

[analyse business requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17) [apply ICT systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cbe2c304-1e7d-489a-97d9-a7d3e37a9db6) [assess ICT knowledge](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0dc7aa1b-b5af-4f4b-81ce-ee22ed8b6926) [create semantic trees](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cb89a5c0-b5cb-4c62-8e7e-7714631b66b5) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [manage ICT semantic integration](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fda917eb-0d6a-4371-8c93-2a10bf950966) [manage business knowledge](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/41bf7ede-fc84-4a57-8c89-b548d11b0ba1) [manage database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/29fb0fb5-dfc4-4098-ac9b-3a712000f48f) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use databases](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4463a721-69f3-413d-8321-43e3af13a4f1) [use markup languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0af062de-eb43-41e9-9b96-249e2cd22d26)

**Essential Knowledge**

[business intelligence](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/143769cb-b61e-47d8-a61e-eedfbec1016c) [business process modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/98301d4a-2cc3-439d-8d7f-0b6ac76302bb) [database development tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ef0f3a0-9ce2-4ef1-a987-0366b5cb2dbe) [information extraction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/696e3b5b-8b61-45af-ae4c-3ab700f197ec) [information structure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03ff0d53-573a-47a0-a0ad-1995815a4339) [natural language processing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fff0e2cd-d0bd-4b02-9daf-158b79d9688a) [principles of artificial intelligence](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e465a154-93f7-4973-9ce1-31659fe16dd2) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575) [systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cdd8b6b2-2fd9-453c-8d62-8a1dc6efcd49) [task algorithmisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7482a123-e801-48de-9733-262125671410) [web programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69bbd53f-fbb0-4476-b4b2-ef7844464e28)

**Optional Skills and Competences**

[build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [create database diagrams](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/84f58e3d-8669-4d83-8c1d-5dd1e73a654f) [define database physical structure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/022dc430-872a-473a-9cf4-fed4895e58ad) [design application interfaces](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b0096dc5-2e2d-4bc1-8172-05bf486c3968) [design database scheme](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6c08403c-a5bb-4868-b8c2-b7d039c0e511) [implement a virtual private network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/acf0a78c-f4e3-4bd9-a5cc-9cf4791b3b95) [manage cloud data and storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d3286405-49f8-4e8a-8046-a4376b4e7963) [manage digital documents](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b769f524-0f25-44d7-8538-5c46710a040e) [store digital data and systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/611ed16b-99bf-4840-9cab-f55d1d286e0a) [use back-up and recovery tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/82de2df7-0d6c-42b1-94ac-b3e9a029e917) [use query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75f839c2-fd9a-4ad3-8921-6e734608568d) [use spreadsheets software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1973c966-f236-40c9-b2d4-5d71a89019be) [utilise decision support system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/df0612db-366c-4ff5-b106-40b9e385195c)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/94dd823c-148e-4614-a6e8-99249b16357d) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [cloud technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd14968e-e409-45af-b362-3495ed7b10e0) [cognitive psychology](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2618f336-8e71-4666-83b5-f368edb0906d) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [data mining](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25f0ea33-b4a2-4f31-b7b4-7d20e827b180) [decision support systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ce1fe19-7f9e-4070-941d-651673a5693b) [information architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1bba98a7-92b9-450b-9235-e0c905f8f3c4) [information categorisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/93aaf65c-5aad-4e6f-a7ba-ce9bf7c0e6e6) [unstructured data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5e8abde-d2ba-4e8e-a65e-720b71180666) [visual presentation techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/348b74cd-49ce-4844-8bdf-ec188b497213)

**Skills & Competences**

**Essential Skills and Competences**

[define security policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/37bc4dc0-1233-4008-98db-1116d0c1cfcc) [develop information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3579208e-49b3-4ce4-98e7-20e41b1ce8d4) [establish an ICT security prevention plan](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/114c9698-c999-4369-8498-81bf641fe871) [implement ICT risk management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69cfc5ed-6569-4aca-a4cc-fd782ba51d9c) [lead disaster recovery exercises](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ddb65832-91a7-4157-9488-719a0e2ad87b) [maintain ICT identity management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ab49f767-296b-47d5-af56-0b4a69515b03) [manage IT security compliances](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/06358891-8424-43c5-891e-d40f226bef40) [manage disaster recovery plans](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/64852ade-6ae1-4760-ba4a-976bf07ca255) [solve ICT system problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9e06bac6-6b91-48ca-8b7d-c1f48cdecd7c)

**Essential Knowledge**

[ICT problem management techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a3ce2bf7-5562-4639-9b52-fdb4850a3904) [ICT project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/94dd823c-148e-4614-a6e8-99249b16357d) [ICT quality policy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3be6b84a-fa78-42b9-a8df-150cdb40b9d7) [ICT security standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ff589b7-68df-4ea5-ae41-b395bdb2378f) [ICT system user requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ca73ac82-867a-4afa-9732-834aebe896ff) [Internet of Things](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f049d050-12da-4e40-813a-2b5eb6df6b51) [attack vectors](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/501537a7-9d63-491d-ae02-09f04767ff1e) [computer forensics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/118a9b27-1c5a-4214-b685-1a4d9e6365ea) [information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11eebd42-44ab-401d-8a2c-bdb9fc9beb50) [internal risk management policy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0daaf096-1639-461c-bf1a-bbeea77e6b67) [internet governance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5063a99f-975b-4a7c-85e3-69ecb375b4d3) [legal requirements of ICT products](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a846cb9e-c152-41e7-bd34-45e7ff941e3b)

**Optional Skills and Competences**

[define technology strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/248894d1-42dc-474f-af6e-2da52ac0c679) [design for organisational complexity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dfff95c6-9758-4c04-a228-7eaa88dec6cd) [develop with cloud services](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b643893-0a1f-4f6c-83a1-e7eef75849b9) [execute ICT audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e1f9657-ab4e-407c-842f-b846197060e3) [identify ICT security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fe1c2b32-7fe9-4668-affa-07ff658a68cf) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [implement a firewall](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5b5053e-0ef6-4c4e-a3f2-42f955f4322c) [implement a virtual private network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/acf0a78c-f4e3-4bd9-a5cc-9cf4791b3b95) [implement anti-virus software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb2b4485-2bad-402f-8517-44bf7d9afff4) [implement spam protection](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c2cbbccf-4ffd-4626-86e7-505b39c872a0) [manage keys for data protection](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5beeff8-7c98-490a-ae2c-16fbb6a87305) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [remove computer virus or malware from a computer](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8359bd04-d2cb-4757-af1f-39a921df9efe) [use ICT ticketing system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6430eb0d-c6de-46b7-a7fc-3dd2e8e62a69) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use back-up and recovery tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/82de2df7-0d6c-42b1-94ac-b3e9a029e917)

**Optional Knowledge**

[ICT encryption](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d32db06e-bd06-4415-a7ab-1b0ee68caa9a) [ICT network security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2ddb1226-1117-4eb4-ae65-3a2f5a5a3c80) [ICT process quality models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fafe0b9d-dbd9-46bd-b770-26299539ce66) [ICT recovery techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c9e96450-421d-48af-9ee6-d9c50e29afc2) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [Open source model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b16200f4-4f39-4b8b-aa9d-3568054d6bdb) [Outsourcing model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/63f0aa84-5e4c-4eb6-8e8c-876d9feedf1f) [SaaS (service-oriented modelling)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eeca3780-8049-499f-a268-95a7ad26642c) [audit techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a536b36-c5c7-4d10-bf67-a4fb0f8549b2) [cloud monitoring and reporting](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8efa6a7a-6556-4cb8-908d-59d3b5c58d2f) [cloud security and compliance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1c2978b8-bb0d-4249-9c23-877571a4dffa) [cyber attack counter-measures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5898d99a-62a4-4e10-a2e3-0d815ce44248) [cyber security](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8088750d-8388-4170-a76f-48354c469c44) [decision support systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ce1fe19-7f9e-4070-941d-651673a5693b) [hybrid model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/67a118f4-8a5f-48f7-8e5f-de34b9ca2c37) [implement cloud security and compliance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c13fb093-5ffb-491a-b8b7-fa2d42a57e2e) [information confidentiality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a56dec32-05ef-45de-a256-ee6741f356db) [investment analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bf12b461-1c53-4d81-a395-8ba77f7483c4) [levels of software testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85f46538-ae70-498a-bfbc-b8ddafe96c7d) [mobile device management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cf532795-a1fd-43bd-8407-6e43f877e6e3) [organisational resilience](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/79f24a62-7718-46e1-9b41-37be0560a5ca) [service-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/83218cac-3599-417e-93d2-26013cdccd98) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575) [tools for ICT test automation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7557f0f4-b8bc-4ac0-b91e-222ab1ba744f) [web application security threats](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/902fb91c-3113-4004-9b4f-79aa86b638b7)

**Skills & Competences**

**Essential Skills and Competences**

[analyse ICT system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7adb8473-bcc6-4ff8-9850-76d945d40092) [define data quality criteria](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/54c9c155-9293-4329-8ed2-2e76e8b519d4) [define security policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/37bc4dc0-1233-4008-98db-1116d0c1cfcc) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [develop information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3579208e-49b3-4ce4-98e7-20e41b1ce8d4) [educate on data confidentiality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6aef2baa-5fa7-4c16-bd28-3e070ec4e4df) [ensure information security](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6833e58b-eceb-4599-9375-1b7e6ec64087) [execute ICT audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e1f9657-ab4e-407c-842f-b846197060e3) [execute software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/913e7e83-b8f8-4574-b1ca-1b38f3fd974a) [identify ICT security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fe1c2b32-7fe9-4668-affa-07ff658a68cf) [identify ICT system weaknesses](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dad7e408-162f-46a4-8567-db560e19e2fc) [implement ICT risk management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69cfc5ed-6569-4aca-a4cc-fd782ba51d9c) [keep task records](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/43b13058-68d0-40c6-8031-caf5a7b7d20c) [keep up with the latest information systems solutions](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/20c920d4-7ff7-4676-ba61-3f04490d9416) [manage IT security compliances](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/06358891-8424-43c5-891e-d40f226bef40) [manage disaster recovery plans](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/64852ade-6ae1-4760-ba4a-976bf07ca255) [monitor system performance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9190d87f-9792-42e0-bb7f-64294a656bcd) [perform data analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b92a5b2-6758-4ee3-9fb4-b6387a55cc8f) [perform risk analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1dd23dba-dd00-45ab-abf4-642902538317) [provide ICT consulting advice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/283cbcd3-7101-4dbb-be37-56f3625515b1) [report test findings](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/561c2525-5bd8-4d86-8f45-820f4be7db93) [troubleshoot](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/334e3e49-fb02-4051-809a-f06adfdc1c40) [verify formal ICT specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ee3b1553-2dc5-434b-8dcf-4ae3a40b3a48)

**Essential Knowledge**

[ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [ICT security standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ff589b7-68df-4ea5-ae41-b395bdb2378f) [attack vectors](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/501537a7-9d63-491d-ae02-09f04767ff1e) [business analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/633a3637-2c6b-40ae-ac38-289eb2a62aa6) [cyber attack counter-measures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5898d99a-62a4-4e10-a2e3-0d815ce44248) [cyber security](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8088750d-8388-4170-a76f-48354c469c44) [emergent technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42cb7669-c371-4903-9c0b-13db67b2e4bb) [information architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1bba98a7-92b9-450b-9235-e0c905f8f3c4) [information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11eebd42-44ab-401d-8a2c-bdb9fc9beb50) [operating systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f9a6f35b-01a7-40c9-8b61-b6ee46f97272) [organisational resilience](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/79f24a62-7718-46e1-9b41-37be0560a5ca) [risk management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6eff134b-e34f-4d6e-a6e8-5e47cf2228d0) [unstructured data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5e8abde-d2ba-4e8e-a65e-720b71180666)

**Optional Skills and Competences**

[consult with business clients](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9531fe02-1e1f-4a36-95f7-a76a77cd4b8d) [create project specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21fecc8a-392e-49ce-ac26-fb0696ccfead) [ensure proper document management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c241f5a5-e23f-47bf-ad24-d83ea0010166) [give live presentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c55caed2-de9e-4a25-819e-a0b0e83fba1b) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [implement a firewall](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5b5053e-0ef6-4c4e-a3f2-42f955f4322c) [implement a virtual private network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/acf0a78c-f4e3-4bd9-a5cc-9cf4791b3b95) [implement anti-virus software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb2b4485-2bad-402f-8517-44bf7d9afff4) [implement spam protection](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c2cbbccf-4ffd-4626-86e7-505b39c872a0) [lead disaster recovery exercises](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ddb65832-91a7-4157-9488-719a0e2ad87b) [manage ICT change request process](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a099c81-6a0c-4f00-bb3b-990d23ec03a5) [manage a team](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cb668e89-6ef5-4ff3-ab4a-506010e7e70b) [manage changes in ICT system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1e7ed56a-6d6b-422f-962e-38543d150755) [manage digital identity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bc0b0b5d-f6be-405a-b224-b6902a4dbe97) [manage keys for data protection](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5beeff8-7c98-490a-ae2c-16fbb6a87305) [optimise choice of ICT solution](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cfa46e9-b7da-44ac-b09e-9596dffe0425) [perform project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd5efa8c-e44d-4cbc-91c6-796018dbed68) [perform scientific research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4fabca9a-7435-4f33-b1da-3cdb00340fdc) [provide information](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/732cb4dd-af91-4c88-9a9f-5fc62144e500) [provide user documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/385479b7-5da5-4367-9763-0d15b41bb65b) [remove computer virus or malware from a computer](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8359bd04-d2cb-4757-af1f-39a921df9efe) [safeguard online privacy and identity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4b2a278-2123-4450-8b43-be01c4f341da) [track key performance indicators](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8dcbcabe-09f7-4d11-940d-125af57bbc40)

**Optional Knowledge**

[C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [ICT encryption](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d32db06e-bd06-4415-a7ab-1b0ee68caa9a) [ICT process quality models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fafe0b9d-dbd9-46bd-b770-26299539ce66) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [Internet of Things](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f049d050-12da-4e40-813a-2b5eb6df6b51) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [business intelligence](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/143769cb-b61e-47d8-a61e-eedfbec1016c) [cloud monitoring and reporting](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8efa6a7a-6556-4cb8-908d-59d3b5c58d2f) [cloud security and compliance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1c2978b8-bb0d-4249-9c23-877571a4dffa) [cloud technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd14968e-e409-45af-b362-3495ed7b10e0) [copyright legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e2103a1d-4a84-47a9-b4f7-774787573449) [defence standard procedures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/17924c75-45f4-4593-afac-eea0d51f04b5) [embedded systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2180bd8c-86de-4889-8165-adac902eee9d) [internet governance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5063a99f-975b-4a7c-85e3-69ecb375b4d3) [leadership principles](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5145a9a-602e-40bf-b3e1-f04cf9c3ef86) [project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7111b95d-0ce3-441a-9d92-4c75d05c4388) [web application security threats](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/902fb91c-3113-4004-9b4f-79aa86b638b7)

**Skills & Competences**

**Essential Skills and Competences**

[apply company policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a43729f-2a79-4dae-9faa-95520daae79f) [attend to ICT systems quality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7f0b1a66-ebaf-4c8a-b606-4c1844eb692e) [ensure proper document management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c241f5a5-e23f-47bf-ad24-d83ea0010166) [identify ICT system weaknesses](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dad7e408-162f-46a4-8567-db560e19e2fc) [interpret technical texts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85c11255-469f-41bd-a6d1-382bc4a87783) [maintain ICT identity management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ab49f767-296b-47d5-af56-0b4a69515b03) [maintain database security](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ec85cc63-4e24-4631-bf92-8789db2605c0) [manage ICT data architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4d85b881-e490-4b4c-897a-2faa4ef53956) [manage IT security compliances](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/06358891-8424-43c5-891e-d40f226bef40) [perform ICT troubleshooting](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/744442ac-c157-4350-8be0-ce454df4f5c5) [solve ICT system problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9e06bac6-6b91-48ca-8b7d-c1f48cdecd7c)

**Essential Knowledge**

[ICT network security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2ddb1226-1117-4eb4-ae65-3a2f5a5a3c80) [Internet of Things](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f049d050-12da-4e40-813a-2b5eb6df6b51) [cyber attack counter-measures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5898d99a-62a4-4e10-a2e3-0d815ce44248) [database development tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ef0f3a0-9ce2-4ef1-a987-0366b5cb2dbe) [internet governance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5063a99f-975b-4a7c-85e3-69ecb375b4d3) [mobile device management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cf532795-a1fd-43bd-8407-6e43f877e6e3) [operating systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f9a6f35b-01a7-40c9-8b61-b6ee46f97272) [organisational resilience](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/79f24a62-7718-46e1-9b41-37be0560a5ca) [quality assurance methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7cc6dc5-d56b-4323-8e5c-47c4022f615f) [system backup best practice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47ca0da1-cae5-4395-ae6b-fd97b9ff48d3)

**Optional Skills and Competences**

[address problems critically](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9f16465-56a9-426b-a047-0f9f1f95ec92) [assess ICT knowledge](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0dc7aa1b-b5af-4f4b-81ce-ee22ed8b6926) [build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [execute ICT audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e1f9657-ab4e-407c-842f-b846197060e3) [execute software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/913e7e83-b8f8-4574-b1ca-1b38f3fd974a) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [implement a firewall](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5b5053e-0ef6-4c4e-a3f2-42f955f4322c) [implement a virtual private network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/acf0a78c-f4e3-4bd9-a5cc-9cf4791b3b95) [implement anti-virus software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb2b4485-2bad-402f-8517-44bf7d9afff4) [lead disaster recovery exercises](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ddb65832-91a7-4157-9488-719a0e2ad87b) [manage ICT virtualisation environments](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ae4f0cc6-e0b9-47f5-bdca-2fc2e6316dce) [manage cloud data and storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d3286405-49f8-4e8a-8046-a4376b4e7963) [manage database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/29fb0fb5-dfc4-4098-ac9b-3a712000f48f) [manage keys for data protection](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5beeff8-7c98-490a-ae2c-16fbb6a87305) [perform backups](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cf3e976d-2c3e-495c-a874-f9e8a66d3b48) [remove computer virus or malware from a computer](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8359bd04-d2cb-4757-af1f-39a921df9efe) [respond to incidents in cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/440d5784-52a5-4729-8b04-29f978bd896d) [safeguard online privacy and identity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4b2a278-2123-4450-8b43-be01c4f341da) [store digital data and systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/611ed16b-99bf-4840-9cab-f55d1d286e0a) [train employees](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e54ff029-1ce9-447d-a5b2-eb7283a23e6e) [use scripting programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5ef0c719-5bcb-49f8-b8eb-824388225333)

**Optional Knowledge**

[ICT encryption](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d32db06e-bd06-4415-a7ab-1b0ee68caa9a) [ICT infrastructure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d0c6d77e-cb25-4770-bf77-2073fc5f7523) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [ICT security standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ff589b7-68df-4ea5-ae41-b395bdb2378f) [cloud monitoring and reporting](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8efa6a7a-6556-4cb8-908d-59d3b5c58d2f) [cloud security and compliance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1c2978b8-bb0d-4249-9c23-877571a4dffa) [computer forensics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/118a9b27-1c5a-4214-b685-1a4d9e6365ea) [cyber security](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8088750d-8388-4170-a76f-48354c469c44) [implement cloud security and compliance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c13fb093-5ffb-491a-b8b7-fa2d42a57e2e) [information confidentiality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a56dec32-05ef-45de-a256-ee6741f356db) [information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11eebd42-44ab-401d-8a2c-bdb9fc9beb50) [web application security threats](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/902fb91c-3113-4004-9b4f-79aa86b638b7)

**Skills & Competences**

**Essential Skills and Competences**

[analyse business processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56042303-972b-41be-9310-58467599ff7e) [analyse the context of an organisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9714735d-6f60-440b-bdbc-aaf45ebcbe78) [comply with legal regulations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3d3ee5c3-4286-457f-9f76-1704011f7e11) [develop contingency plans for emergencies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fa3567c8-a7c1-40de-bac0-a4f5a85b9f1a) [develop information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3579208e-49b3-4ce4-98e7-20e41b1ce8d4) [execute ICT audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e1f9657-ab4e-407c-842f-b846197060e3) [identify ICT security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fe1c2b32-7fe9-4668-affa-07ff658a68cf) [implement ICT recovery system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fc2f1d4f-a46f-471e-a618-cbd4d0496a53) [implement ICT risk management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69cfc5ed-6569-4aca-a4cc-fd782ba51d9c) [lead disaster recovery exercises](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ddb65832-91a7-4157-9488-719a0e2ad87b) [manage IT security compliances](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/06358891-8424-43c5-891e-d40f226bef40) [manage disaster recovery plans](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/64852ade-6ae1-4760-ba4a-976bf07ca255) [manage system security](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2a3a96a3-709e-4d60-81f6-d247d6933f13) [perform ICT security testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f4a85869-1855-45d5-a43c-7ee8cd451996)

**Essential Knowledge**

[ICT recovery techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c9e96450-421d-48af-9ee6-d9c50e29afc2) [cyber security](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8088750d-8388-4170-a76f-48354c469c44) [internal risk management policy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0daaf096-1639-461c-bf1a-bbeea77e6b67) [organisational resilience](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/79f24a62-7718-46e1-9b41-37be0560a5ca) [system backup best practice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47ca0da1-cae5-4395-ae6b-fd97b9ff48d3)

**Optional Skills and Competences**

[advise on strengthening security](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/370ebe1f-55a5-424f-a44e-f3c19222d63b) [analyse business requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17) [build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [coordinate technological activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/af607e5e-4ba1-4e5f-a2a6-dc05806567c7) [define security policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/37bc4dc0-1233-4008-98db-1116d0c1cfcc) [manage budgets](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21c5790c-0930-4d74-b3b0-84caf5af12ea) [manage keys for data protection](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5beeff8-7c98-490a-ae2c-16fbb6a87305) [perform procurement processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9e9a4209-c7cf-4f6e-973e-dc2ffadccc74) [perform project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd5efa8c-e44d-4cbc-91c6-796018dbed68) [provide cost benefit analysis reports](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/48b68726-0fd6-4e03-a5eb-82236516ee7a) [respond to incidents in cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/440d5784-52a5-4729-8b04-29f978bd896d) [train employees](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e54ff029-1ce9-447d-a5b2-eb7283a23e6e)

**Optional Knowledge**

[ICT network security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2ddb1226-1117-4eb4-ae65-3a2f5a5a3c80) [ICT process quality models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fafe0b9d-dbd9-46bd-b770-26299539ce66) [ICT system user requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ca73ac82-867a-4afa-9732-834aebe896ff) [business process modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/98301d4a-2cc3-439d-8d7f-0b6ac76302bb) [cloud security and compliance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1c2978b8-bb0d-4249-9c23-877571a4dffa) [human-computer interaction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9136cbf1-7916-4f1c-bc9a-0318ee1d6016)

**Skills & Competences**

**Essential Skills and Competences**

[address problems critically](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9f16465-56a9-426b-a047-0f9f1f95ec92) [analyse the context of an organisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9714735d-6f60-440b-bdbc-aaf45ebcbe78) [develop code exploits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/af313ba1-a39e-49ac-99ec-94630fbe4f7f) [execute ICT audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e1f9657-ab4e-407c-842f-b846197060e3) [execute software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/913e7e83-b8f8-4574-b1ca-1b38f3fd974a) [identify ICT security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fe1c2b32-7fe9-4668-affa-07ff658a68cf) [identify ICT system weaknesses](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dad7e408-162f-46a4-8567-db560e19e2fc) [monitor system performance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9190d87f-9792-42e0-bb7f-64294a656bcd) [perform ICT security testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f4a85869-1855-45d5-a43c-7ee8cd451996) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e)

**Essential Knowledge**

[attack vectors](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/501537a7-9d63-491d-ae02-09f04767ff1e) [computer forensics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/118a9b27-1c5a-4214-b685-1a4d9e6365ea) [cyber attack counter-measures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5898d99a-62a4-4e10-a2e3-0d815ce44248) [ethics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cef5c0f8-1e40-4c09-b6a7-aa7811849e5d) [legal requirements of ICT products](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a846cb9e-c152-41e7-bd34-45e7ff941e3b) [penetration testing tool](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/de586dcf-d7e5-4340-bf5b-d59026f1b436) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6) [tools for ICT test automation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7557f0f4-b8bc-4ac0-b91e-222ab1ba744f) [web application security threats](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/902fb91c-3113-4004-9b4f-79aa86b638b7)

**Optional Skills and Competences**

[define security policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/37bc4dc0-1233-4008-98db-1116d0c1cfcc) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [implement a firewall](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5b5053e-0ef6-4c4e-a3f2-42f955f4322c) [maintain ICT server](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5ac9226-0ace-4d34-a1c3-7b3845834a98) [manage IT security compliances](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/06358891-8424-43c5-891e-d40f226bef40) [manage cloud data and storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d3286405-49f8-4e8a-8046-a4376b4e7963) [perform project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd5efa8c-e44d-4cbc-91c6-796018dbed68) [remove computer virus or malware from a computer](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8359bd04-d2cb-4757-af1f-39a921df9efe) [solve ICT system problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9e06bac6-6b91-48ca-8b7d-c1f48cdecd7c)

**Optional Knowledge**

[Aircrack (penetration testing tool)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/557e9247-1a2d-4497-aa7f-0cded7768da1) [Backbox (penetration testing tool)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58783f72-5098-4807-b1d1-954ec2ae94c4) [BlackArch](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8a30eb28-eca0-4ab6-8c05-32c47d3e0dd6) [Cain and Abel (penetration testing tool)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09cf2c34-6f93-4a19-a9f1-c0d866414bcc) [ICT encryption](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d32db06e-bd06-4415-a7ab-1b0ee68caa9a) [ICT network security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2ddb1226-1117-4eb4-ae65-3a2f5a5a3c80) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [ICT security standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ff589b7-68df-4ea5-ae41-b395bdb2378f) [Internet of Things](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f049d050-12da-4e40-813a-2b5eb6df6b51) [John The Ripper (penetration testing tool)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7bf4539a-3f2e-4485-876b-1c9306b181af) [Kali Linux](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/625b57ee-29d4-425b-bf99-9fd54dd021fe) [Maltego](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/024037ca-96a9-4cb8-ba86-2cd5a209c90a) [Metasploit](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/50597e96-9b6a-4736-ac79-dd80f36c0269) [Nessus](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2891f0dc-4426-4a9a-8fbb-db4fb0a66f91) [Nexpose](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f0010b93-5552-45cb-ad26-168c8168f319) [OWASP ZAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1ce4cddd-4a74-458e-a2d4-152ca939475a) [Open source model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b16200f4-4f39-4b8b-aa9d-3568054d6bdb) [Outsourcing model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/63f0aa84-5e4c-4eb6-8e8c-876d9feedf1f) [Parrot Security OS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/afd63e8c-a4e7-42d3-86c9-3b2dd549a353) [SaaS (service-oriented modelling)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eeca3780-8049-499f-a268-95a7ad26642c) [Samurai Web Testing Framework](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/baf1fadb-975a-42be-9744-d8ba02304d09) [WhiteHat Sentinel](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e79dab00-fe87-48f2-b8cc-f48b68bc7f35) [Wireshark](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8fa510d0-a8a6-4932-a361-00f8442cfe23) [cyber security](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8088750d-8388-4170-a76f-48354c469c44) [hybrid model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/67a118f4-8a5f-48f7-8e5f-de34b9ca2c37) [information confidentiality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a56dec32-05ef-45de-a256-ee6741f356db) [information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11eebd42-44ab-401d-8a2c-bdb9fc9beb50) [internet governance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5063a99f-975b-4a7c-85e3-69ecb375b4d3) [levels of software testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85f46538-ae70-498a-bfbc-b8ddafe96c7d) [organisational resilience](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/79f24a62-7718-46e1-9b41-37be0560a5ca) [proxy servers](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/553e1d2d-abf1-4b37-8ac4-c5c78a8edbc0) [service-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/83218cac-3599-417e-93d2-26013cdccd98)

**Skills & Competences**

**Essential Skills and Competences**

[analyse ICT system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7adb8473-bcc6-4ff8-9850-76d945d40092) [create flowchart diagram](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/901105f8-3a08-453e-b1dc-23619e317fd3) [define security policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/37bc4dc0-1233-4008-98db-1116d0c1cfcc) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [develop ICT device driver](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85616cc4-98bf-4355-9cf1-72ff11752848) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [execute software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/913e7e83-b8f8-4574-b1ca-1b38f3fd974a) [identify ICT security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fe1c2b32-7fe9-4668-affa-07ff658a68cf) [identify ICT system weaknesses](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dad7e408-162f-46a4-8567-db560e19e2fc) [interpret technical texts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85c11255-469f-41bd-a6d1-382bc4a87783) [keep up with the latest information systems solutions](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/20c920d4-7ff7-4676-ba61-3f04490d9416) [manage IT security compliances](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/06358891-8424-43c5-891e-d40f226bef40) [monitor system performance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9190d87f-9792-42e0-bb7f-64294a656bcd) [perform ICT security testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f4a85869-1855-45d5-a43c-7ee8cd451996) [perform risk analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1dd23dba-dd00-45ab-abf4-642902538317) [provide ICT consulting advice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/283cbcd3-7101-4dbb-be37-56f3625515b1) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [report test findings](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/561c2525-5bd8-4d86-8f45-820f4be7db93) [use software design patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b7a79e5-84d8-4880-be66-3d9bb05bea17) [use software libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8b94aa1e-89c9-459d-b3b4-1dfab8dec2df) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Essential Knowledge**

[ICT network security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2ddb1226-1117-4eb4-ae65-3a2f5a5a3c80) [ICT security standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ff589b7-68df-4ea5-ae41-b395bdb2378f) [Internet of Things](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f049d050-12da-4e40-813a-2b5eb6df6b51) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [cyber attack counter-measures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5898d99a-62a4-4e10-a2e3-0d815ce44248) [embedded systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2180bd8c-86de-4889-8165-adac902eee9d) [information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11eebd42-44ab-401d-8a2c-bdb9fc9beb50) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6)

**Optional Skills and Competences**

[debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [design user interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd33c66c-70c4-40e6-b87c-5495bd3bf26e) [develop creative ideas](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c4c49d4-9708-433f-8ca7-bf2c5211ee49) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [perform project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd5efa8c-e44d-4cbc-91c6-796018dbed68)

**Optional Knowledge**

[ICT encryption](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d32db06e-bd06-4415-a7ab-1b0ee68caa9a) [cloud technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd14968e-e409-45af-b362-3495ed7b10e0) [organisational resilience](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/79f24a62-7718-46e1-9b41-37be0560a5ca)

**Skills & Competences**

**Essential Skills and Competences**

[apply reverse engineering](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a7a14be2-78b5-4b4a-ba77-2658285e2756) [develop information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3579208e-49b3-4ce4-98e7-20e41b1ce8d4) [educate on data confidentiality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6aef2baa-5fa7-4c16-bd28-3e070ec4e4df) [gather data for forensic purposes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0c766ca3-9364-4203-916b-fed16e4814c1) [identify ICT security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fe1c2b32-7fe9-4668-affa-07ff658a68cf) [identify ICT system weaknesses](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dad7e408-162f-46a4-8567-db560e19e2fc) [implement ICT network diagnostic tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bf7ea00f-db77-4a95-9b9f-2d12b6d9fcb4) [manage IT security compliances](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/06358891-8424-43c5-891e-d40f226bef40) [manage data for legal matters](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a89a94fb-c417-49b4-a9a9-9a22e0f12697) [perform ICT security testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f4a85869-1855-45d5-a43c-7ee8cd451996) [perform forensic preservations of digital devices](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/28a0fe16-4e03-4d5e-8f0e-5198309e77a9) [provide ICT consulting advice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/283cbcd3-7101-4dbb-be37-56f3625515b1) [secure sensitive customer's information](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f09e70cb-5d8c-4c57-b027-a45127c0bf92) [use scripting programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5ef0c719-5bcb-49f8-b8eb-824388225333) [use software for data preservation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3c4c3fa1-d638-42df-8e98-2a38021da6f9)

**Essential Knowledge**

[ICT network security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2ddb1226-1117-4eb4-ae65-3a2f5a5a3c80) [ICT security standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ff589b7-68df-4ea5-ae41-b395bdb2378f) [computer forensics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/118a9b27-1c5a-4214-b685-1a4d9e6365ea) [cyber attack counter-measures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5898d99a-62a4-4e10-a2e3-0d815ce44248) [information confidentiality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a56dec32-05ef-45de-a256-ee6741f356db) [penetration testing tool](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/de586dcf-d7e5-4340-bf5b-d59026f1b436) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806)

**Optional Skills and Competences**

[analyse network configuration and performance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/545c80e8-7ab2-42fe-af64-242211e94709) [collect cyber defence data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fcbb3a90-cdde-49ff-9ecc-8e2c0a6dfca2) [design computer network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2164e860-7f20-48bc-b98c-5d9f8a561550) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [manage cloud data and storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d3286405-49f8-4e8a-8046-a4376b4e7963) [perform data mining](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4216e465-7baa-4884-a241-54b197bb9278) [use different communication channels](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/415abd43-e8e5-4643-b5da-5f11307af57a)

**Optional Knowledge**

[Aircrack (penetration testing tool)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/557e9247-1a2d-4497-aa7f-0cded7768da1) [Backbox (penetration testing tool)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58783f72-5098-4807-b1d1-954ec2ae94c4) [BlackArch](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8a30eb28-eca0-4ab6-8c05-32c47d3e0dd6) [Cain and Abel (penetration testing tool)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09cf2c34-6f93-4a19-a9f1-c0d866414bcc) [ICT encryption](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d32db06e-bd06-4415-a7ab-1b0ee68caa9a) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [John The Ripper (penetration testing tool)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7bf4539a-3f2e-4485-876b-1c9306b181af) [Kali Linux](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/625b57ee-29d4-425b-bf99-9fd54dd021fe) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [Maltego](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/024037ca-96a9-4cb8-ba86-2cd5a209c90a) [Metasploit](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/50597e96-9b6a-4736-ac79-dd80f36c0269) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [Nessus](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2891f0dc-4426-4a9a-8fbb-db4fb0a66f91) [Nexpose](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f0010b93-5552-45cb-ad26-168c8168f319) [OWASP ZAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1ce4cddd-4a74-458e-a2d4-152ca939475a) [Parrot Security OS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/afd63e8c-a4e7-42d3-86c9-3b2dd549a353) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [Samurai Web Testing Framework](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/baf1fadb-975a-42be-9744-d8ba02304d09) [THC Hydra](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f2c26cd0-f823-4549-a418-f84d23131308) [WhiteHat Sentinel](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e79dab00-fe87-48f2-b8cc-f48b68bc7f35) [Wireshark](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8fa510d0-a8a6-4932-a361-00f8442cfe23) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [cloud technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd14968e-e409-45af-b362-3495ed7b10e0) [data storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a7f0fbe0-c546-4f30-8e41-34a58c64567e) [hardware architectures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e043aeeb-78f5-4049-afbf-12bba52225bc) [hardware platforms](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/117373c8-f04b-4fff-8683-aebe36edac81) [information architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1bba98a7-92b9-450b-9235-e0c905f8f3c4) [information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11eebd42-44ab-401d-8a2c-bdb9fc9beb50) [legal requirements of ICT products](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a846cb9e-c152-41e7-bd34-45e7ff941e3b)

**Essential Skills and Competences**

[educate on data confidentiality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6aef2baa-5fa7-4c16-bd28-3e070ec4e4df) [ensure adherence to organisational ICT standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b8271c8a-cba6-4baa-80f5-6361af3f07e3) [ensure compliance with legal requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1dae8445-12e5-423a-bb26-824010e299b9) [ensure cross-department cooperation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b216d9a2-7d4e-4312-8d05-e375f4ab44d8) [ensure information privacy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71717c33-dd63-4acf-b052-a5fd5d9fc490) [identify ICT security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fe1c2b32-7fe9-4668-affa-07ff658a68cf) [implement ICT risk management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69cfc5ed-6569-4aca-a4cc-fd782ba51d9c) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [implement corporate governance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f2c63b7a-ed6c-4890-9f8c-7685d172624c) [lead disaster recovery exercises](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ddb65832-91a7-4157-9488-719a0e2ad87b) [maintain plan for continuity of operations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/909a28ce-d4b6-4567-9b74-d111f1ed9633) [manage IT security compliances](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/06358891-8424-43c5-891e-d40f226bef40) [manage disaster recovery plans](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/64852ade-6ae1-4760-ba4a-976bf07ca255) [monitor developments in field of expertise](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/23ac233d-84ad-4517-b0f5-8ca19ba2614e) [monitor technology trends](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7a17d7ce-01a2-4746-bbcc-22ffe22fa16e) [utilise decision support system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/df0612db-366c-4ff5-b106-40b9e385195c)

**Essential Knowledge**

[ICT network security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2ddb1226-1117-4eb4-ae65-3a2f5a5a3c80) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [ICT security standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ff589b7-68df-4ea5-ae41-b395bdb2378f) [attack vectors](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/501537a7-9d63-491d-ae02-09f04767ff1e) [audit techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a536b36-c5c7-4d10-bf67-a4fb0f8549b2) [cyber attack counter-measures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5898d99a-62a4-4e10-a2e3-0d815ce44248) [cyber security](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8088750d-8388-4170-a76f-48354c469c44) [data protection](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4346013-a967-4a58-a533-6b32ad1364c5) [decision support systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ce1fe19-7f9e-4070-941d-651673a5693b) [information confidentiality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a56dec32-05ef-45de-a256-ee6741f356db) [information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11eebd42-44ab-401d-8a2c-bdb9fc9beb50) [internal risk management policy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0daaf096-1639-461c-bf1a-bbeea77e6b67) [organisational resilience](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/79f24a62-7718-46e1-9b41-37be0560a5ca)

**Optional Skills and Competences**

[apply operations for an ITIL-based environment](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d12e9d68-84c5-444e-aa98-d36533bf03f6) [assess ICT knowledge](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0dc7aa1b-b5af-4f4b-81ce-ee22ed8b6926) [conduct impact evaluation of ICT processes on business](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/17c9a790-5664-4673-8237-c4cf3c5a8da5) [coordinate technological activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/af607e5e-4ba1-4e5f-a2a6-dc05806567c7) [create solutions to problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03b9b491-fc9b-4868-914a-bf7cd47b5041) [execute ICT audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e1f9657-ab4e-407c-842f-b846197060e3) [identify legal requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9bf9e17-ae47-417b-bbb1-e8b7c263ccac) [implement a firewall](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5b5053e-0ef6-4c4e-a3f2-42f955f4322c) [implement a virtual private network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/acf0a78c-f4e3-4bd9-a5cc-9cf4791b3b95) [implement anti-virus software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb2b4485-2bad-402f-8517-44bf7d9afff4) [manage digital identity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bc0b0b5d-f6be-405a-b224-b6902a4dbe97) [manage keys for data protection](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5beeff8-7c98-490a-ae2c-16fbb6a87305) [manage staff](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/339ac029-066a-4985-9f9d-b3d7c8fea0bb) [optimise choice of ICT solution](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cfa46e9-b7da-44ac-b09e-9596dffe0425) [safeguard online privacy and identity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4b2a278-2123-4450-8b43-be01c4f341da) [train employees](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e54ff029-1ce9-447d-a5b2-eb7283a23e6e) [use different communication channels](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/415abd43-e8e5-4643-b5da-5f11307af57a)

**Optional Knowledge**

[ICT communications protocols](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6e4f75b4-c60f-4623-a9ba-760c8245753b) [ICT encryption](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d32db06e-bd06-4415-a7ab-1b0ee68caa9a) [ICT infrastructure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d0c6d77e-cb25-4770-bf77-2073fc5f7523) [ICT process quality models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fafe0b9d-dbd9-46bd-b770-26299539ce66) [ICT recovery techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c9e96450-421d-48af-9ee6-d9c50e29afc2) [ICT system user requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ca73ac82-867a-4afa-9732-834aebe896ff) [Internet of Things](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f049d050-12da-4e40-813a-2b5eb6df6b51) [World Wide Web Consortium standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8696aff0-18c0-4ba6-a4d0-9a21861b3e5e) [cloud monitoring and reporting](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8efa6a7a-6556-4cb8-908d-59d3b5c58d2f) [cloud security and compliance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1c2978b8-bb0d-4249-9c23-877571a4dffa) [cloud technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd14968e-e409-45af-b362-3495ed7b10e0) [computer forensics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/118a9b27-1c5a-4214-b685-1a4d9e6365ea) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [control objectives for information and related technology](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9bb7a97a-1a16-431e-8ea6-ad0f9f59aa0a) [implement cloud security and compliance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c13fb093-5ffb-491a-b8b7-fa2d42a57e2e) [internet governance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5063a99f-975b-4a7c-85e3-69ecb375b4d3) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6) [web application security threats](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/902fb91c-3113-4004-9b4f-79aa86b638b7)

**Skills & Competences**

**Essential Skills and Competences**

[analyse network configuration and performance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/545c80e8-7ab2-42fe-af64-242211e94709) [analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [apply information security policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/86d2e2ea-1ba2-4aa6-b465-8a1f9abc81b8) [collect customer feedback on applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71746a0b-e58d-4dc4-ad03-bd84082eae21) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [design computer network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2164e860-7f20-48bc-b98c-5d9f8a561550) [develop automated migration methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0b0335f3-0aa1-491e-895e-81fc8774a300) [forecast future ICT network needs](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8fa840f7-e66a-4370-8e6d-7d554260c31c) [implement ICT network diagnostic tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bf7ea00f-db77-4a95-9b9f-2d12b6d9fcb4) [implement a virtual private network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/acf0a78c-f4e3-4bd9-a5cc-9cf4791b3b95) [migrate existing data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/020918ef-4b55-47c1-8430-ab7b8f6a7377) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use software design patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b7a79e5-84d8-4880-be66-3d9bb05bea17)

**Essential Knowledge**

[ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [ICT network routing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0da6cab1-0ee9-4391-a299-f71fbf21db56) [ICT performance analysis methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed39edd3-44d0-4a16-9796-bfb99f92baf3) [cloud technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd14968e-e409-45af-b362-3495ed7b10e0) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11eebd42-44ab-401d-8a2c-bdb9fc9beb50) [mobile operating systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/976455eb-5bbe-4493-ae64-ed16c3b009ea)

**Optional Skills and Competences**

[adapt to changes in technological development plans](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5308e60-d763-4ead-be95-88c96fb3e02b) [automate cloud tasks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ce8ae6ca-61d8-4174-b457-641de96cbff4) [create flowchart diagram](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/901105f8-3a08-453e-b1dc-23619e317fd3) [create solutions to problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03b9b491-fc9b-4868-914a-bf7cd47b5041) [design cloud networks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4da4587a-fd0b-4ca2-886c-c42a1562d432) [design for organisational complexity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dfff95c6-9758-4c04-a228-7eaa88dec6cd) [develop creative ideas](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c4c49d4-9708-433f-8ca7-bf2c5211ee49) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [develop with cloud services](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b643893-0a1f-4f6c-83a1-e7eef75849b9) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [implement a firewall](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5b5053e-0ef6-4c4e-a3f2-42f955f4322c) [implement anti-virus software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb2b4485-2bad-402f-8517-44bf7d9afff4) [implement spam protection](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c2cbbccf-4ffd-4626-86e7-505b39c872a0) [install electronic communication equipment](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/861cc783-6d4c-442e-9081-3a6e389be454) [remove computer virus or malware from a computer](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8359bd04-d2cb-4757-af1f-39a921df9efe) [use automatic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7d10fcb2-b368-48ab-996b-7c9fafcf68ed) [use back-up and recovery tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/82de2df7-0d6c-42b1-94ac-b3e9a029e917) [use concurrent programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25b291b5-8245-4d9d-b391-86a8a31d7109) [use functional programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d31fab87-2a7d-485c-b699-2901ca294b15) [use logic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c4e11ef-da18-4e19-816b-e6bc19e12424) [use object-oriented programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5b9cde20-f1b9-4adc-bfb3-dbf70b14138d)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Android (mobile operating systems)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d8829a1d-dbde-435b-b921-29d6462f35c9) [Ansible](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f8a40d6-f9ce-43ec-a72f-d4213a53f3ed) [Apache Maven](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d168770-4d9c-4096-b048-a6577818d306) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [BlackBerry](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ba04b19b-0b18-4d5c-b799-4db31a98e58d) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Eclipse (integrated development environment software)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b6a9252-2ed7-4862-a02f-1578f4a532ea) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT problem management techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a3ce2bf7-5562-4639-9b52-fdb4850a3904) [Internet of Things](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f049d050-12da-4e40-813a-2b5eb6df6b51) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Jenkins (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f47a1998-0beb-43be-9f46-380aa4d183da) [KDevelop](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/013441c1-1f13-47e9-80c4-9a53e8e1bc05) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Puppet (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6417a4cc-6f61-4459-a114-761a7fa0279d) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [STAF](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f0167e-75d9-46cf-847f-72a592880ebb) [Salt (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7451027-8249-405a-bb1b-342ff0f3fb3b) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Vagrant](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b3afb82-c4ea-4f14-be54-a757fb762663) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [Windows Phone](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/968ea96d-42d0-44fe-94b0-f11d84a8234d) [Xcode](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/449d119b-2d66-43a9-9230-7d27f16afbb6) [iOS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ce26e71f-2d47-474e-89b6-7920931ac4fc) [integrated development environment software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/925463a7-d51f-4d5b-9f79-4d28cf30acde) [network management system tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ab03c6c-281b-48f4-83e0-10eeb27a1bae) [tools for software configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2e926f-53d9-41f5-98f3-19dfaa687f3f)

**Skills & Competences**

**Essential Skills and Competences**

[adjust ICT system capacity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b1604a2d-c26a-427d-bda9-b8073a319fe9) [analyse business requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17) [analyse network bandwidth requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da042121-959d-451b-b4d0-3bbf07c1bc67) [assess ICT knowledge](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0dc7aa1b-b5af-4f4b-81ce-ee22ed8b6926) [define ICT network design policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb562019-5222-45db-a16c-730edbb1d27c) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [design ICT hardware placement](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3fb8b724-1d52-4d11-b8b8-1776f558d1f0) [design computer network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2164e860-7f20-48bc-b98c-5d9f8a561550) [design process](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c28fc20-8a60-4311-8899-5ef8729c05b3) [develop creative ideas](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c4c49d4-9708-433f-8ca7-bf2c5211ee49) [forecast future ICT network needs](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8fa840f7-e66a-4370-8e6d-7d554260c31c) [identify suppliers](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11747665-0e98-4f27-bd0d-536862cd5746) [implement ICT network diagnostic tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bf7ea00f-db77-4a95-9b9f-2d12b6d9fcb4) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [implement a firewall](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5b5053e-0ef6-4c4e-a3f2-42f955f4322c) [implement a virtual private network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/acf0a78c-f4e3-4bd9-a5cc-9cf4791b3b95) [maintain information network hardware](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19c0e68e-6e6c-4698-85dc-ef66a9de2c37) [maintain internet protocol configuration](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9aad733-959a-4178-984f-53e4bd05b420) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use back-up and recovery tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/82de2df7-0d6c-42b1-94ac-b3e9a029e917)

**Essential Knowledge**

[ICT network routing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0da6cab1-0ee9-4391-a299-f71fbf21db56) [ICT network security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2ddb1226-1117-4eb4-ae65-3a2f5a5a3c80) [ICT networking hardware](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f9e788df-d68a-4f92-92c7-80e135fc35ff) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [business process modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/98301d4a-2cc3-439d-8d7f-0b6ac76302bb)

**Optional Skills and Competences**

[apply technical communication skills](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c32ad607-0c4d-4e34-b73f-668298f7bf13) [automate cloud tasks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ce8ae6ca-61d8-4174-b457-641de96cbff4) [build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [design cloud architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11430d93-c835-48ed-8e70-285fa69c9ae6) [design cloud networks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4da4587a-fd0b-4ca2-886c-c42a1562d432) [design for organisational complexity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dfff95c6-9758-4c04-a228-7eaa88dec6cd) [develop with cloud services](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b643893-0a1f-4f6c-83a1-e7eef75849b9) [implement spam protection](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c2cbbccf-4ffd-4626-86e7-505b39c872a0) [manage staff](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/339ac029-066a-4985-9f9d-b3d7c8fea0bb) [monitor communication channels' performance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e08821b5-d6dd-4db9-a0f1-43185653c244) [perform ICT troubleshooting](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/744442ac-c157-4350-8be0-ce454df4f5c5) [perform resource planning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5dd06b8-5d17-4932-9d03-957d0c4f5051) [provide cost benefit analysis reports](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/48b68726-0fd6-4e03-a5eb-82236516ee7a) [safeguard online privacy and identity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4b2a278-2123-4450-8b43-be01c4f341da)

**Optional Knowledge**

[Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [Cisco](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/709ef32a-7435-48e2-8fa2-16e389ecab8a) [ICT network simulation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f6424ebb-8401-446b-9f7e-10d7c854da02) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [ICT security standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ff589b7-68df-4ea5-ae41-b395bdb2378f) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [attack vectors](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/501537a7-9d63-491d-ae02-09f04767ff1e) [internet governance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5063a99f-975b-4a7c-85e3-69ecb375b4d3) [legal requirements of ICT products](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a846cb9e-c152-41e7-bd34-45e7ff941e3b) [network management system tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ab03c6c-281b-48f4-83e0-10eeb27a1bae) [organisational resilience](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/79f24a62-7718-46e1-9b41-37be0560a5ca) [procurement of ICT network equipment](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/32428b21-514b-42c2-81b5-244a7804ea74)

**Skills & Competences**

**Essential Skills and Competences**

[analyse business requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17) [apply company policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a43729f-2a79-4dae-9faa-95520daae79f) [carry out statistical forecasts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be727774-46d7-43d7-aee9-1a51b5cd8c71) [develop financial statistics reports](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4f060129-8b75-4d58-a8dd-515bd8fef349) [ensure adherence to organisational ICT standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b8271c8a-cba6-4baa-80f5-6361af3f07e3) [forecast workload](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/875eeec4-fc70-4e6a-80ef-4d18356976e3) [improve business processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75b30aeb-34c0-40f4-b77d-271d75a98b14) [perform business analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/27ed854c-15b8-4ba2-90e9-ae888a219703) [perform resource planning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5dd06b8-5d17-4932-9d03-957d0c4f5051) [plan ICT capacity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a2fef437-6719-47c2-8552-73b9fe81df86) [provide cost benefit analysis reports](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/48b68726-0fd6-4e03-a5eb-82236516ee7a)

**Essential Knowledge**

[ICT capacity planning strategies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/60d48be0-4260-4b2e-85b9-aedff7a9b7d9) [ICT infrastructure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d0c6d77e-cb25-4770-bf77-2073fc5f7523) [crowdsourcing strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/694dc996-52f3-4afa-a802-672e19f061b7) [insourcing strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eff1bb34-b454-4482-8c29-65f820619f3c) [outsourcing strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f8baa62-bc2b-4cc1-942b-f540c837cfa2) [statistical analysis system software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ad59afe4-6f8a-4bc4-acfd-0f228277508a)

**Optional Skills and Competences**

[administer ICT system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0868eef3-2213-4572-9343-74931345a7d3) [collect customer feedback on applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71746a0b-e58d-4dc4-ad03-bd84082eae21) [coordinate technological activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/af607e5e-4ba1-4e5f-a2a6-dc05806567c7) [create database diagrams](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/84f58e3d-8669-4d83-8c1d-5dd1e73a654f) [create solutions to problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03b9b491-fc9b-4868-914a-bf7cd47b5041) [deploy ICT systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71c2f41e-14de-4b23-82ad-5dbcd54ba5b0) [design database scheme](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6c08403c-a5bb-4868-b8c2-b7d039c0e511) [design process](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c28fc20-8a60-4311-8899-5ef8729c05b3) [execute ICT audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e1f9657-ab4e-407c-842f-b846197060e3) [implement a virtual private network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/acf0a78c-f4e3-4bd9-a5cc-9cf4791b3b95) [perform ICT troubleshooting](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/744442ac-c157-4350-8be0-ce454df4f5c5) [perform project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd5efa8c-e44d-4cbc-91c6-796018dbed68) [plan migration to cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a52bed5-fd29-45fb-aba6-e32bccfda1c1) [provide ICT consulting advice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/283cbcd3-7101-4dbb-be37-56f3625515b1) [provide user documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/385479b7-5da5-4367-9763-0d15b41bb65b) [use different communication channels](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/415abd43-e8e5-4643-b5da-5f11307af57a) [use scripting programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5ef0c719-5bcb-49f8-b8eb-824388225333)

**Optional Knowledge**

[ICT process quality models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fafe0b9d-dbd9-46bd-b770-26299539ce66) [ICT security standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ff589b7-68df-4ea5-ae41-b395bdb2378f) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [business process modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/98301d4a-2cc3-439d-8d7f-0b6ac76302bb) [cloud technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd14968e-e409-45af-b362-3495ed7b10e0) [labour legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/08fe5910-8c4c-4679-a988-eb2ded3c4909) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575)

**Essential Skills and Competences**

[analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [collect customer feedback on applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71746a0b-e58d-4dc4-ad03-bd84082eae21) [configure ICT system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b3c8eada-b0a8-4b61-968b-b354fbfb6874) [create flowchart diagram](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/901105f8-3a08-453e-b1dc-23619e317fd3) [develop automated migration methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0b0335f3-0aa1-491e-895e-81fc8774a300) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [interpret technical texts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85c11255-469f-41bd-a6d1-382bc4a87783) [migrate existing data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/020918ef-4b55-47c1-8430-ab7b8f6a7377) [replicate customer software issues](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb3aa8c1-fb14-47b4-a352-b7975abd2480)

**Essential Knowledge**

[ICT infrastructure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d0c6d77e-cb25-4770-bf77-2073fc5f7523) [ICT performance analysis methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed39edd3-44d0-4a16-9796-bfb99f92baf3) [ICT system user requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ca73ac82-867a-4afa-9732-834aebe896ff) [cognitive psychology](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2618f336-8e71-4666-83b5-f368edb0906d) [service-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/83218cac-3599-417e-93d2-26013cdccd98)

**Optional Skills and Competences**

[create solutions to problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03b9b491-fc9b-4868-914a-bf7cd47b5041) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [do cloud refactoring](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/38716afc-a93b-44ab-96cc-2ecf67edcf32) [implement a virtual private network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/acf0a78c-f4e3-4bd9-a5cc-9cf4791b3b95) [manage cloud data and storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d3286405-49f8-4e8a-8046-a4376b4e7963) [use ICT ticketing system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6430eb0d-c6de-46b7-a7fc-3dd2e8e62a69) [use logic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c4e11ef-da18-4e19-816b-e6bc19e12424)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [CA Datacom/DB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5ed451b-ef39-47a3-aee7-8f5be0aa8431) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [DB2](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cee858e-79e8-4a4b-b99f-93c7f735d58b) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Filemaker (database management systems)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b8eb2517-37d8-43e6-9856-9c29d5c51fde) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [IBM Informix](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/84251cb1-babf-4d17-a3cd-baa642c24c8d) [ICT accessibility standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3e23db60-0c3d-498a-a6ac-ffbed0ecb033) [ICT architectural frameworks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c453cf81-6197-428e-84c6-70c773b63f27) [ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [ICT power consumption](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f88002a8-6355-4d33-9496-285c166ff375) [ICT system integration](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6fa1c2c0-a012-4ca0-9642-e01569ba322c) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Access](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3d03c40c-1b83-4793-8902-2523f40af59e) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [MySQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4da171e5-779c-4983-a76f-91c16751e99f) [ObjectStore](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4959697d-3a24-4f46-af0c-b752318e6c54) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [Open source model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b16200f4-4f39-4b8b-aa9d-3568054d6bdb) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [OpenEdge Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/43ec6db6-33f7-449b-a566-5779a7e8997a) [Oracle Relational Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/de9f85ba-e77f-48fd-8c66-f5ebaf32d655) [Outsourcing model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/63f0aa84-5e4c-4eb6-8e8c-876d9feedf1f) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [PostgreSQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a8d07b5a-c1a1-42c6-9d53-db9c7a2ca996) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [SQL Server](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c062bab3-3ea0-4291-9220-a2d8fef4bead) [SaaS (service-oriented modelling)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eeca3780-8049-499f-a268-95a7ad26642c) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [Teradata Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9eaf831-9348-4330-a83e-b7c099cdc8f6) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [cloud technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd14968e-e409-45af-b362-3495ed7b10e0) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [data storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a7f0fbe0-c546-4f30-8e41-34a58c64567e) [database management systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ab1e97ed-2319-4293-a8b7-072d2648822f) [embedded systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2180bd8c-86de-4889-8165-adac902eee9d) [hardware architectures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e043aeeb-78f5-4049-afbf-12bba52225bc) [hardware components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4b51e76e-9e8a-455f-a289-5b48246345c4) [hybrid model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/67a118f4-8a5f-48f7-8e5f-de34b9ca2c37) [information architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1bba98a7-92b9-450b-9235-e0c905f8f3c4) [interfacing techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/23b45aa6-a479-486d-9e6f-062cbab7c68a) [mobile device software frameworks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b8c01891-e3df-4a4b-948d-95b45e1788f5) [software architecture models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2450c3b3-e78e-435b-b84d-e05d984e71dc) [software components libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/484df271-bb52-49f1-8f50-f19624bf4df2) [solution deployment](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1d86f05e-e9cc-40ce-99d8-2b21cc71b16b)

**Essential Skills and Competences**

[adjust ICT system capacity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b1604a2d-c26a-427d-bda9-b8073a319fe9) [analyse network bandwidth requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da042121-959d-451b-b4d0-3bbf07c1bc67) [apply ICT system usage policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9707091a-323b-4240-877a-5999a19286f0) [define firewall rules](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/054f26ab-cfdc-4077-883c-1c4c9e9b310a) [design computer network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2164e860-7f20-48bc-b98c-5d9f8a561550) [forecast future ICT network needs](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8fa840f7-e66a-4370-8e6d-7d554260c31c) [implement ICT network diagnostic tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bf7ea00f-db77-4a95-9b9f-2d12b6d9fcb4) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [implement a firewall](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5b5053e-0ef6-4c4e-a3f2-42f955f4322c) [implement a virtual private network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/acf0a78c-f4e3-4bd9-a5cc-9cf4791b3b95) [implement anti-virus software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb2b4485-2bad-402f-8517-44bf7d9afff4) [install electronic communication equipment](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/861cc783-6d4c-442e-9081-3a6e389be454) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [interpret technical texts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85c11255-469f-41bd-a6d1-382bc4a87783) [maintain internet protocol configuration](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9aad733-959a-4178-984f-53e4bd05b420) [manage ICT virtualisation environments](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ae4f0cc6-e0b9-47f5-bdca-2fc2e6316dce) [manage email hosting service](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f8f1f725-0105-41fa-9887-4df9e7a7af1e) [perform backups](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cf3e976d-2c3e-495c-a874-f9e8a66d3b48) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [use back-up and recovery tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/82de2df7-0d6c-42b1-94ac-b3e9a029e917)

**Essential Knowledge**

[ICT network routing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0da6cab1-0ee9-4391-a299-f71fbf21db56) [ICT network security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2ddb1226-1117-4eb4-ae65-3a2f5a5a3c80) [ICT performance analysis methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed39edd3-44d0-4a16-9796-bfb99f92baf3) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [ICT system programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b105ec9b-0857-41d6-8d07-a83e58b73d90) [cloud technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd14968e-e409-45af-b362-3495ed7b10e0) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [cyber attack counter-measures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5898d99a-62a4-4e10-a2e3-0d815ce44248) [internet governance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5063a99f-975b-4a7c-85e3-69ecb375b4d3) [network management system tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ab03c6c-281b-48f4-83e0-10eeb27a1bae) [procurement of ICT network equipment](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/32428b21-514b-42c2-81b5-244a7804ea74) [quality assurance methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7cc6dc5-d56b-4323-8e5c-47c4022f615f) [solution deployment](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1d86f05e-e9cc-40ce-99d8-2b21cc71b16b)

**Optional Skills and Competences**

[acquire system component](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/90be83d9-56f1-46a4-a6bc-96c51f6c9025) [apply system organisational policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/07e47d58-dd0e-4302-9e68-70a188e89065) [automate cloud tasks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ce8ae6ca-61d8-4174-b457-641de96cbff4) [execute ICT audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e1f9657-ab4e-407c-842f-b846197060e3) [implement spam protection](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c2cbbccf-4ffd-4626-86e7-505b39c872a0) [install signal repeaters](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f0ff6f10-cbb4-44c0-acd5-ed17046b1396) [maintain ICT server](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5ac9226-0ace-4d34-a1c3-7b3845834a98) [optimise choice of ICT solution](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cfa46e9-b7da-44ac-b09e-9596dffe0425) [prepare licence agreements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d4471ae-3820-4c23-8566-f44a7bd159b2) [provide ICT system training](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/418a56a2-7cfc-4b6d-8cf5-5c2add99a849) [provide technical training](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d54a1355-05c8-45eb-9c42-267d2cfcdf44) [remove computer virus or malware from a computer](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8359bd04-d2cb-4757-af1f-39a921df9efe) [safeguard online privacy and identity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4b2a278-2123-4450-8b43-be01c4f341da) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Android (mobile operating systems)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d8829a1d-dbde-435b-b921-29d6462f35c9) [Apache Tomcat](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0fb753a1-2ef2-4429-84d2-ecb2b24daf7a) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [BlackBerry](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ba04b19b-0b18-4d5c-b799-4db31a98e58d) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [Cisco](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/709ef32a-7435-48e2-8fa2-16e389ecab8a) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT system user requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ca73ac82-867a-4afa-9732-834aebe896ff) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [Windows Phone](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/968ea96d-42d0-44fe-94b0-f11d84a8234d) [iOS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ce26e71f-2d47-474e-89b6-7920931ac4fc) [mobile operating systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/976455eb-5bbe-4493-ae64-ed16c3b009ea) [operating systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f9a6f35b-01a7-40c9-8b61-b6ee46f97272) [organisational policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3a5231a0-8c30-48ee-b671-08e2debd4441) [proxy servers](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/553e1d2d-abf1-4b37-8ac4-c5c78a8edbc0)

**Essential Skills and Competences**

[analyse business requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17) [apply ICT systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cbe2c304-1e7d-489a-97d9-a7d3e37a9db6) [assess ICT knowledge](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0dc7aa1b-b5af-4f4b-81ce-ee22ed8b6926) [create data sets](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/906323f4-00c4-4c3b-ab5a-8af77be3456e) [create database diagrams](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/84f58e3d-8669-4d83-8c1d-5dd1e73a654f) [create software design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3bddfd7c-ab6d-40c2-883d-5e97fb7640ba) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [design database scheme](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6c08403c-a5bb-4868-b8c2-b7d039c0e511) [develop automated migration methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0b0335f3-0aa1-491e-895e-81fc8774a300) [identify software for warehouse management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/772a9c72-abef-4333-9788-f4cb48ad8e08) [manage database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/29fb0fb5-dfc4-4098-ac9b-3a712000f48f) [manage standards for data exchange](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cb5cccc9-abe4-4b11-abe6-d27e5cd85fb1) [migrate existing data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/020918ef-4b55-47c1-8430-ab7b8f6a7377) [operate relational database management system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7369f779-4b71-4aab-8836-48b69c676eec) [use databases](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4463a721-69f3-413d-8321-43e3af13a4f1) [use markup languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0af062de-eb43-41e9-9b96-249e2cd22d26) [write database documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/64db87c7-2360-4e20-88d3-d222402e477c)

**Essential Knowledge**

[ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [business process modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/98301d4a-2cc3-439d-8d7f-0b6ac76302bb) [data warehouse](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ec2e4d6-7000-4905-bf1a-c5b1679416de) [database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/43ae58b9-5e56-4524-b45a-b422777a0576) [database development tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ef0f3a0-9ce2-4ef1-a987-0366b5cb2dbe) [database management systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ab1e97ed-2319-4293-a8b7-072d2648822f) [information structure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03ff0d53-573a-47a0-a0ad-1995815a4339) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cdd8b6b2-2fd9-453c-8d62-8a1dc6efcd49) [web programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69bbd53f-fbb0-4476-b4b2-ef7844464e28)

**Optional Skills and Competences**

[apply technical communication skills](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c32ad607-0c4d-4e34-b73f-668298f7bf13) [build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [define database physical structure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/022dc430-872a-473a-9cf4-fed4895e58ad) [design database backup specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ab67fbfb-0ca7-4345-8bf6-af8f59480212) [design database in the cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e796b51-49d7-4e73-95af-2e7323763f15) [design user interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd33c66c-70c4-40e6-b87c-5495bd3bf26e) [develop reporting software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2f77af-4307-4ac5-bc50-a9980cec7e83) [manage cloud data and storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d3286405-49f8-4e8a-8046-a4376b4e7963) [perform data analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b92a5b2-6758-4ee3-9fb4-b6387a55cc8f) [perform resource planning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5dd06b8-5d17-4932-9d03-957d0c4f5051) [respond to customers' inquiries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cace7a77-38b7-4cdf-8171-e17692bef5f6) [store digital data and systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/611ed16b-99bf-4840-9cab-f55d1d286e0a) [use access control software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da73370-f6b9-417d-a94c-09bf01f84aa2) [use back-up and recovery tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/82de2df7-0d6c-42b1-94ac-b3e9a029e917) [use query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75f839c2-fd9a-4ad3-8921-6e734608568d)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [CA Datacom/DB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5ed451b-ef39-47a3-aee7-8f5be0aa8431) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [DB2](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cee858e-79e8-4a4b-b99f-93c7f735d58b) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Filemaker (database management systems)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b8eb2517-37d8-43e6-9856-9c29d5c51fde) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [IBM Informix](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/84251cb1-babf-4d17-a3cd-baa642c24c8d) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [MarkLogic](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e819cc1e-09d9-47f2-b418-93972852daef) [Microsoft Access](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3d03c40c-1b83-4793-8902-2523f40af59e) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [MySQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4da171e5-779c-4983-a76f-91c16751e99f) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [ObjectStore](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4959697d-3a24-4f46-af0c-b752318e6c54) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [OpenEdge Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/43ec6db6-33f7-449b-a566-5779a7e8997a) [Oracle Relational Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/de9f85ba-e77f-48fd-8c66-f5ebaf32d655) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [PostgreSQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a8d07b5a-c1a1-42c6-9d53-db9c7a2ca996) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [SQL Server](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c062bab3-3ea0-4291-9220-a2d8fef4bead) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [Teradata Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9eaf831-9348-4330-a83e-b7c099cdc8f6) [TripleStore](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4e6d2538-a48e-48a7-8dad-14b067cfcb8b) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [data models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fecf8a0d-62c4-4e71-9b03-0f4fc2ad7bf5) [product data management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e2d0daae-2aa1-40cc-99e2-b340b02f97d3) [unstructured data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5e8abde-d2ba-4e8e-a65e-720b71180666)

**Essential Skills and Competences**

[balance database resources](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ba8fd27-275d-4bad-8c48-f668aa99a578) [create database diagrams](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/84f58e3d-8669-4d83-8c1d-5dd1e73a654f) [execute integration testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ea412de3-9d7a-4943-8d8c-c6d3c7495d0e) [implement data warehousing techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd6d2981-3d4a-4ce2-9741-cfc98c5b74bd) [integrate ICT data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/46ec0033-3c71-415e-bcff-b065675ba2dc) [manage ICT legacy implication](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/861313ba-3a1a-4d33-842a-1b8e45e2415b) [manage data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ff9db9d-d14b-426e-83f3-e7449af6c79f) [perform data cleansing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/50b100ea-74fd-4706-99db-3e4ca55e51b8) [use interface description language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a30e5a8-60a8-4fda-9f89-8e9cee38da5a) [verify formal ICT specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ee3b1553-2dc5-434b-8dcf-4ae3a40b3a48)

**Essential Knowledge**

[ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [data extraction, transformation and loading tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d0d89be-bffa-4393-b6f6-8d05bea49051) [database management systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ab1e97ed-2319-4293-a8b7-072d2648822f) [information structure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03ff0d53-573a-47a0-a0ad-1995815a4339) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806)

**Optional Skills and Competences**

[apply ICT systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cbe2c304-1e7d-489a-97d9-a7d3e37a9db6) [create solutions to problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03b9b491-fc9b-4868-914a-bf7cd47b5041) [define data quality criteria](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/54c9c155-9293-4329-8ed2-2e76e8b519d4) [define integration strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4a882a1-0263-4dd2-b29a-f0028cac2393) [design application interfaces](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b0096dc5-2e2d-4bc1-8172-05bf486c3968) [execute ICT audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e1f9657-ab4e-407c-842f-b846197060e3) [manage ICT semantic integration](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fda917eb-0d6a-4371-8c93-2a10bf950966) [manage cloud data and storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d3286405-49f8-4e8a-8046-a4376b4e7963) [perform data mining](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4216e465-7baa-4884-a241-54b197bb9278) [perform project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd5efa8c-e44d-4cbc-91c6-796018dbed68) [use scripting programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5ef0c719-5bcb-49f8-b8eb-824388225333) [write database documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/64db87c7-2360-4e20-88d3-d222402e477c)

**Optional Knowledge**

[CA Datacom/DB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5ed451b-ef39-47a3-aee7-8f5be0aa8431) [DB2](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cee858e-79e8-4a4b-b99f-93c7f735d58b) [Filemaker (database management systems)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b8eb2517-37d8-43e6-9856-9c29d5c51fde) [IBM InfoSphere DataStage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14fdac88-6d4a-4e47-9df5-02c6d1e86fdd) [IBM InfoSphere Information Server](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/81b082fb-9a00-4660-976a-10c985979100) [IBM Informix](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/84251cb1-babf-4d17-a3cd-baa642c24c8d) [Informatica PowerCenter](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0f00f63f-3ab4-4057-b92f-500584b51757) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [MarkLogic](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e819cc1e-09d9-47f2-b418-93972852daef) [Microsoft Access](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3d03c40c-1b83-4793-8902-2523f40af59e) [MySQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4da171e5-779c-4983-a76f-91c16751e99f) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [ObjectStore](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4959697d-3a24-4f46-af0c-b752318e6c54) [OpenEdge Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/43ec6db6-33f7-449b-a566-5779a7e8997a) [Oracle Data Integrator](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3af687cb-8c7a-46ea-a730-32dbaed040c6) [Oracle Relational Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/de9f85ba-e77f-48fd-8c66-f5ebaf32d655) [Oracle Warehouse Builder](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/23900e3d-06fa-424c-a5dc-c0ea42edde1e) [Pentaho Data Integration](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42c3287f-5e50-4559-a2d1-2000c70e0aab) [PostgreSQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a8d07b5a-c1a1-42c6-9d53-db9c7a2ca996) [QlikView Expressor](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/97bdd757-29d4-4126-92a6-07608825aa3b) [SAP Data Services](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f8e3425c-fe44-4ffb-bafe-0e20d91dadf4) [SAS Data Management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5a6e1e0-1b07-4432-83ba-77d593b2cb47) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [SQL Server](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c062bab3-3ea0-4291-9220-a2d8fef4bead) [SQL Server Integration Services](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f7512ab-d46d-402a-8c30-a8878d7c1f88) [Teradata Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9eaf831-9348-4330-a83e-b7c099cdc8f6) [TripleStore](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4e6d2538-a48e-48a7-8dad-14b067cfcb8b) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [business intelligence](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/143769cb-b61e-47d8-a61e-eedfbec1016c) [database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/43ae58b9-5e56-4524-b45a-b422777a0576) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575) [systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cdd8b6b2-2fd9-453c-8d62-8a1dc6efcd49)

**Essential Skills and Competences**

[apply information security policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/86d2e2ea-1ba2-4aa6-b465-8a1f9abc81b8) [balance database resources](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ba8fd27-275d-4bad-8c48-f668aa99a578) [collect customer feedback on applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71746a0b-e58d-4dc4-ad03-bd84082eae21) [create data models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fbafa41f-cd05-4109-a649-8b44d306d779) [estimate duration of work](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e207163b-7963-4c3e-9494-7a4bb000211b) [identify customer requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e0c9c11-b39e-43cf-ba95-2fe646f5de64) [interpret technical texts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85c11255-469f-41bd-a6d1-382bc4a87783) [perform backups](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cf3e976d-2c3e-495c-a874-f9e8a66d3b48) [report analysis results](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c544a9f3-5945-4b54-afed-de0697852817) [test ICT queries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e2fb1ee4-fbf9-4690-b677-3e6ff7cfdc48) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use databases](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4463a721-69f3-413d-8321-43e3af13a4f1) [write database documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/64db87c7-2360-4e20-88d3-d222402e477c)

**Essential Knowledge**

[data extraction, transformation and loading tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d0d89be-bffa-4393-b6f6-8d05bea49051) [data quality assessment](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cc7370dd-69fa-4c67-a96f-d4d135d38700) [data storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a7f0fbe0-c546-4f30-8e41-34a58c64567e) [database development tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ef0f3a0-9ce2-4ef1-a987-0366b5cb2dbe) [database management systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ab1e97ed-2319-4293-a8b7-072d2648822f) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806)

**Optional Skills and Competences**

[address problems critically](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9f16465-56a9-426b-a047-0f9f1f95ec92) [create solutions to problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03b9b491-fc9b-4868-914a-bf7cd47b5041) [execute ICT audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e1f9657-ab4e-407c-842f-b846197060e3) [execute analytical mathematical calculations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/31c69100-b612-4a61-8db5-fd314318854c) [execute integration testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ea412de3-9d7a-4943-8d8c-c6d3c7495d0e) [execute software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/913e7e83-b8f8-4574-b1ca-1b38f3fd974a) [identify ICT security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fe1c2b32-7fe9-4668-affa-07ff658a68cf) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [manage business knowledge](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/41bf7ede-fc84-4a57-8c89-b548d11b0ba1) [manage cloud data and storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d3286405-49f8-4e8a-8046-a4376b4e7963) [manage digital documents](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b769f524-0f25-44d7-8538-5c46710a040e) [perform data mining](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4216e465-7baa-4884-a241-54b197bb9278) [store digital data and systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/611ed16b-99bf-4840-9cab-f55d1d286e0a) [use back-up and recovery tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/82de2df7-0d6c-42b1-94ac-b3e9a029e917) [use personal organization software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fdf15b35-9028-4acb-bfd2-43f00a015cd9) [use query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75f839c2-fd9a-4ad3-8921-6e734608568d) [use software design patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b7a79e5-84d8-4880-be66-3d9bb05bea17) [use spreadsheets software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1973c966-f236-40c9-b2d4-5d71a89019be) [verify formal ICT specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ee3b1553-2dc5-434b-8dcf-4ae3a40b3a48)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Ajax Framework](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c88d336-c249-4537-b26e-d679a85c4b9b) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [CA Datacom/DB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5ed451b-ef39-47a3-aee7-8f5be0aa8431) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [DB2](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cee858e-79e8-4a4b-b99f-93c7f735d58b) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Filemaker (database management systems)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b8eb2517-37d8-43e6-9856-9c29d5c51fde) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [IBM InfoSphere DataStage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14fdac88-6d4a-4e47-9df5-02c6d1e86fdd) [IBM InfoSphere Information Server](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/81b082fb-9a00-4660-976a-10c985979100) [IBM Informix](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/84251cb1-babf-4d17-a3cd-baa642c24c8d) [ICT infrastructure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d0c6d77e-cb25-4770-bf77-2073fc5f7523) [ICT power consumption](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f88002a8-6355-4d33-9496-285c166ff375) [Informatica PowerCenter](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0f00f63f-3ab4-4057-b92f-500584b51757) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [JavaScript Framework](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9b9de2a4-d8af-4a7b-933a-a8334ae60067) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [MarkLogic](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e819cc1e-09d9-47f2-b418-93972852daef) [Microsoft Access](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3d03c40c-1b83-4793-8902-2523f40af59e) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [MySQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4da171e5-779c-4983-a76f-91c16751e99f) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [ObjectStore](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4959697d-3a24-4f46-af0c-b752318e6c54) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [OpenEdge Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/43ec6db6-33f7-449b-a566-5779a7e8997a) [Oracle Application Development Framework](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8764d4b1-e069-44f2-8baa-fb1eee1850ec) [Oracle Data Integrator](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3af687cb-8c7a-46ea-a730-32dbaed040c6) [Oracle Relational Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/de9f85ba-e77f-48fd-8c66-f5ebaf32d655) [Oracle Warehouse Builder](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/23900e3d-06fa-424c-a5dc-c0ea42edde1e) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Pentaho Data Integration](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42c3287f-5e50-4559-a2d1-2000c70e0aab) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [PostgreSQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a8d07b5a-c1a1-42c6-9d53-db9c7a2ca996) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [QlikView Expressor](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/97bdd757-29d4-4126-92a6-07608825aa3b) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP Data Services](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f8e3425c-fe44-4ffb-bafe-0e20d91dadf4) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS Data Management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5a6e1e0-1b07-4432-83ba-77d593b2cb47) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [SQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/598de5b0-5b58-4ea7-8058-a4bc4d18c742) [SQL Server](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c062bab3-3ea0-4291-9220-a2d8fef4bead) [SQL Server Integration Services](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f7512ab-d46d-402a-8c30-a8878d7c1f88) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [Teradata Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9eaf831-9348-4330-a83e-b7c099cdc8f6) [TripleStore](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4e6d2538-a48e-48a7-8dad-14b067cfcb8b) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [WordPress](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6d289e8b-2cc1-4eda-ab1f-ad1090ef98f0) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [hardware architectures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e043aeeb-78f5-4049-afbf-12bba52225bc)

**Essential Skills and Competences**

[analyse business requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17) [apply ICT systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cbe2c304-1e7d-489a-97d9-a7d3e37a9db6) [assess ICT knowledge](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0dc7aa1b-b5af-4f4b-81ce-ee22ed8b6926) [create data sets](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/906323f4-00c4-4c3b-ab5a-8af77be3456e) [create database diagrams](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/84f58e3d-8669-4d83-8c1d-5dd1e73a654f) [create software design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3bddfd7c-ab6d-40c2-883d-5e97fb7640ba) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [design database scheme](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6c08403c-a5bb-4868-b8c2-b7d039c0e511) [develop automated migration methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0b0335f3-0aa1-491e-895e-81fc8774a300) [manage database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/29fb0fb5-dfc4-4098-ac9b-3a712000f48f) [manage standards for data exchange](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cb5cccc9-abe4-4b11-abe6-d27e5cd85fb1) [migrate existing data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/020918ef-4b55-47c1-8430-ab7b8f6a7377) [operate relational database management system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7369f779-4b71-4aab-8836-48b69c676eec) [perform data analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b92a5b2-6758-4ee3-9fb4-b6387a55cc8f) [use markup languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0af062de-eb43-41e9-9b96-249e2cd22d26) [write database documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/64db87c7-2360-4e20-88d3-d222402e477c)

**Essential Knowledge**

[ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [business process modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/98301d4a-2cc3-439d-8d7f-0b6ac76302bb) [database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/43ae58b9-5e56-4524-b45a-b422777a0576) [database development tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ef0f3a0-9ce2-4ef1-a987-0366b5cb2dbe) [database management systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ab1e97ed-2319-4293-a8b7-072d2648822f) [information structure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03ff0d53-573a-47a0-a0ad-1995815a4339) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575) [systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cdd8b6b2-2fd9-453c-8d62-8a1dc6efcd49) [web programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69bbd53f-fbb0-4476-b4b2-ef7844464e28)

**Optional Skills and Competences**

[apply technical communication skills](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c32ad607-0c4d-4e34-b73f-668298f7bf13) [build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [define database physical structure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/022dc430-872a-473a-9cf4-fed4895e58ad) [design database backup specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ab67fbfb-0ca7-4345-8bf6-af8f59480212) [design database in the cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e796b51-49d7-4e73-95af-2e7323763f15) [manage cloud data and storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d3286405-49f8-4e8a-8046-a4376b4e7963) [perform resource planning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5dd06b8-5d17-4932-9d03-957d0c4f5051) [use access control software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da73370-f6b9-417d-a94c-09bf01f84aa2) [use databases](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4463a721-69f3-413d-8321-43e3af13a4f1)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [CA Datacom/DB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5ed451b-ef39-47a3-aee7-8f5be0aa8431) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [DB2](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cee858e-79e8-4a4b-b99f-93c7f735d58b) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Filemaker (database management systems)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b8eb2517-37d8-43e6-9856-9c29d5c51fde) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [IBM Informix](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/84251cb1-babf-4d17-a3cd-baa642c24c8d) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [MarkLogic](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e819cc1e-09d9-47f2-b418-93972852daef) [Microsoft Access](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3d03c40c-1b83-4793-8902-2523f40af59e) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [MySQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4da171e5-779c-4983-a76f-91c16751e99f) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [ObjectStore](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4959697d-3a24-4f46-af0c-b752318e6c54) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [OpenEdge Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/43ec6db6-33f7-449b-a566-5779a7e8997a) [Oracle Relational Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/de9f85ba-e77f-48fd-8c66-f5ebaf32d655) [Oracle WebLogic](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/70de94f5-9575-4edd-bca7-c797b023b9d6) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [PostgreSQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a8d07b5a-c1a1-42c6-9d53-db9c7a2ca996) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [SQL Server](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c062bab3-3ea0-4291-9220-a2d8fef4bead) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [Teradata Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9eaf831-9348-4330-a83e-b7c099cdc8f6) [TripleStore](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4e6d2538-a48e-48a7-8dad-14b067cfcb8b) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [data models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fecf8a0d-62c4-4e71-9b03-0f4fc2ad7bf5) [unstructured data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5e8abde-d2ba-4e8e-a65e-720b71180666)

**Essential Skills and Competences**

[administer ICT system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0868eef3-2213-4572-9343-74931345a7d3) [apply company policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a43729f-2a79-4dae-9faa-95520daae79f) [balance database resources](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ba8fd27-275d-4bad-8c48-f668aa99a578) [create data models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fbafa41f-cd05-4109-a649-8b44d306d779) [define database physical structure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/022dc430-872a-473a-9cf4-fed4895e58ad) [design database backup specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ab67fbfb-0ca7-4345-8bf6-af8f59480212) [design database scheme](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6c08403c-a5bb-4868-b8c2-b7d039c0e511) [interpret technical texts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85c11255-469f-41bd-a6d1-382bc4a87783) [maintain database performance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d6cdef49-b669-4507-91d1-3f959cf98e47) [maintain database security](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ec85cc63-4e24-4631-bf92-8789db2605c0) [manage database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/29fb0fb5-dfc4-4098-ac9b-3a712000f48f) [operate relational database management system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7369f779-4b71-4aab-8836-48b69c676eec) [perform ICT troubleshooting](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/744442ac-c157-4350-8be0-ce454df4f5c5) [perform backups](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cf3e976d-2c3e-495c-a874-f9e8a66d3b48) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use databases](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4463a721-69f3-413d-8321-43e3af13a4f1) [use scripting programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5ef0c719-5bcb-49f8-b8eb-824388225333)

**Essential Knowledge**

[data models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fecf8a0d-62c4-4e71-9b03-0f4fc2ad7bf5) [data quality assessment](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cc7370dd-69fa-4c67-a96f-d4d135d38700) [data storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a7f0fbe0-c546-4f30-8e41-34a58c64567e) [database development tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ef0f3a0-9ce2-4ef1-a987-0366b5cb2dbe) [database management systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ab1e97ed-2319-4293-a8b7-072d2648822f) [distributed computing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/897b393f-e7e0-4248-a40d-d77119694e83) [information structure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03ff0d53-573a-47a0-a0ad-1995815a4339) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [system backup best practice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47ca0da1-cae5-4395-ae6b-fd97b9ff48d3)

**Optional Skills and Competences**

[design database in the cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e796b51-49d7-4e73-95af-2e7323763f15) [estimate duration of work](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e207163b-7963-4c3e-9494-7a4bb000211b) [execute ICT audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e1f9657-ab4e-407c-842f-b846197060e3) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [implement a firewall](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5b5053e-0ef6-4c4e-a3f2-42f955f4322c) [implement anti-virus software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb2b4485-2bad-402f-8517-44bf7d9afff4) [manage cloud data and storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d3286405-49f8-4e8a-8046-a4376b4e7963) [provide ICT support](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c2296e2e-5fef-4f24-a24f-e5b3792268be) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [provide technical training](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d54a1355-05c8-45eb-9c42-267d2cfcdf44) [remove computer virus or malware from a computer](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8359bd04-d2cb-4757-af1f-39a921df9efe) [safeguard online privacy and identity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4b2a278-2123-4450-8b43-be01c4f341da) [support ICT system users](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/db36f7f1-5900-45bd-9ffb-f2b19c4362ac) [use automatic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7d10fcb2-b368-48ab-996b-7c9fafcf68ed) [use back-up and recovery tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/82de2df7-0d6c-42b1-94ac-b3e9a029e917) [use different communication channels](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/415abd43-e8e5-4643-b5da-5f11307af57a) [use spreadsheets software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1973c966-f236-40c9-b2d4-5d71a89019be)

**Optional Knowledge**

[DB2](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cee858e-79e8-4a4b-b99f-93c7f735d58b) [Filemaker (database management systems)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b8eb2517-37d8-43e6-9856-9c29d5c51fde) [IBM Informix](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/84251cb1-babf-4d17-a3cd-baa642c24c8d) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [MarkLogic](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e819cc1e-09d9-47f2-b418-93972852daef) [Microsoft Access](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3d03c40c-1b83-4793-8902-2523f40af59e) [MySQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4da171e5-779c-4983-a76f-91c16751e99f) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [ObjectStore](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4959697d-3a24-4f46-af0c-b752318e6c54) [OpenEdge Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/43ec6db6-33f7-449b-a566-5779a7e8997a) [Oracle Relational Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/de9f85ba-e77f-48fd-8c66-f5ebaf32d655) [PostgreSQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a8d07b5a-c1a1-42c6-9d53-db9c7a2ca996) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [SQL Server](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c062bab3-3ea0-4291-9220-a2d8fef4bead) [Teradata Database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9eaf831-9348-4330-a83e-b7c099cdc8f6) [TripleStore](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4e6d2538-a48e-48a7-8dad-14b067cfcb8b) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [business intelligence](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/143769cb-b61e-47d8-a61e-eedfbec1016c) [online analytical processing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b0a3bb25-a02f-43ed-ab1f-994fa66a424a) [quality assurance methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7cc6dc5-d56b-4323-8e5c-47c4022f615f)

**Essential Skills and Competences**

[address problems critically](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9f16465-56a9-426b-a047-0f9f1f95ec92) [assess users' interaction with ICT applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/465e7c78-cd26-4503-a5ca-40009e807705) [conduct research interview](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/896563fc-6255-4419-89c2-ffed30159ad6) [create website wireframe](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f0f5bb34-71df-4715-9c9e-03567b76ec8f) [execute ICT user research activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4c2aa71-086f-4a46-b481-2619673c9dfe) [execute software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/913e7e83-b8f8-4574-b1ca-1b38f3fd974a) [measure software usability](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be0ff6d8-5e61-4021-9c89-e40cf0b75cc6) [provide software testing documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/78a74fd1-efc6-49dc-adb1-1b0fbe35c22c) [replicate customer software issues](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb3aa8c1-fb14-47b4-a352-b7975abd2480) [report test findings](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/561c2525-5bd8-4d86-8f45-820f4be7db93) [test for behavioural patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7bdcdadb-146c-475f-8cff-921c6fd5f858) [test for emotional patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3d3db1e7-b041-495e-8a93-deeacded8a2f) [use experience map](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0737ad0a-75ac-4696-988b-565820577ac0)

**Essential Knowledge**

[application usability](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c4b626c1-e71c-44ec-9f88-042766f37fcc) [behavioural science](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/269b8734-fa1d-4c6f-a843-523fa3bbae6e) [human-computer interaction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9136cbf1-7916-4f1c-bc9a-0318ee1d6016) [levels of software testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85f46538-ae70-498a-bfbc-b8ddafe96c7d)

**Optional Skills and Competences**

[conduct ICT code review](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d1b08b3-ba1e-41f6-a466-1ac1e62eb5f0) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [design user interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd33c66c-70c4-40e6-b87c-5495bd3bf26e) [develop ICT test suite](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7253d98c-4a6d-4e37-8b6c-accca9f4b639) [develop automated software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a322874-e32f-4cd8-9683-badce67a7f73) [manage schedule of tasks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e1fe34b-f4e7-4642-8c8b-5a05ac3438e5) [use markup languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0af062de-eb43-41e9-9b96-249e2cd22d26) [use scripting programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5ef0c719-5bcb-49f8-b8eb-824388225333)

**Optional Knowledge**

[AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [cognitive psychology](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2618f336-8e71-4666-83b5-f368edb0906d) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [tools for ICT test automation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7557f0f4-b8bc-4ac0-b91e-222ab1ba744f) [unstructured data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5e8abde-d2ba-4e8e-a65e-720b71180666) [visual presentation techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/348b74cd-49ce-4844-8bdf-ec188b497213) [web programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69bbd53f-fbb0-4476-b4b2-ef7844464e28)

**Essential Skills and Competences**

[address problems critically](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9f16465-56a9-426b-a047-0f9f1f95ec92) [apply ICT systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cbe2c304-1e7d-489a-97d9-a7d3e37a9db6) [execute software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/913e7e83-b8f8-4574-b1ca-1b38f3fd974a) [identify ICT system weaknesses](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dad7e408-162f-46a4-8567-db560e19e2fc) [manage system testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ce354460-500e-4eaa-8e95-8f243fcea3db) [perform ICT security testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f4a85869-1855-45d5-a43c-7ee8cd451996) [provide software testing documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/78a74fd1-efc6-49dc-adb1-1b0fbe35c22c) [replicate customer software issues](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb3aa8c1-fb14-47b4-a352-b7975abd2480) [report test findings](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/561c2525-5bd8-4d86-8f45-820f4be7db93)

**Essential Knowledge**

[levels of software testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85f46538-ae70-498a-bfbc-b8ddafe96c7d) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6) [systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cdd8b6b2-2fd9-453c-8d62-8a1dc6efcd49)

**Optional Skills and Competences**

[conduct ICT code review](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d1b08b3-ba1e-41f6-a466-1ac1e62eb5f0) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [develop ICT test suite](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7253d98c-4a6d-4e37-8b6c-accca9f4b639) [develop automated software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a322874-e32f-4cd8-9683-badce67a7f73) [execute integration testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ea412de3-9d7a-4943-8d8c-c6d3c7495d0e) [give live presentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c55caed2-de9e-4a25-819e-a0b0e83fba1b) [manage schedule of tasks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e1fe34b-f4e7-4642-8c8b-5a05ac3438e5) [measure software usability](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be0ff6d8-5e61-4021-9c89-e40cf0b75cc6) [monitor system performance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9190d87f-9792-42e0-bb7f-64294a656bcd) [perform software recovery testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ff25cbf0-6978-4c4c-887e-d4b185410d74) [solve ICT system problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9e06bac6-6b91-48ca-8b7d-c1f48cdecd7c) [use scripting programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5ef0c719-5bcb-49f8-b8eb-824388225333)

**Optional Knowledge**

[Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [ICT network simulation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f6424ebb-8401-446b-9f7e-10d7c854da02) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [ICT system integration](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6fa1c2c0-a012-4ca0-9642-e01569ba322c) [ICT system programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b105ec9b-0857-41d6-8d07-a83e58b73d90) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [attack vectors](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/501537a7-9d63-491d-ae02-09f04767ff1e) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [tools for ICT test automation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7557f0f4-b8bc-4ac0-b91e-222ab1ba744f)

**Essential Skills and Competences**

[address problems critically](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9f16465-56a9-426b-a047-0f9f1f95ec92) [execute integration testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ea412de3-9d7a-4943-8d8c-c6d3c7495d0e) [execute software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/913e7e83-b8f8-4574-b1ca-1b38f3fd974a) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [manage system testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ce354460-500e-4eaa-8e95-8f243fcea3db) [provide software testing documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/78a74fd1-efc6-49dc-adb1-1b0fbe35c22c) [replicate customer software issues](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb3aa8c1-fb14-47b4-a352-b7975abd2480) [report test findings](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/561c2525-5bd8-4d86-8f45-820f4be7db93) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9)

**Essential Knowledge**

[levels of software testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85f46538-ae70-498a-bfbc-b8ddafe96c7d) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6)

**Optional Skills and Competences**

[conduct ICT code review](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d1b08b3-ba1e-41f6-a466-1ac1e62eb5f0) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [develop ICT test suite](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7253d98c-4a6d-4e37-8b6c-accca9f4b639) [develop automated software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a322874-e32f-4cd8-9683-badce67a7f73) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [manage schedule of tasks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e1fe34b-f4e7-4642-8c8b-5a05ac3438e5) [perform software recovery testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ff25cbf0-6978-4c4c-887e-d4b185410d74) [use scripting programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5ef0c719-5bcb-49f8-b8eb-824388225333)

**Optional Knowledge**

[Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [ICT infrastructure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d0c6d77e-cb25-4770-bf77-2073fc5f7523) [ICT network simulation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f6424ebb-8401-446b-9f7e-10d7c854da02) [ICT performance analysis methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed39edd3-44d0-4a16-9796-bfb99f92baf3) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [tools for ICT test automation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7557f0f4-b8bc-4ac0-b91e-222ab1ba744f)

**Essential Skills and Competences**

[address problems critically](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9f16465-56a9-426b-a047-0f9f1f95ec92) [assess users' interaction with ICT applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/465e7c78-cd26-4503-a5ca-40009e807705) [conduct research interview](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/896563fc-6255-4419-89c2-ffed30159ad6) [execute ICT user research activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4c2aa71-086f-4a46-b481-2619673c9dfe) [execute software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/913e7e83-b8f8-4574-b1ca-1b38f3fd974a) [measure software usability](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be0ff6d8-5e61-4021-9c89-e40cf0b75cc6) [provide software testing documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/78a74fd1-efc6-49dc-adb1-1b0fbe35c22c) [replicate customer software issues](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb3aa8c1-fb14-47b4-a352-b7975abd2480) [report test findings](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/561c2525-5bd8-4d86-8f45-820f4be7db93) [test for behavioural patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7bdcdadb-146c-475f-8cff-921c6fd5f858) [test for emotional patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3d3db1e7-b041-495e-8a93-deeacded8a2f) [test system accessibility for users with special needs](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be64bb4c-84ac-4c83-8cc7-fc8593e15136) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use experience map](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0737ad0a-75ac-4696-988b-565820577ac0)

**Essential Knowledge**

[ICT accessibility standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3e23db60-0c3d-498a-a6ac-ffbed0ecb033) [World Wide Web Consortium standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8696aff0-18c0-4ba6-a4d0-9a21861b3e5e) [application usability](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c4b626c1-e71c-44ec-9f88-042766f37fcc) [behavioural science](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/269b8734-fa1d-4c6f-a843-523fa3bbae6e) [human-computer interaction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9136cbf1-7916-4f1c-bc9a-0318ee1d6016) [levels of software testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85f46538-ae70-498a-bfbc-b8ddafe96c7d)

**Optional Skills and Competences**

[conduct ICT code review](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d1b08b3-ba1e-41f6-a466-1ac1e62eb5f0) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [design user interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd33c66c-70c4-40e6-b87c-5495bd3bf26e) [develop ICT test suite](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7253d98c-4a6d-4e37-8b6c-accca9f4b639) [develop automated software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a322874-e32f-4cd8-9683-badce67a7f73) [give live presentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c55caed2-de9e-4a25-819e-a0b0e83fba1b) [manage schedule of tasks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e1fe34b-f4e7-4642-8c8b-5a05ac3438e5) [use markup languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0af062de-eb43-41e9-9b96-249e2cd22d26) [use scripting programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5ef0c719-5bcb-49f8-b8eb-824388225333)

**Optional Knowledge**

[AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [cognitive psychology](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2618f336-8e71-4666-83b5-f368edb0906d) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [tools for ICT test automation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7557f0f4-b8bc-4ac0-b91e-222ab1ba744f) [web programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69bbd53f-fbb0-4476-b4b2-ef7844464e28)

**Essential Skills and Competences**

[address problems critically](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9f16465-56a9-426b-a047-0f9f1f95ec92) [execute software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/913e7e83-b8f8-4574-b1ca-1b38f3fd974a) [provide software testing documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/78a74fd1-efc6-49dc-adb1-1b0fbe35c22c) [replicate customer software issues](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb3aa8c1-fb14-47b4-a352-b7975abd2480) [report test findings](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/561c2525-5bd8-4d86-8f45-820f4be7db93)

**Essential Knowledge**

[application usability](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c4b626c1-e71c-44ec-9f88-042766f37fcc) [digital game genres](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e361e34-c563-4892-b9d3-873a6a4fef8a) [levels of software testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85f46538-ae70-498a-bfbc-b8ddafe96c7d) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6)

**Optional Skills and Competences**

[conduct ICT code review](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d1b08b3-ba1e-41f6-a466-1ac1e62eb5f0) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [develop ICT test suite](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7253d98c-4a6d-4e37-8b6c-accca9f4b639) [develop automated software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a322874-e32f-4cd8-9683-badce67a7f73) [manage schedule of tasks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e1fe34b-f4e7-4642-8c8b-5a05ac3438e5) [measure software usability](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be0ff6d8-5e61-4021-9c89-e40cf0b75cc6) [perform software recovery testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ff25cbf0-6978-4c4c-887e-d4b185410d74) [use scripting programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5ef0c719-5bcb-49f8-b8eb-824388225333)

**Optional Knowledge**

[Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [human-computer interaction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9136cbf1-7916-4f1c-bc9a-0318ee1d6016) [principles of animation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1c00bc98-2713-4c62-82c5-6d86f2e6a4cb) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [software interaction design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/de0be6e8-644c-4cc9-9c8d-925dd98dda56) [tools for ICT test automation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7557f0f4-b8bc-4ac0-b91e-222ab1ba744f)

**Essential Skills and Competences**

[address problems critically](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9f16465-56a9-426b-a047-0f9f1f95ec92) [execute software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/913e7e83-b8f8-4574-b1ca-1b38f3fd974a) [perform software unit testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7961413f-61d0-4722-9cd9-20a050a29899) [provide software testing documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/78a74fd1-efc6-49dc-adb1-1b0fbe35c22c) [replicate customer software issues](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb3aa8c1-fb14-47b4-a352-b7975abd2480) [report test findings](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/561c2525-5bd8-4d86-8f45-820f4be7db93)

**Essential Knowledge**

[levels of software testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85f46538-ae70-498a-bfbc-b8ddafe96c7d) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6) [software architecture models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2450c3b3-e78e-435b-b84d-e05d984e71dc) [software metrics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fb7aee4d-f6c6-4a87-8e9d-8e542b3771f8)

**Optional Skills and Competences**

[conduct ICT code review](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d1b08b3-ba1e-41f6-a466-1ac1e62eb5f0) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [develop ICT test suite](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7253d98c-4a6d-4e37-8b6c-accca9f4b639) [develop automated software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a322874-e32f-4cd8-9683-badce67a7f73) [execute integration testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ea412de3-9d7a-4943-8d8c-c6d3c7495d0e) [manage schedule of tasks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e1fe34b-f4e7-4642-8c8b-5a05ac3438e5) [measure software usability](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be0ff6d8-5e61-4021-9c89-e40cf0b75cc6) [perform software recovery testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ff25cbf0-6978-4c4c-887e-d4b185410d74) [plan software testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5d74614d-32c8-4ca4-9818-6980e52424b1) [use scripting programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5ef0c719-5bcb-49f8-b8eb-824388225333)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [ICT performance analysis methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed39edd3-44d0-4a16-9796-bfb99f92baf3) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [application usability](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c4b626c1-e71c-44ec-9f88-042766f37fcc) [audit techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a536b36-c5c7-4d10-bf67-a4fb0f8549b2) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [hardware components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4b51e76e-9e8a-455f-a289-5b48246345c4) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [software components libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/484df271-bb52-49f1-8f50-f19624bf4df2) [tools for ICT test automation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7557f0f4-b8bc-4ac0-b91e-222ab1ba744f) [unstructured data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5e8abde-d2ba-4e8e-a65e-720b71180666)

**Skills & Competences**

**Essential Skills and Competences**

[address problems critically](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9f16465-56a9-426b-a047-0f9f1f95ec92) [develop ICT test suite](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7253d98c-4a6d-4e37-8b6c-accca9f4b639) [execute software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/913e7e83-b8f8-4574-b1ca-1b38f3fd974a) [plan software testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5d74614d-32c8-4ca4-9818-6980e52424b1) [provide software testing documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/78a74fd1-efc6-49dc-adb1-1b0fbe35c22c) [replicate customer software issues](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb3aa8c1-fb14-47b4-a352-b7975abd2480) [report test findings](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/561c2525-5bd8-4d86-8f45-820f4be7db93) [set quality assurance objectives](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/22b8039c-c890-4610-9228-5527e3b98f12)

**Essential Knowledge**

[levels of software testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85f46538-ae70-498a-bfbc-b8ddafe96c7d)

**Optional Skills and Competences**

[apply statistical analysis techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/382c11ed-20d5-4ae7-b60e-15fec527fa6c) [conduct ICT code review](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d1b08b3-ba1e-41f6-a466-1ac1e62eb5f0) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [develop automated software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a322874-e32f-4cd8-9683-badce67a7f73) [give live presentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c55caed2-de9e-4a25-819e-a0b0e83fba1b) [manage schedule of tasks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e1fe34b-f4e7-4642-8c8b-5a05ac3438e5) [measure software usability](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be0ff6d8-5e61-4021-9c89-e40cf0b75cc6) [perform quality audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d83cba15-8511-4d07-b89a-9fde0d1d8241) [perform software recovery testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ff25cbf0-6978-4c4c-887e-d4b185410d74) [use scripting programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5ef0c719-5bcb-49f8-b8eb-824388225333)

**Optional Knowledge**

[Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [ICT performance analysis methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed39edd3-44d0-4a16-9796-bfb99f92baf3) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [decision support systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ce1fe19-7f9e-4070-941d-651673a5693b) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [tools for ICT test automation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7557f0f4-b8bc-4ac0-b91e-222ab1ba744f) [visual presentation techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/348b74cd-49ce-4844-8bdf-ec188b497213)

**Essential Skills and Competences**

[attend to ICT systems quality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7f0b1a66-ebaf-4c8a-b606-4c1844eb692e) [comply with legal regulations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3d3ee5c3-4286-457f-9f76-1704011f7e11) [ensure continuous preparedness for audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/26baf34d-6721-4bac-b7eb-add0bc566a82) [execute software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/913e7e83-b8f8-4574-b1ca-1b38f3fd974a) [implement strategic planning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f7b5d916-52f0-4865-b6a6-e1a3b711cb5e) [oversee quality control](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5d34adde-0b78-42b4-9d3d-69e9388d8398) [perform quality audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d83cba15-8511-4d07-b89a-9fde0d1d8241) [provide software testing documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/78a74fd1-efc6-49dc-adb1-1b0fbe35c22c) [set quality assurance objectives](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/22b8039c-c890-4610-9228-5527e3b98f12)

**Essential Knowledge**

[ICT process quality models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fafe0b9d-dbd9-46bd-b770-26299539ce66) [ICT quality policy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3be6b84a-fa78-42b9-a8df-150cdb40b9d7) [internal risk management policy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0daaf096-1639-461c-bf1a-bbeea77e6b67) [levels of software testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85f46538-ae70-498a-bfbc-b8ddafe96c7d) [quality assurance methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7cc6dc5-d56b-4323-8e5c-47c4022f615f) [quality standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8d4271ca-c9fd-40b3-875f-15f78332a49e) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6)

**Optional Skills and Competences**

[apply information security policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/86d2e2ea-1ba2-4aa6-b465-8a1f9abc81b8) [coordinate technological activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/af607e5e-4ba1-4e5f-a2a6-dc05806567c7) [define data quality criteria](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/54c9c155-9293-4329-8ed2-2e76e8b519d4) [develop automated software tests](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a322874-e32f-4cd8-9683-badce67a7f73) [develop information standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b3fc0e0-c6f9-45fc-9c6e-14bbba662979) [develop technological improvement strategies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be3d585f-f511-40ee-8d74-4ed2066e3180) [identify ICT system weaknesses](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dad7e408-162f-46a4-8567-db560e19e2fc) [identify customer requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e0c9c11-b39e-43cf-ba95-2fe646f5de64) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [manage data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ff9db9d-d14b-426e-83f3-e7449af6c79f) [provide technical training](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d54a1355-05c8-45eb-9c42-267d2cfcdf44) [track key performance indicators](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8dcbcabe-09f7-4d11-940d-125af57bbc40) [use different communication channels](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/415abd43-e8e5-4643-b5da-5f11307af57a)

**Optional Knowledge**

[Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [application usability](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c4b626c1-e71c-44ec-9f88-042766f37fcc) [data quality assessment](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cc7370dd-69fa-4c67-a96f-d4d135d38700) [database quality standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b5c7e0dc-dda3-4790-a7d1-d6d8023b3089) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575) [usability engineering](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/95ee5e38-5c1e-4cd2-a21d-6921390025a9)

**Essential Skills and Competences**

[apply company policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a43729f-2a79-4dae-9faa-95520daae79f) [build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [conduct impact evaluation of ICT processes on business](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/17c9a790-5664-4673-8237-c4cf3c5a8da5) [define security policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/37bc4dc0-1233-4008-98db-1116d0c1cfcc) [develop information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3579208e-49b3-4ce4-98e7-20e41b1ce8d4) [identify ICT security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fe1c2b32-7fe9-4668-affa-07ff658a68cf) [implement ICT recovery system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fc2f1d4f-a46f-471e-a618-cbd4d0496a53) [maintain plan for continuity of operations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/909a28ce-d4b6-4567-9b74-d111f1ed9633) [manage IT security compliances](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/06358891-8424-43c5-891e-d40f226bef40) [manage disaster recovery plans](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/64852ade-6ae1-4760-ba4a-976bf07ca255) [manage system security](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2a3a96a3-709e-4d60-81f6-d247d6933f13) [optimise choice of ICT solution](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cfa46e9-b7da-44ac-b09e-9596dffe0425) [perform backups](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cf3e976d-2c3e-495c-a874-f9e8a66d3b48) [protect ICT devices](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/df329d70-87b0-466b-a214-3431f36e2a5e) [report analysis results](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c544a9f3-5945-4b54-afed-de0697852817)

**Essential Knowledge**

[ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [ICT performance analysis methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed39edd3-44d0-4a16-9796-bfb99f92baf3) [ICT problem management techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a3ce2bf7-5562-4639-9b52-fdb4850a3904) [ICT recovery techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c9e96450-421d-48af-9ee6-d9c50e29afc2) [product usage risks analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4913d0c0-133a-4c46-aac3-f5d4989a982e) [system backup best practice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47ca0da1-cae5-4395-ae6b-fd97b9ff48d3)

**Optional Skills and Competences**

[develop strategy to solve problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7a8fb784-67fa-41e9-a75c-6b491d91f800) [give live presentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c55caed2-de9e-4a25-819e-a0b0e83fba1b) [implement a virtual private network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/acf0a78c-f4e3-4bd9-a5cc-9cf4791b3b95) [manage staff](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/339ac029-066a-4985-9f9d-b3d7c8fea0bb) [respond to incidents in cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/440d5784-52a5-4729-8b04-29f978bd896d)

**Optional Knowledge**

[Android (mobile operating systems)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d8829a1d-dbde-435b-b921-29d6462f35c9) [BlackBerry](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ba04b19b-0b18-4d5c-b799-4db31a98e58d) [ICT communications protocols](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6e4f75b4-c60f-4623-a9ba-760c8245753b) [ICT infrastructure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d0c6d77e-cb25-4770-bf77-2073fc5f7523) [ICT network security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2ddb1226-1117-4eb4-ae65-3a2f5a5a3c80) [ICT power consumption](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f88002a8-6355-4d33-9496-285c166ff375) [ICT process quality models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fafe0b9d-dbd9-46bd-b770-26299539ce66) [Windows Phone](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/968ea96d-42d0-44fe-94b0-f11d84a8234d) [cyber attack counter-measures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5898d99a-62a4-4e10-a2e3-0d815ce44248) [cyber security](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8088750d-8388-4170-a76f-48354c469c44) [hardware architectures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e043aeeb-78f5-4049-afbf-12bba52225bc) [iOS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ce26e71f-2d47-474e-89b6-7920931ac4fc) [information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11eebd42-44ab-401d-8a2c-bdb9fc9beb50) [internal risk management policy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0daaf096-1639-461c-bf1a-bbeea77e6b67) [levels of software testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85f46538-ae70-498a-bfbc-b8ddafe96c7d) [mobile operating systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/976455eb-5bbe-4493-ae64-ed16c3b009ea) [network management system tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ab03c6c-281b-48f4-83e0-10eeb27a1bae) [organisational resilience](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/79f24a62-7718-46e1-9b41-37be0560a5ca) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6) [unstructured data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5e8abde-d2ba-4e8e-a65e-720b71180666)

**Essential Skills and Competences**

[administer ICT system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0868eef3-2213-4572-9343-74931345a7d3) [build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [deploy ICT systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71c2f41e-14de-4b23-82ad-5dbcd54ba5b0) [develop automated migration methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0b0335f3-0aa1-491e-895e-81fc8774a300) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [manage ICT virtualisation environments](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ae4f0cc6-e0b9-47f5-bdca-2fc2e6316dce) [manage changes in ICT system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1e7ed56a-6d6b-422f-962e-38543d150755) [manage software releases](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/978db6a1-7297-4c89-819a-47605f2c3ba8) [perform project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd5efa8c-e44d-4cbc-91c6-796018dbed68) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [train employees](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e54ff029-1ce9-447d-a5b2-eb7283a23e6e) [use scripting programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5ef0c719-5bcb-49f8-b8eb-824388225333)

**Essential Knowledge**

[DevOps](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f0de4973-0a70-4644-8fd4-3a97080476f4) [ICT process quality models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fafe0b9d-dbd9-46bd-b770-26299539ce66) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [project configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccb2e5f2-4279-48fd-9d85-a1db42ff1e13) [tools for software configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2e926f-53d9-41f5-98f3-19dfaa687f3f)

**Optional Skills and Competences**

[apply change management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3c03ee71-4a23-448f-b79e-81fd75d27dca) [apply operations for an ITIL-based environment](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d12e9d68-84c5-444e-aa98-d36533bf03f6) [design cloud architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11430d93-c835-48ed-8e70-285fa69c9ae6) [migrate existing data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/020918ef-4b55-47c1-8430-ab7b8f6a7377) [perform software recovery testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ff25cbf0-6978-4c4c-887e-d4b185410d74) [perform software unit testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7961413f-61d0-4722-9cd9-20a050a29899) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Optional Knowledge**

[Apache Maven](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d168770-4d9c-4096-b048-a6577818d306) [Chef (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/49f85a99-086c-45b6-a6fa-eb90305af7b1) [Codenvy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/55c16653-343c-4d02-a9de-7d8e864a4592) [Jenkins (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f47a1998-0beb-43be-9f46-380aa4d183da) [Octopus Deploy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2f04bb71-d476-43b3-a60b-5df1d05f5681) [Puppet (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6417a4cc-6f61-4459-a114-761a7fa0279d) [STAF](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f0167e-75d9-46cf-847f-72a592880ebb) [Salt (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7451027-8249-405a-bb1b-342ff0f3fb3b) [Vagrant](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b3afb82-c4ea-4f14-be54-a757fb762663) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [control objectives for information and related technology](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9bb7a97a-1a16-431e-8ea6-ad0f9f59aa0a) [embedded systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2180bd8c-86de-4889-8165-adac902eee9d) [integrated development environment software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/925463a7-d51f-4d5b-9f79-4d28cf30acde)

**Essential Skills and Competences**

[build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [develop ICT workflow](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/751941a0-5645-4f8b-b97e-b252909d5edb) [develop audit plan](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed0718f6-5823-4c74-9749-2936c9c06203) [ensure adherence to organisational ICT standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b8271c8a-cba6-4baa-80f5-6361af3f07e3) [ensure compliance with legal requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1dae8445-12e5-423a-bb26-824010e299b9) [execute ICT audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e1f9657-ab4e-407c-842f-b846197060e3) [identify legal requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9bf9e17-ae47-417b-bbb1-e8b7c263ccac) [implement ICT risk management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69cfc5ed-6569-4aca-a4cc-fd782ba51d9c) [manage IT security compliances](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/06358891-8424-43c5-891e-d40f226bef40) [manage standard enterprise resource planning system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f0393af3-bcd9-41af-a36e-0cfb83b60081) [monitor technology trends](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7a17d7ce-01a2-4746-bbcc-22ffe22fa16e) [perform contract compliance audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5b8a3dd2-de10-48a0-8ce5-522f1fff8450) [prepare financial auditing reports](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3e9b580d-811b-48df-a5d1-a7bdd26f901f)

**Essential Knowledge**

[ICT project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/94dd823c-148e-4614-a6e8-99249b16357d) [attack vectors](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/501537a7-9d63-491d-ae02-09f04767ff1e) [audit techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a536b36-c5c7-4d10-bf67-a4fb0f8549b2) [control objectives for information and related technology](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9bb7a97a-1a16-431e-8ea6-ad0f9f59aa0a) [cyber security](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8088750d-8388-4170-a76f-48354c469c44) [quality standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8d4271ca-c9fd-40b3-875f-15f78332a49e)

**Optional Skills and Competences**

[coach employees](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cc9c234-f817-4f4c-908a-4d28fe3b0f4a) [develop ICT test suite](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7253d98c-4a6d-4e37-8b6c-accca9f4b639) [develop information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3579208e-49b3-4ce4-98e7-20e41b1ce8d4) [ensure information privacy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71717c33-dd63-4acf-b052-a5fd5d9fc490) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [implement corporate governance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f2c63b7a-ed6c-4890-9f8c-7685d172624c) [manage changes in ICT system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1e7ed56a-6d6b-422f-962e-38543d150755) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [train employees](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e54ff029-1ce9-447d-a5b2-eb7283a23e6e) [use markup languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0af062de-eb43-41e9-9b96-249e2cd22d26)

**Optional Knowledge**

[AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [ICT process quality models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fafe0b9d-dbd9-46bd-b770-26299539ce66) [ICT quality policy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3be6b84a-fa78-42b9-a8df-150cdb40b9d7) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [ICT security standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ff589b7-68df-4ea5-ae41-b395bdb2378f) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [cloud technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd14968e-e409-45af-b362-3495ed7b10e0) [information confidentiality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a56dec32-05ef-45de-a256-ee6741f356db) [information structure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03ff0d53-573a-47a0-a0ad-1995815a4339) [legal requirements of ICT products](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a846cb9e-c152-41e7-bd34-45e7ff941e3b) [organisational resilience](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/79f24a62-7718-46e1-9b41-37be0560a5ca) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575) [web programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69bbd53f-fbb0-4476-b4b2-ef7844464e28)

**Essential Skills and Competences**

[address problems critically](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9f16465-56a9-426b-a047-0f9f1f95ec92) [define data quality criteria](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/54c9c155-9293-4329-8ed2-2e76e8b519d4) [design database scheme](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6c08403c-a5bb-4868-b8c2-b7d039c0e511) [establish data processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2daec0e6-f0c1-43e8-8178-aedba99130ec) [handle data samples](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4a193795-fa63-414e-9f2e-bfdb3924571e) [implement data quality processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/713fb616-118e-40bc-9366-4a69879a49d5) [manage data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ff9db9d-d14b-426e-83f3-e7449af6c79f) [manage database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/29fb0fb5-dfc4-4098-ac9b-3a712000f48f) [manage standards for data exchange](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cb5cccc9-abe4-4b11-abe6-d27e5cd85fb1) [normalise data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/07889c08-7220-47c8-96f7-6068fbea00dc) [perform data cleansing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/50b100ea-74fd-4706-99db-3e4ca55e51b8) [process data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f2d57f41-43b4-4f5b-8100-3df5c21eda50) [report analysis results](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c544a9f3-5945-4b54-afed-de0697852817) [use data processing techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b70a55d-b8a4-49fc-96c6-15ab4cff2522) [utilise regular expressions](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/697dcc9f-ae92-4506-b5f2-e770d7589f74)

**Essential Knowledge**

[database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/43ae58b9-5e56-4524-b45a-b422777a0576) [information structure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03ff0d53-573a-47a0-a0ad-1995815a4339) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806)

**Optional Skills and Competences**

[build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [design database in the cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e796b51-49d7-4e73-95af-2e7323763f15) [execute ICT audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e1f9657-ab4e-407c-842f-b846197060e3) [execute analytical mathematical calculations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/31c69100-b612-4a61-8db5-fd314318854c) [manage schedule of tasks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e1fe34b-f4e7-4642-8c8b-5a05ac3438e5) [perform data analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b92a5b2-6758-4ee3-9fb4-b6387a55cc8f) [perform project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd5efa8c-e44d-4cbc-91c6-796018dbed68) [train employees](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e54ff029-1ce9-447d-a5b2-eb7283a23e6e)

**Optional Knowledge**

[LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [business processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9e84a506-df06-4be3-874a-fa01293e3dd5) [data quality assessment](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cc7370dd-69fa-4c67-a96f-d4d135d38700) [statistics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7ee4c2ea-b349-4bd2-81a3-ec31475d4833) [visual presentation techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/348b74cd-49ce-4844-8bdf-ec188b497213)

**Essential Skills and Competences**

[apply control process statistical methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ee8fee1a-75c1-43fb-b08d-779929f99249) [ensure equipment availability](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f23426-9279-4fe6-a283-24c2aa4c855d) [program a CNC controller](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bf942c60-8539-4951-83ee-63f770da1cb8) [read standard blueprints](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/68b6ef08-d823-489d-a95c-752ae6f6e6a7) [set up the controller of a machine](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9818afc-1dec-4944-8c9c-e3ae8fad176d) [troubleshoot](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/334e3e49-fb02-4051-809a-f06adfdc1c40) [use CAD software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b34e2ba1-9080-48c9-9b42-ee9192a4d3f1) [use measurement instruments](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b92758d4-4591-4df1-9ceb-f907aa71ebd9)

**Essential Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [CAD software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a2b5dcf3-5b6a-453d-876c-cff540c0faf1) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT system programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b105ec9b-0857-41d6-8d07-a83e58b73d90) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [blueprints](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d1072655-88ce-4445-8803-e6273da273e7) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [quality and cycle time optimisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3b3b7373-220a-4287-87cf-e24a208b63c6) [statistical process control](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0c77bcd5-b94a-475d-98e9-5a4327e4d726)

**Optional Skills and Competences**

[advise client on technical possibilities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7b3abd38-61ae-42a4-88bb-0884784f9ee1) [advise on safety improvements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/37838e04-ac5f-43a5-82d0-35f42351fd60) [perform data analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b92a5b2-6758-4ee3-9fb4-b6387a55cc8f) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [tend lathe](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e4a9ec84-4eb3-494b-8a70-0fcf0d687f03) [use CAM software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7a757fa5-9a6f-43ab-9e66-f8f4dba1ffcb) [use computer-aided engineering systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3c6fe585-7d12-4315-b579-e30c042088ce) [use technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cffc3e97-e942-4b13-a2f3-0bf4910c06d3)

**Optional Knowledge**

[3D modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/97965983-0da4-4902-9daf-d5cd2693ef73) [electrical engineering](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3e40c7d0-0e36-4b33-bc33-0aa87eda0561) [engineering principles](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/209a5498-3449-4689-8ed9-bd08cab4fd78) [engineering processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/72a74f69-5cf1-43c5-99b9-62a444578919) [lathe machine parts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/77980af4-bd9a-44c1-ae3b-9bcb98848ba5) [manufacturing processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3786b61f-f22e-48d1-af8d-ad4c354534db) [mathematics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4339176e-3acd-4f7f-a5d9-445bee3d23f2) [mechanics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/efa141df-f382-418f-9121-bd88fd735669)

**Essential Skills and Competences**

[analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [create flowchart diagram](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/901105f8-3a08-453e-b1dc-23619e317fd3) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [design application interfaces](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b0096dc5-2e2d-4bc1-8172-05bf486c3968) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [interpret technical texts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85c11255-469f-41bd-a6d1-382bc4a87783) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use different communication channels](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/415abd43-e8e5-4643-b5da-5f11307af57a) [use software design patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b7a79e5-84d8-4880-be66-3d9bb05bea17) [use software libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8b94aa1e-89c9-459d-b3b4-1dfab8dec2df) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Essential Knowledge**

[ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [Internet of Things](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f049d050-12da-4e40-813a-2b5eb6df6b51) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [embedded systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2180bd8c-86de-4889-8165-adac902eee9d) [industrial software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/41ec47dd-08b3-464a-9c45-c706f3e74467) [integrated development environment software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/925463a7-d51f-4d5b-9f79-4d28cf30acde) [mobile operating systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/976455eb-5bbe-4493-ae64-ed16c3b009ea) [tools for software configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2e926f-53d9-41f5-98f3-19dfaa687f3f)

**Optional Skills and Competences**

[adapt to changes in technological development plans](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5308e60-d763-4ead-be95-88c96fb3e02b) [collect customer feedback on applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71746a0b-e58d-4dc4-ad03-bd84082eae21) [design user interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd33c66c-70c4-40e6-b87c-5495bd3bf26e) [develop creative ideas](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c4c49d4-9708-433f-8ca7-bf2c5211ee49) [identify customer requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e0c9c11-b39e-43cf-ba95-2fe646f5de64) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [migrate existing data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/020918ef-4b55-47c1-8430-ab7b8f6a7377) [use automatic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7d10fcb2-b368-48ab-996b-7c9fafcf68ed) [use concurrent programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25b291b5-8245-4d9d-b391-86a8a31d7109) [use functional programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d31fab87-2a7d-485c-b699-2901ca294b15) [use logic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c4e11ef-da18-4e19-816b-e6bc19e12424) [use object-oriented programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5b9cde20-f1b9-4adc-bfb3-dbf70b14138d) [use word processing software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/81633a44-f1db-4a01-a940-804c6905e330)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Android (mobile operating systems)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d8829a1d-dbde-435b-b921-29d6462f35c9) [Ansible](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f8a40d6-f9ce-43ec-a72f-d4213a53f3ed) [Apache Maven](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d168770-4d9c-4096-b048-a6577818d306) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [BlackBerry](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ba04b19b-0b18-4d5c-b799-4db31a98e58d) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Eclipse (integrated development environment software)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b6a9252-2ed7-4862-a02f-1578f4a532ea) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Jenkins (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f47a1998-0beb-43be-9f46-380aa4d183da) [KDevelop](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/013441c1-1f13-47e9-80c4-9a53e8e1bc05) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Puppet (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6417a4cc-6f61-4459-a114-761a7fa0279d) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [STAF](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f0167e-75d9-46cf-847f-72a592880ebb) [Salt (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7451027-8249-405a-bb1b-342ff0f3fb3b) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [Windows Phone](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/968ea96d-42d0-44fe-94b0-f11d84a8234d) [World Wide Web Consortium standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8696aff0-18c0-4ba6-a4d0-9a21861b3e5e) [Xcode](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/449d119b-2d66-43a9-9230-7d27f16afbb6) [iOS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ce26e71f-2d47-474e-89b6-7920931ac4fc) [mobile device software frameworks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b8c01891-e3df-4a4b-948d-95b45e1788f5) [object-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5be3d306-6cf1-4b49-aa1d-01651dd4ba4c) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6)

**Essential Skills and Competences**

[analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [collect customer feedback on applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71746a0b-e58d-4dc4-ad03-bd84082eae21) [create flowchart diagram](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/901105f8-3a08-453e-b1dc-23619e317fd3) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [develop automated migration methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0b0335f3-0aa1-491e-895e-81fc8774a300) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [interpret technical texts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85c11255-469f-41bd-a6d1-382bc4a87783) [migrate existing data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/020918ef-4b55-47c1-8430-ab7b8f6a7377) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use software design patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b7a79e5-84d8-4880-be66-3d9bb05bea17) [use software libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8b94aa1e-89c9-459d-b3b4-1dfab8dec2df) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Essential Knowledge**

[ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [Internet of Things](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f049d050-12da-4e40-813a-2b5eb6df6b51) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [integrated development environment software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/925463a7-d51f-4d5b-9f79-4d28cf30acde) [mobile operating systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/976455eb-5bbe-4493-ae64-ed16c3b009ea) [tools for software configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2e926f-53d9-41f5-98f3-19dfaa687f3f)

**Optional Skills and Competences**

[adapt to changes in technological development plans](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5308e60-d763-4ead-be95-88c96fb3e02b) [design user interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd33c66c-70c4-40e6-b87c-5495bd3bf26e) [develop creative ideas](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c4c49d4-9708-433f-8ca7-bf2c5211ee49) [identify customer requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e0c9c11-b39e-43cf-ba95-2fe646f5de64) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [use automatic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7d10fcb2-b368-48ab-996b-7c9fafcf68ed) [use concurrent programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25b291b5-8245-4d9d-b391-86a8a31d7109) [use functional programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d31fab87-2a7d-485c-b699-2901ca294b15) [use logic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c4e11ef-da18-4e19-816b-e6bc19e12424) [use object-oriented programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5b9cde20-f1b9-4adc-bfb3-dbf70b14138d) [use query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75f839c2-fd9a-4ad3-8921-6e734608568d)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Android (mobile operating systems)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d8829a1d-dbde-435b-b921-29d6462f35c9) [Ansible](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f8a40d6-f9ce-43ec-a72f-d4213a53f3ed) [Apache Maven](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d168770-4d9c-4096-b048-a6577818d306) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [BlackBerry](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ba04b19b-0b18-4d5c-b799-4db31a98e58d) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Eclipse (integrated development environment software)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b6a9252-2ed7-4862-a02f-1578f4a532ea) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Jenkins (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f47a1998-0beb-43be-9f46-380aa4d183da) [KDevelop](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/013441c1-1f13-47e9-80c4-9a53e8e1bc05) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Puppet (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6417a4cc-6f61-4459-a114-761a7fa0279d) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [STAF](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f0167e-75d9-46cf-847f-72a592880ebb) [Salt (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7451027-8249-405a-bb1b-342ff0f3fb3b) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [Windows Phone](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/968ea96d-42d0-44fe-94b0-f11d84a8234d) [World Wide Web Consortium standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8696aff0-18c0-4ba6-a4d0-9a21861b3e5e) [Xcode](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/449d119b-2d66-43a9-9230-7d27f16afbb6) [augmented reality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/abdc7ac8-151f-40c6-bc1a-1e9b4b073290) [iOS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ce26e71f-2d47-474e-89b6-7920931ac4fc) [mobile device software frameworks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b8c01891-e3df-4a4b-948d-95b45e1788f5) [object-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5be3d306-6cf1-4b49-aa1d-01651dd4ba4c) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6)

**Essential Skills and Competences**

[analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [create flowchart diagram](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/901105f8-3a08-453e-b1dc-23619e317fd3) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [develop ICT device driver](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85616cc4-98bf-4355-9cf1-72ff11752848) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [interpret technical texts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85c11255-469f-41bd-a6d1-382bc4a87783) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [use software design patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b7a79e5-84d8-4880-be66-3d9bb05bea17) [use software libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8b94aa1e-89c9-459d-b3b4-1dfab8dec2df) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Essential Knowledge**

[ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [Internet of Things](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f049d050-12da-4e40-813a-2b5eb6df6b51) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [embedded systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2180bd8c-86de-4889-8165-adac902eee9d) [integrated development environment software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/925463a7-d51f-4d5b-9f79-4d28cf30acde) [tools for software configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2e926f-53d9-41f5-98f3-19dfaa687f3f)

**Optional Skills and Competences**

[adapt to changes in technological development plans](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5308e60-d763-4ead-be95-88c96fb3e02b) [collect customer feedback on applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71746a0b-e58d-4dc4-ad03-bd84082eae21) [design user interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd33c66c-70c4-40e6-b87c-5495bd3bf26e) [develop automated migration methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0b0335f3-0aa1-491e-895e-81fc8774a300) [develop creative ideas](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c4c49d4-9708-433f-8ca7-bf2c5211ee49) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [use automatic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7d10fcb2-b368-48ab-996b-7c9fafcf68ed) [use concurrent programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25b291b5-8245-4d9d-b391-86a8a31d7109) [use functional programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d31fab87-2a7d-485c-b699-2901ca294b15) [use logic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c4e11ef-da18-4e19-816b-e6bc19e12424) [use object-oriented programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5b9cde20-f1b9-4adc-bfb3-dbf70b14138d)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Ansible](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f8a40d6-f9ce-43ec-a72f-d4213a53f3ed) [Apache Maven](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d168770-4d9c-4096-b048-a6577818d306) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Eclipse (integrated development environment software)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b6a9252-2ed7-4862-a02f-1578f4a532ea) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Jenkins (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f47a1998-0beb-43be-9f46-380aa4d183da) [KDevelop](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/013441c1-1f13-47e9-80c4-9a53e8e1bc05) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Puppet (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6417a4cc-6f61-4459-a114-761a7fa0279d) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [STAF](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f0167e-75d9-46cf-847f-72a592880ebb) [Salt (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7451027-8249-405a-bb1b-342ff0f3fb3b) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [World Wide Web Consortium standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8696aff0-18c0-4ba6-a4d0-9a21861b3e5e) [Xcode](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/449d119b-2d66-43a9-9230-7d27f16afbb6) [object-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5be3d306-6cf1-4b49-aa1d-01651dd4ba4c) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6)

**Essential Skills and Competences**

[analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [create flowchart diagram](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/901105f8-3a08-453e-b1dc-23619e317fd3) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [develop automated migration methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0b0335f3-0aa1-491e-895e-81fc8774a300) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [identify customer requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e0c9c11-b39e-43cf-ba95-2fe646f5de64) [interpret technical texts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85c11255-469f-41bd-a6d1-382bc4a87783) [manage business knowledge](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/41bf7ede-fc84-4a57-8c89-b548d11b0ba1) [propose ICT solutions to business problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/07e51c60-763a-4335-b4ec-70a15f66d328) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use software design patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b7a79e5-84d8-4880-be66-3d9bb05bea17) [use software libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8b94aa1e-89c9-459d-b3b4-1dfab8dec2df) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Essential Knowledge**

[ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [integrated development environment software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/925463a7-d51f-4d5b-9f79-4d28cf30acde) [service-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/83218cac-3599-417e-93d2-26013cdccd98) [tools for software configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2e926f-53d9-41f5-98f3-19dfaa687f3f)

**Optional Skills and Competences**

[adapt to changes in technological development plans](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5308e60-d763-4ead-be95-88c96fb3e02b) [collect customer feedback on applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71746a0b-e58d-4dc4-ad03-bd84082eae21) [design user interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd33c66c-70c4-40e6-b87c-5495bd3bf26e) [develop creative ideas](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c4c49d4-9708-433f-8ca7-bf2c5211ee49) [develop food scanner devices](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ae6c1227-dd33-4df0-a64e-439cfdf948ea) [do cloud refactoring](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/38716afc-a93b-44ab-96cc-2ecf67edcf32) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [migrate existing data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/020918ef-4b55-47c1-8430-ab7b8f6a7377) [use automatic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7d10fcb2-b368-48ab-996b-7c9fafcf68ed) [use concurrent programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25b291b5-8245-4d9d-b391-86a8a31d7109) [use functional programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d31fab87-2a7d-485c-b699-2901ca294b15) [use logic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c4e11ef-da18-4e19-816b-e6bc19e12424) [use object-oriented programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5b9cde20-f1b9-4adc-bfb3-dbf70b14138d) [use query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75f839c2-fd9a-4ad3-8921-6e734608568d)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Ajax Framework](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c88d336-c249-4537-b26e-d679a85c4b9b) [Ansible](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f8a40d6-f9ce-43ec-a72f-d4213a53f3ed) [Apache Maven](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d168770-4d9c-4096-b048-a6577818d306) [Assembly (computer 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software)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b6a9252-2ed7-4862-a02f-1578f4a532ea) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [IBM WebSphere](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4e31589-3632-4926-91d0-15b889c90b9b) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [Internet of Things](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f049d050-12da-4e40-813a-2b5eb6df6b51) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [JavaScript Framework](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9b9de2a4-d8af-4a7b-933a-a8334ae60067) [Jenkins (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f47a1998-0beb-43be-9f46-380aa4d183da) [KDevelop](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/013441c1-1f13-47e9-80c4-9a53e8e1bc05) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [NoSQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/76ef6ed3-1658-4a1a-9593-204d799c6d0c) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [Open source model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b16200f4-4f39-4b8b-aa9d-3568054d6bdb) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [Outsourcing model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/63f0aa84-5e4c-4eb6-8e8c-876d9feedf1f) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Puppet (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6417a4cc-6f61-4459-a114-761a7fa0279d) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [SQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/598de5b0-5b58-4ea7-8058-a4bc4d18c742) [STAF](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f0167e-75d9-46cf-847f-72a592880ebb) [SaaS (service-oriented modelling)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eeca3780-8049-499f-a268-95a7ad26642c) [Salt (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7451027-8249-405a-bb1b-342ff0f3fb3b) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [WordPress](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6d289e8b-2cc1-4eda-ab1f-ad1090ef98f0) [World Wide Web Consortium standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8696aff0-18c0-4ba6-a4d0-9a21861b3e5e) [Xcode](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/449d119b-2d66-43a9-9230-7d27f16afbb6) [hybrid model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/67a118f4-8a5f-48f7-8e5f-de34b9ca2c37) [object-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5be3d306-6cf1-4b49-aa1d-01651dd4ba4c) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6) [software frameworks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/24c200e5-be20-4370-a137-ab53797f3a17)

**Essential Skills and Competences**

[analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [collect customer feedback on applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71746a0b-e58d-4dc4-ad03-bd84082eae21) [create flowchart diagram](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/901105f8-3a08-453e-b1dc-23619e317fd3) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [develop automated migration methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0b0335f3-0aa1-491e-895e-81fc8774a300) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [integrate ICT data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/46ec0033-3c71-415e-bcff-b065675ba2dc) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [migrate existing data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/020918ef-4b55-47c1-8430-ab7b8f6a7377) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [use software design patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b7a79e5-84d8-4880-be66-3d9bb05bea17) [use software libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8b94aa1e-89c9-459d-b3b4-1dfab8dec2df)

**Essential Knowledge**

[ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [integrated development environment software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/925463a7-d51f-4d5b-9f79-4d28cf30acde) [tools for software configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2e926f-53d9-41f5-98f3-19dfaa687f3f)

**Optional Skills and Competences**

[apply statistical analysis techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/382c11ed-20d5-4ae7-b60e-15fec527fa6c) [create solutions to problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03b9b491-fc9b-4868-914a-bf7cd47b5041) [do cloud refactoring](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/38716afc-a93b-44ab-96cc-2ecf67edcf32) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [manage cloud data and storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d3286405-49f8-4e8a-8046-a4376b4e7963) [provide ICT consulting advice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/283cbcd3-7101-4dbb-be37-56f3625515b1) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use automatic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7d10fcb2-b368-48ab-996b-7c9fafcf68ed) [use back-up and recovery tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/82de2df7-0d6c-42b1-94ac-b3e9a029e917) [use concurrent programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25b291b5-8245-4d9d-b391-86a8a31d7109) [use functional programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d31fab87-2a7d-485c-b699-2901ca294b15) [use logic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c4e11ef-da18-4e19-816b-e6bc19e12424) [use object-oriented programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5b9cde20-f1b9-4adc-bfb3-dbf70b14138d) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Ansible](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f8a40d6-f9ce-43ec-a72f-d4213a53f3ed) [Apache Maven](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d168770-4d9c-4096-b048-a6577818d306) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Eclipse (integrated development environment software)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b6a9252-2ed7-4862-a02f-1578f4a532ea) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Jenkins (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f47a1998-0beb-43be-9f46-380aa4d183da) [KDevelop](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/013441c1-1f13-47e9-80c4-9a53e8e1bc05) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Puppet (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6417a4cc-6f61-4459-a114-761a7fa0279d) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [STAF](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f0167e-75d9-46cf-847f-72a592880ebb) [Salt (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7451027-8249-405a-bb1b-342ff0f3fb3b) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [Xcode](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/449d119b-2d66-43a9-9230-7d27f16afbb6) [consultation methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/38788a64-6271-40ff-9e0b-5644c38322ff) [interfacing techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/23b45aa6-a479-486d-9e6f-062cbab7c68a) [legal requirements of ICT products](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a846cb9e-c152-41e7-bd34-45e7ff941e3b) [statistics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7ee4c2ea-b349-4bd2-81a3-ec31475d4833)

**Essential Skills and Competences**

[analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [collect customer feedback on applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71746a0b-e58d-4dc4-ad03-bd84082eae21) [create flowchart diagram](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/901105f8-3a08-453e-b1dc-23619e317fd3) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [implement front-end website design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c4b1f326-224a-420a-b8b3-814a8f13b6cb) [interpret technical texts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85c11255-469f-41bd-a6d1-382bc4a87783) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [translate requirements into visual design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2d6d4784-0992-48e7-b100-22d7229b3f0a) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use markup languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0af062de-eb43-41e9-9b96-249e2cd22d26) [use software design patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b7a79e5-84d8-4880-be66-3d9bb05bea17) [use software libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8b94aa1e-89c9-459d-b3b4-1dfab8dec2df)

**Essential Knowledge**

[ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [World Wide Web Consortium standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8696aff0-18c0-4ba6-a4d0-9a21861b3e5e) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [content development processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e74f4f21-8d45-412c-b5c3-652e6167ee32) [integrated development environment software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/925463a7-d51f-4d5b-9f79-4d28cf30acde) [style sheet languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c2999f0c-eb37-4cdf-b9b0-82107b628794) [tools for software configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2e926f-53d9-41f5-98f3-19dfaa687f3f) [web programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69bbd53f-fbb0-4476-b4b2-ef7844464e28)

**Optional Skills and Competences**

[adapt to changes in technological development plans](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5308e60-d763-4ead-be95-88c96fb3e02b) [compose description for web elements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8d9ce55-7bc3-4f09-8412-0a393d4b5b96) [conduct content quality assurance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/29154735-107a-4daa-a050-537f7707f34e) [design user interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd33c66c-70c4-40e6-b87c-5495bd3bf26e) [develop creative ideas](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c4c49d4-9708-433f-8ca7-bf2c5211ee49) [implement anti-virus software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb2b4485-2bad-402f-8517-44bf7d9afff4) [migrate existing data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/020918ef-4b55-47c1-8430-ab7b8f6a7377) [use automatic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7d10fcb2-b368-48ab-996b-7c9fafcf68ed) [use concurrent programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25b291b5-8245-4d9d-b391-86a8a31d7109) [use e-services](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d908a818-70ef-419e-9d60-8f459114cb2f) [use functional programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d31fab87-2a7d-485c-b699-2901ca294b15) [use logic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c4e11ef-da18-4e19-816b-e6bc19e12424) [use object-oriented programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5b9cde20-f1b9-4adc-bfb3-dbf70b14138d) [use presentation software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/234aeb8d-56c3-4531-9193-1c5e6a8d16cb) [use query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75f839c2-fd9a-4ad3-8921-6e734608568d) [use word processing software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/81633a44-f1db-4a01-a940-804c6905e330) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Ansible](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f8a40d6-f9ce-43ec-a72f-d4213a53f3ed) [Apache Maven](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d168770-4d9c-4096-b048-a6577818d306) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CSS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5d1f825-60ed-4bdd-872a-e748c387f777) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Eclipse (integrated development environment software)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b6a9252-2ed7-4862-a02f-1578f4a532ea) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [IBM WebSphere](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4e31589-3632-4926-91d0-15b889c90b9b) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [JSSS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8785ccda-6f9f-4cf3-9033-fda10653d0be) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [JavaScript Framework](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9b9de2a4-d8af-4a7b-933a-a8334ae60067) [Jboss](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b16bcbcb-1d3f-42b3-a6a5-b91348a72b70) [Jenkins (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f47a1998-0beb-43be-9f46-380aa4d183da) [KDevelop](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/013441c1-1f13-47e9-80c4-9a53e8e1bc05) [LESS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/26fa7a33-a426-4cd5-9792-33bf668612e1) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Puppet (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6417a4cc-6f61-4459-a114-761a7fa0279d) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [STAF](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f0167e-75d9-46cf-847f-72a592880ebb) [Salt (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7451027-8249-405a-bb1b-342ff0f3fb3b) [Sass](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1110c92f-3059-445a-9436-0f4200d365f5) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [WebCMS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5c66ce3a-658d-43b1-9d8d-0f39be6c0f2e) [WordPress](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6d289e8b-2cc1-4eda-ab1f-ad1090ef98f0) [Xcode](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/449d119b-2d66-43a9-9230-7d27f16afbb6) [augmented reality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/abdc7ac8-151f-40c6-bc1a-1e9b4b073290) [object-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5be3d306-6cf1-4b49-aa1d-01651dd4ba4c) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6) [web application security threats](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/902fb91c-3113-4004-9b4f-79aa86b638b7)

**Essential Skills and Competences**

[apply tools for content development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/37a438f3-e28c-4e32-83c5-299f047c1dc9) [compile content](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/96a67da1-881f-4d09-927e-ac75fcff4d93) [comply with legal regulations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3d3ee5c3-4286-457f-9f76-1704011f7e11) [conduct content quality assurance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/29154735-107a-4daa-a050-537f7707f34e) [conduct search engine optimisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a0bf9b9d-e53f-418c-a839-5d99eff718fe) [create content title](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/df996a98-202f-4a9b-b088-38c8db03ef1b) [ensure compliance with company regulations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4cb51222-3e2e-417c-9a5c-e9ccf262721d) [ensure compliance with legal requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1dae8445-12e5-423a-bb26-824010e299b9) [identify customer requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e0c9c11-b39e-43cf-ba95-2fe646f5de64) [identify legal requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9bf9e17-ae47-417b-bbb1-e8b7c263ccac) [integrate content into output media](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c0e2f74c-51f0-4020-9756-d190848cf181) [interpret technical texts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85c11255-469f-41bd-a6d1-382bc4a87783) [manage content metadata](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9710092c-f174-4e84-95bf-2064d39ad7a0) [manage online content](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c1f29568-f2bb-49d2-b6c2-28748bd1629b) [provide multimedia content](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dfb9cec6-3ae3-408a-9d57-c44361bf7aaf) [provide written content](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be40c4c3-a855-4d67-9ca5-6f4428c34b0d) [translate requirement concepts into content](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0dcbf7c5-bedf-4485-b16b-23df54443864) [translate requirements into visual design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2d6d4784-0992-48e7-b100-22d7229b3f0a) [use content management system software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a10e3e-c9e7-4d39-b6f1-6013398fcb3a) [use markup languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0af062de-eb43-41e9-9b96-249e2cd22d26) [utilise content types](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7234e847-451d-499a-9c7b-0050a4e758d6)

**Essential Knowledge**

[authoring software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d4789070-2ff7-4bbb-94ca-8bb1739826a9) [content development processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e74f4f21-8d45-412c-b5c3-652e6167ee32) [information structure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03ff0d53-573a-47a0-a0ad-1995815a4339) [keywords in digital content](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/06f33d6a-f7a7-4a2b-baa5-8c3c53bd1a9c) [legal requirements of ICT products](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a846cb9e-c152-41e7-bd34-45e7ff941e3b) [publishing strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d6c29154-9cc1-48a4-a2de-3d1d0d7f0831) [style sheet languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c2999f0c-eb37-4cdf-b9b0-82107b628794) [web programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69bbd53f-fbb0-4476-b4b2-ef7844464e28)

**Optional Skills and Competences**

[design digital call to action](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5233e3f4-904a-4f68-9327-707f11d93374) [ensure proper document management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c241f5a5-e23f-47bf-ad24-d83ea0010166) [manage content development projects](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ac516e9b-8bfa-4b72-8e3e-340b0a3a51d5) [perform copywriting](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ce592b28-4467-4908-b2e6-64bbe18da631) [perform online data analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/062320e5-79d1-45e8-8b7e-5deeb53279a2) [proofread text](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/637ca2e2-0624-48b1-be6e-9ff4580344ac) [provide guidelines for content development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b63ba4e4-ebf4-4e17-b0d6-662244022a4f) [use presentation software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/234aeb8d-56c3-4531-9193-1c5e6a8d16cb) [use spreadsheets software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1973c966-f236-40c9-b2d4-5d71a89019be) [use word processing software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/81633a44-f1db-4a01-a940-804c6905e330)

**Optional Knowledge**

[AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [CSS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5d1f825-60ed-4bdd-872a-e748c387f777) [JSSS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8785ccda-6f9f-4cf3-9033-fda10653d0be) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [LESS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/26fa7a33-a426-4cd5-9792-33bf668612e1) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Sass](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1110c92f-3059-445a-9436-0f4200d365f5) [World Wide Web Consortium standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8696aff0-18c0-4ba6-a4d0-9a21861b3e5e) [augmented reality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/abdc7ac8-151f-40c6-bc1a-1e9b4b073290) [cognitive psychology](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2618f336-8e71-4666-83b5-f368edb0906d) [content marketing strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b0560439-14eb-41d1-aa53-1938efc24123)

**Essential Skills and Competences**

[assess users' interaction with ICT applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/465e7c78-cd26-4503-a5ca-40009e807705) [build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [create website wireframe](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f0f5bb34-71df-4715-9c9e-03567b76ec8f) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [design graphics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f058bf62-70d1-4f5e-be2a-8b26fac24a96) [design process](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c28fc20-8a60-4311-8899-5ef8729c05b3) [design user interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd33c66c-70c4-40e6-b87c-5495bd3bf26e) [develop creative ideas](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c4c49d4-9708-433f-8ca7-bf2c5211ee49) [draw design sketches](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fc4fcb4b-993f-4f2c-b158-c2171ec18ed8) [interact with users to gather requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a8797f21-1af0-4c5e-98ca-bf1442929363) [manage online content](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c1f29568-f2bb-49d2-b6c2-28748bd1629b) [test system accessibility for users with special needs](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be64bb4c-84ac-4c83-8cc7-fc8593e15136) [translate requirements into visual design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2d6d4784-0992-48e7-b100-22d7229b3f0a) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use markup languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0af062de-eb43-41e9-9b96-249e2cd22d26) [use methodologies for user-centered design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7364cc39-b9c0-449f-9416-57723e2fd9c4)

**Essential Knowledge**

[ICT accessibility standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3e23db60-0c3d-498a-a6ac-ffbed0ecb033) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [World Wide Web Consortium standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8696aff0-18c0-4ba6-a4d0-9a21861b3e5e) [application usability](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c4b626c1-e71c-44ec-9f88-042766f37fcc) [graphics editor software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a71577b2-7550-4222-88ee-dcbd2d881516) [human-computer interaction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9136cbf1-7916-4f1c-bc9a-0318ee1d6016) [software UI design patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1019423b-3368-4f83-b24f-19e5fa23e816) [software interaction design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/de0be6e8-644c-4cc9-9c8d-925dd98dda56) [task algorithmisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7482a123-e801-48de-9733-262125671410) [web programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69bbd53f-fbb0-4476-b4b2-ef7844464e28)

**Optional Skills and Competences**

[analyse business requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17) [create software design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3bddfd7c-ab6d-40c2-883d-5e97fb7640ba) [manage localisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a9bf8565-8a09-4118-9922-932d65a79d69) [perform online data analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/062320e5-79d1-45e8-8b7e-5deeb53279a2) [use query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75f839c2-fd9a-4ad3-8921-6e734608568d)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Adobe Illustrator](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/27b913f0-3c52-448b-ad27-fc6ef08fb326) [Adobe Photoshop](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14ced458-5f4b-495f-bd3d-9c240614bda0) [Agile development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dba46f87-0831-49cd-a1c7-340a653c0221) [Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [DevOps](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f0de4973-0a70-4644-8fd4-3a97080476f4) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [GIMP (graphics editor software)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4a466c62-db7d-4905-9a41-f23214810acb) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [Incremental development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/00c04e40-35ea-4ed1-824c-82f936c8f876) [Iterative development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/33d49d4f-31ec-473f-9b8a-b555aa5116bb) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visio](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/86f7126d-97fd-4da5-be96-d1cf6ecd54e6) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Prototyping development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed1d8bd4-cd2a-4c64-b665-56d70651026c) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Rapid application development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/96eb286a-58b7-45ff-a916-5578d0b79b8c) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [SketchBook Pro](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85038d57-1fdd-40de-b908-2c005545a8c3) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Spiral development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4840338b-ac6c-486a-be1d-9ddfe00b8bdf) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [Synfig](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b0ac313d-de44-4344-ada6-76d2177b6d92) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [Waterfall development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a876489-7ad8-4a13-b09c-c9b8e97a302e) [augmented reality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/abdc7ac8-151f-40c6-bc1a-1e9b4b073290) [business process modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/98301d4a-2cc3-439d-8d7f-0b6ac76302bb) [cognitive psychology](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2618f336-8e71-4666-83b5-f368edb0906d) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [natural language processing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fff0e2cd-d0bd-4b02-9daf-158b79d9688a) [quality standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8d4271ca-c9fd-40b3-875f-15f78332a49e) [software design methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8ff015a0-98ea-4d80-a23e-1f68110a919e)

**Essential Skills and Competences**

[apply social media marketing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/64e09849-a7db-4d6b-a932-66264420eb97) [conduct search engine optimisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a0bf9b9d-e53f-418c-a839-5d99eff718fe) [enhance website visibility](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ef64005d-75bc-4597-8ed6-717edec5e55e) [integrate content into output media](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c0e2f74c-51f0-4020-9756-d190848cf181) [manage content development projects](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ac516e9b-8bfa-4b72-8e3e-340b0a3a51d5) [perform online data analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/062320e5-79d1-45e8-8b7e-5deeb53279a2) [provide written content](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be40c4c3-a855-4d67-9ca5-6f4428c34b0d) [use customer relationship management software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9889b795-d755-41b2-8afd-2e3c87a65a38)

**Essential Knowledge**

[content marketing strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b0560439-14eb-41d1-aa53-1938efc24123) [keywords in digital content](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/06f33d6a-f7a7-4a2b-baa5-8c3c53bd1a9c) [sales strategies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e7219848-a27a-4bf4-8775-d367707be7c9) [social media marketing techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/509909a2-4a8f-4ead-8ad0-968df63b77cc) [web analytics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1605025e-a179-421f-8f35-5b07d182a6b2)

**Optional Skills and Competences**

[create content title](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/df996a98-202f-4a9b-b088-38c8db03ef1b) [execute email marketing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/36931cb7-ca3f-4be1-8428-f38eefc8e1ed) [identify ICT user needs](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ddfe79e2-c2e3-4ba7-9bdf-3820b4f75b54) [perform market research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fe39d4db-4cb5-4299-bb9f-896c8fd6ab13) [plan digital marketing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/736ef286-fbd3-4e5c-a4b4-d1e2008c9898) [provide cost benefit analysis reports](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/48b68726-0fd6-4e03-a5eb-82236516ee7a) [study website behaviour patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6fe76a8b-4d5f-4cea-b76b-5908463fb014) [translate requirements into visual design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2d6d4784-0992-48e7-b100-22d7229b3f0a) [use content management system software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a10e3e-c9e7-4d39-b6f1-6013398fcb3a) [use different communication channels](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/415abd43-e8e5-4643-b5da-5f11307af57a)

**Optional Knowledge**

[behavioural science](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/269b8734-fa1d-4c6f-a843-523fa3bbae6e) [digital marketing techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/43dfbe7f-9e10-4871-b171-e5076737b4cf) [mobile marketing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ef069fe6-305b-4452-8f7d-0c572e98effc)

**Essential Skills and Competences**

[analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [apply 3D imaging techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1859883d-c047-4fe1-8e74-7bb4385d6ad2) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [execute analytical mathematical calculations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/31c69100-b612-4a61-8db5-fd314318854c) [interpret technical texts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85c11255-469f-41bd-a6d1-382bc4a87783) [render 3D images](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8171178-9a60-40a6-ad3b-510e10cfebad) [use software design patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b7a79e5-84d8-4880-be66-3d9bb05bea17) [use software libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8b94aa1e-89c9-459d-b3b4-1dfab8dec2df) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Essential Knowledge**

[3D lighting](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6e53fd99-b646-4327-9580-ac062ab21188) [3D texturing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3e7516dc-0f7c-4686-8b2f-fade4e5d21be) [ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [digital game genres](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e361e34-c563-4892-b9d3-873a6a4fef8a) [integrated development environment software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/925463a7-d51f-4d5b-9f79-4d28cf30acde) [tools for software configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2e926f-53d9-41f5-98f3-19dfaa687f3f)

**Optional Skills and Competences**

[adapt to changes in technological development plans](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5308e60-d763-4ead-be95-88c96fb3e02b) [create flowchart diagram](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/901105f8-3a08-453e-b1dc-23619e317fd3) [design user interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd33c66c-70c4-40e6-b87c-5495bd3bf26e) [develop creative ideas](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c4c49d4-9708-433f-8ca7-bf2c5211ee49) [develop virtual game engine](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7d5ff73e-7bea-436d-974f-3a51ce24a138) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [use automatic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7d10fcb2-b368-48ab-996b-7c9fafcf68ed) [use concurrent programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25b291b5-8245-4d9d-b391-86a8a31d7109) [use functional programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d31fab87-2a7d-485c-b699-2901ca294b15) [use logic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c4e11ef-da18-4e19-816b-e6bc19e12424) [use object-oriented programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5b9cde20-f1b9-4adc-bfb3-dbf70b14138d)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Ansible](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f8a40d6-f9ce-43ec-a72f-d4213a53f3ed) [Apache Maven](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d168770-4d9c-4096-b048-a6577818d306) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Eclipse (integrated development environment software)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b6a9252-2ed7-4862-a02f-1578f4a532ea) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [Internet of Things](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f049d050-12da-4e40-813a-2b5eb6df6b51) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Jenkins (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f47a1998-0beb-43be-9f46-380aa4d183da) [KDevelop](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/013441c1-1f13-47e9-80c4-9a53e8e1bc05) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Puppet (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6417a4cc-6f61-4459-a114-761a7fa0279d) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [STAF](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f0167e-75d9-46cf-847f-72a592880ebb) [Salt (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7451027-8249-405a-bb1b-342ff0f3fb3b) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [World Wide Web Consortium standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8696aff0-18c0-4ba6-a4d0-9a21861b3e5e) [Xcode](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/449d119b-2d66-43a9-9230-7d27f16afbb6) [augmented reality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/abdc7ac8-151f-40c6-bc1a-1e9b4b073290) [object-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5be3d306-6cf1-4b49-aa1d-01651dd4ba4c) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6) [trigonometry](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8a16add0-6faa-4387-896c-ee641568d89f)

**Essential Skills and Competences**

[analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [design graphics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f058bf62-70d1-4f5e-be2a-8b26fac24a96) [design user interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd33c66c-70c4-40e6-b87c-5495bd3bf26e) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [draw design sketches](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fc4fcb4b-993f-4f2c-b158-c2171ec18ed8) [interpret technical texts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85c11255-469f-41bd-a6d1-382bc4a87783) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use methodologies for user-centered design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7364cc39-b9c0-449f-9416-57723e2fd9c4) [use software design patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b7a79e5-84d8-4880-be66-3d9bb05bea17) [use software libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8b94aa1e-89c9-459d-b3b4-1dfab8dec2df)

**Essential Knowledge**

[World Wide Web Consortium standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8696aff0-18c0-4ba6-a4d0-9a21861b3e5e) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [graphics editor software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a71577b2-7550-4222-88ee-dcbd2d881516) [integrated development environment software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/925463a7-d51f-4d5b-9f79-4d28cf30acde) [software UI design patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1019423b-3368-4f83-b24f-19e5fa23e816) [style sheet languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c2999f0c-eb37-4cdf-b9b0-82107b628794) [web programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69bbd53f-fbb0-4476-b4b2-ef7844464e28)

**Optional Skills and Competences**

[create flowchart diagram](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/901105f8-3a08-453e-b1dc-23619e317fd3) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [design interaction model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/12274664-b642-4945-b88f-d7787dc3c9dd) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [use automatic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7d10fcb2-b368-48ab-996b-7c9fafcf68ed) [use concurrent programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25b291b5-8245-4d9d-b391-86a8a31d7109) [use functional programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d31fab87-2a7d-485c-b699-2901ca294b15) [use logic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c4e11ef-da18-4e19-816b-e6bc19e12424) [use markup languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0af062de-eb43-41e9-9b96-249e2cd22d26) [use object-oriented programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5b9cde20-f1b9-4adc-bfb3-dbf70b14138d) [use query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75f839c2-fd9a-4ad3-8921-6e734608568d) [use scripting programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5ef0c719-5bcb-49f8-b8eb-824388225333) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Adobe Illustrator](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/27b913f0-3c52-448b-ad27-fc6ef08fb326) [Adobe Photoshop](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14ced458-5f4b-495f-bd3d-9c240614bda0) [Ajax Framework](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c88d336-c249-4537-b26e-d679a85c4b9b) [Ansible](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f8a40d6-f9ce-43ec-a72f-d4213a53f3ed) [Apache Maven](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d168770-4d9c-4096-b048-a6577818d306) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CSS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5d1f825-60ed-4bdd-872a-e748c387f777) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Drupal](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1de3942b-99d8-41e8-9ef0-fbc9e9f6307b) [Eclipse (integrated development environment software)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b6a9252-2ed7-4862-a02f-1578f4a532ea) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [GIMP (graphics editor software)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4a466c62-db7d-4905-9a41-f23214810acb) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [ICT project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/94dd823c-148e-4614-a6e8-99249b16357d) [JSSS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8785ccda-6f9f-4cf3-9033-fda10653d0be) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [JavaScript Framework](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9b9de2a4-d8af-4a7b-933a-a8334ae60067) [Jenkins (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f47a1998-0beb-43be-9f46-380aa4d183da) [KDevelop](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/013441c1-1f13-47e9-80c4-9a53e8e1bc05) [LESS](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/26fa7a33-a426-4cd5-9792-33bf668612e1) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visio](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/86f7126d-97fd-4da5-be96-d1cf6ecd54e6) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [NoSQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/76ef6ed3-1658-4a1a-9593-204d799c6d0c) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Puppet (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6417a4cc-6f61-4459-a114-761a7fa0279d) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [STAF](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f0167e-75d9-46cf-847f-72a592880ebb) [Salt (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7451027-8249-405a-bb1b-342ff0f3fb3b) [Sass](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1110c92f-3059-445a-9436-0f4200d365f5) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [SketchBook Pro](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85038d57-1fdd-40de-b908-2c005545a8c3) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [Synfig](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b0ac313d-de44-4344-ada6-76d2177b6d92) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Vagrant](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b3afb82-c4ea-4f14-be54-a757fb762663) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [WordPress](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6d289e8b-2cc1-4eda-ab1f-ad1090ef98f0) [Xcode](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/449d119b-2d66-43a9-9230-7d27f16afbb6) [augmented reality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/abdc7ac8-151f-40c6-bc1a-1e9b4b073290) [human-computer interaction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9136cbf1-7916-4f1c-bc9a-0318ee1d6016) [software interaction design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/de0be6e8-644c-4cc9-9c8d-925dd98dda56) [tools for software configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2e926f-53d9-41f5-98f3-19dfaa687f3f)

**Essential Skills and Competences**

[debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [interpret technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be48353d-25c7-4f86-bea9-7b9e248fbc6e) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [use software design patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b7a79e5-84d8-4880-be66-3d9bb05bea17) [use software libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8b94aa1e-89c9-459d-b3b4-1dfab8dec2df) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Essential Knowledge**

[ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [blockchain consensus mechanisms](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f7e051fc-8f7b-45b3-8911-8ffb9b951f4a) [blockchain openness](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3c2e6f38-42c1-46ec-b782-5854b2db330d) [blockchain platforms](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9035afc4-5317-455d-ab60-f32e2ecc6bfc) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [decentralized application frameworks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/251b5528-693c-4ef9-a7f6-9924bb8d7ef8) [principles of distributed ledger technology](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3be79ccc-a455-49b9-8c65-55c50071ba5b) [smart contract](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/670f8eea-f25b-4c3f-97ef-a4729d4c63d6) [software components libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/484df271-bb52-49f1-8f50-f19624bf4df2)

**Optional Skills and Competences**

[adapt to changes in technological development plans](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5308e60-d763-4ead-be95-88c96fb3e02b) [design user interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd33c66c-70c4-40e6-b87c-5495bd3bf26e) [implement front-end website design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c4b1f326-224a-420a-b8b3-814a8f13b6cb) [use markup languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0af062de-eb43-41e9-9b96-249e2cd22d26)

**Optional Knowledge**

[Angular](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1ffac4ac-fda7-407d-8ed1-ca8f4a8dc146) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [ICT encryption](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d32db06e-bd06-4415-a7ab-1b0ee68caa9a) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [SaaS (service-oriented modelling)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eeca3780-8049-499f-a268-95a7ad26642c) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Solidity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/605399ce-4736-4b41-b41e-92ecf2139454) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [Vyper](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/53780150-1581-4ae6-b435-34068c172caf) [cloud technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd14968e-e409-45af-b362-3495ed7b10e0) [data analytics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/97bd1c21-66b2-4b7e-ad0f-e3cda590e378)

**Essential Skills and Competences**

[analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [create flowchart diagram](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/901105f8-3a08-453e-b1dc-23619e317fd3) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [develop automated migration methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0b0335f3-0aa1-491e-895e-81fc8774a300) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [identify customer requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e0c9c11-b39e-43cf-ba95-2fe646f5de64) [interpret technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be48353d-25c7-4f86-bea9-7b9e248fbc6e) [manage engineering project](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a899482-8bcf-40ca-ae67-579a1cc467ab) [perform scientific research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4fabca9a-7435-4f33-b1da-3cdb00340fdc) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use software design patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b7a79e5-84d8-4880-be66-3d9bb05bea17) [use software libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8b94aa1e-89c9-459d-b3b4-1dfab8dec2df) [use technical drawing software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/541561bc-510c-4a99-881c-2d8bf5a85462) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Essential Knowledge**

[ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [engineering principles](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/209a5498-3449-4689-8ed9-bd08cab4fd78) [engineering processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/72a74f69-5cf1-43c5-99b9-62a444578919) [integrated development environment software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/925463a7-d51f-4d5b-9f79-4d28cf30acde) [project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7111b95d-0ce3-441a-9d92-4c75d05c4388) [technical drawings](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/59ea80e1-463a-4dba-82c6-d0b6d577d532) [tools for software configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2e926f-53d9-41f5-98f3-19dfaa687f3f)

**Optional Skills and Competences**

[adapt to changes in technological development plans](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5308e60-d763-4ead-be95-88c96fb3e02b) [collect customer feedback on applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71746a0b-e58d-4dc4-ad03-bd84082eae21) [design user interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd33c66c-70c4-40e6-b87c-5495bd3bf26e) [develop creative ideas](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c4c49d4-9708-433f-8ca7-bf2c5211ee49) [do cloud refactoring](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/38716afc-a93b-44ab-96cc-2ecf67edcf32) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [migrate existing data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/020918ef-4b55-47c1-8430-ab7b8f6a7377) [use automatic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7d10fcb2-b368-48ab-996b-7c9fafcf68ed) [use concurrent programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25b291b5-8245-4d9d-b391-86a8a31d7109) [use functional programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d31fab87-2a7d-485c-b699-2901ca294b15) [use logic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c4e11ef-da18-4e19-816b-e6bc19e12424) [use object-oriented programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5b9cde20-f1b9-4adc-bfb3-dbf70b14138d) [use query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75f839c2-fd9a-4ad3-8921-6e734608568d) [utilise machine learning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369c2d6-c100-4cf6-bd83-9668d8678433)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Ajax Framework](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c88d336-c249-4537-b26e-d679a85c4b9b) [Ansible](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f8a40d6-f9ce-43ec-a72f-d4213a53f3ed) [Apache Maven](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d168770-4d9c-4096-b048-a6577818d306) [Apache Tomcat](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0fb753a1-2ef2-4429-84d2-ecb2b24daf7a) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Drupal](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1de3942b-99d8-41e8-9ef0-fbc9e9f6307b) [Eclipse (integrated development environment software)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b6a9252-2ed7-4862-a02f-1578f4a532ea) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [IBM WebSphere](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4e31589-3632-4926-91d0-15b889c90b9b) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [Internet of Things](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f049d050-12da-4e40-813a-2b5eb6df6b51) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [JavaScript Framework](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9b9de2a4-d8af-4a7b-933a-a8334ae60067) [Jenkins (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f47a1998-0beb-43be-9f46-380aa4d183da) [KDevelop](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/013441c1-1f13-47e9-80c4-9a53e8e1bc05) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [NoSQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/76ef6ed3-1658-4a1a-9593-204d799c6d0c) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [Oracle Application Development Framework](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8764d4b1-e069-44f2-8baa-fb1eee1850ec) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Puppet (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6417a4cc-6f61-4459-a114-761a7fa0279d) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [SQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/598de5b0-5b58-4ea7-8058-a4bc4d18c742) [STAF](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f0167e-75d9-46cf-847f-72a592880ebb) [Salt (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7451027-8249-405a-bb1b-342ff0f3fb3b) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [WordPress](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6d289e8b-2cc1-4eda-ab1f-ad1090ef98f0) [World Wide Web Consortium standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8696aff0-18c0-4ba6-a4d0-9a21861b3e5e) [Xcode](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/449d119b-2d66-43a9-9230-7d27f16afbb6) [blockchain openness](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3c2e6f38-42c1-46ec-b782-5854b2db330d) [blockchain platforms](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9035afc4-5317-455d-ab60-f32e2ecc6bfc) [cyber attack counter-measures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5898d99a-62a4-4e10-a2e3-0d815ce44248) [defence standard procedures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/17924c75-45f4-4593-afac-eea0d51f04b5) [object-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5be3d306-6cf1-4b49-aa1d-01651dd4ba4c) [smart contract](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/670f8eea-f25b-4c3f-97ef-a4729d4c63d6) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6) [software frameworks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/24c200e5-be20-4370-a137-ab53797f3a17)

**Essential Skills and Competences**

[align software with system architectures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2857540c-180b-4208-9127-e94a01871966) [analyse business requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17) [analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [collect customer feedback on applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71746a0b-e58d-4dc4-ad03-bd84082eae21) [create flowchart diagram](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/901105f8-3a08-453e-b1dc-23619e317fd3) [create software design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3bddfd7c-ab6d-40c2-883d-5e97fb7640ba) [define software architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f7e2eb04-3e50-4561-bce1-7e51a1fec308) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [design process](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c28fc20-8a60-4311-8899-5ef8729c05b3) [oversee development of software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/83b33952-3872-46ec-9a2e-b28f91303a7e) [provide cost benefit analysis reports](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/48b68726-0fd6-4e03-a5eb-82236516ee7a) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9)

**Essential Knowledge**

[business process modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/98301d4a-2cc3-439d-8d7f-0b6ac76302bb) [object-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5be3d306-6cf1-4b49-aa1d-01651dd4ba4c) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575) [tools for software configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2e926f-53d9-41f5-98f3-19dfaa687f3f) [unified modelling language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7193cb6d-8334-494f-86e5-21e6d03a47c3)

**Optional Skills and Competences**

[apply ICT systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cbe2c304-1e7d-489a-97d9-a7d3e37a9db6) [design cloud architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11430d93-c835-48ed-8e70-285fa69c9ae6) [design database in the cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e796b51-49d7-4e73-95af-2e7323763f15) [design database scheme](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6c08403c-a5bb-4868-b8c2-b7d039c0e511) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [do cloud refactoring](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/38716afc-a93b-44ab-96cc-2ecf67edcf32) [implement data warehousing techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd6d2981-3d4a-4ce2-9741-cfc98c5b74bd) [manage staff](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/339ac029-066a-4985-9f9d-b3d7c8fea0bb) [perform ICT troubleshooting](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/744442ac-c157-4350-8be0-ce454df4f5c5) [perform resource planning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5dd06b8-5d17-4932-9d03-957d0c4f5051) [perform risk analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1dd23dba-dd00-45ab-abf4-642902538317) [provide ICT consulting advice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/283cbcd3-7101-4dbb-be37-56f3625515b1) [use markup languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0af062de-eb43-41e9-9b96-249e2cd22d26) [use query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75f839c2-fd9a-4ad3-8921-6e734608568d) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [Ansible](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f8a40d6-f9ce-43ec-a72f-d4213a53f3ed) [Apache Maven](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d168770-4d9c-4096-b048-a6577818d306) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Jboss](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b16bcbcb-1d3f-42b3-a6a5-b91348a72b70) [Jenkins (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f47a1998-0beb-43be-9f46-380aa4d183da) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Puppet (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6417a4cc-6f61-4459-a114-761a7fa0279d) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [STAF](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f0167e-75d9-46cf-847f-72a592880ebb) [Salt (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7451027-8249-405a-bb1b-342ff0f3fb3b) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cdd8b6b2-2fd9-453c-8d62-8a1dc6efcd49) [task algorithmisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7482a123-e801-48de-9733-262125671410) [web programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69bbd53f-fbb0-4476-b4b2-ef7844464e28)

**Essential Skills and Competences**

[align software with system architectures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2857540c-180b-4208-9127-e94a01871966) [analyse business requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17) [analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [collect customer feedback on applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71746a0b-e58d-4dc4-ad03-bd84082eae21) [create flowchart diagram](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/901105f8-3a08-453e-b1dc-23619e317fd3) [create software design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3bddfd7c-ab6d-40c2-883d-5e97fb7640ba) [define software architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f7e2eb04-3e50-4561-bce1-7e51a1fec308) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [design process](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c28fc20-8a60-4311-8899-5ef8729c05b3) [oversee development of software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/83b33952-3872-46ec-9a2e-b28f91303a7e) [provide cost benefit analysis reports](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/48b68726-0fd6-4e03-a5eb-82236516ee7a) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9)

**Essential Knowledge**

[business process modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/98301d4a-2cc3-439d-8d7f-0b6ac76302bb) [object-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5be3d306-6cf1-4b49-aa1d-01651dd4ba4c) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575) [tools for software configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2e926f-53d9-41f5-98f3-19dfaa687f3f) [unified modelling language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7193cb6d-8334-494f-86e5-21e6d03a47c3)

**Optional Skills and Competences**

[apply ICT systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cbe2c304-1e7d-489a-97d9-a7d3e37a9db6) [design cloud architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11430d93-c835-48ed-8e70-285fa69c9ae6) [design database in the cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e796b51-49d7-4e73-95af-2e7323763f15) [design database scheme](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6c08403c-a5bb-4868-b8c2-b7d039c0e511) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [do cloud refactoring](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/38716afc-a93b-44ab-96cc-2ecf67edcf32) [implement data warehousing techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd6d2981-3d4a-4ce2-9741-cfc98c5b74bd) [manage staff](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/339ac029-066a-4985-9f9d-b3d7c8fea0bb) [perform ICT troubleshooting](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/744442ac-c157-4350-8be0-ce454df4f5c5) [perform resource planning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5dd06b8-5d17-4932-9d03-957d0c4f5051) [perform risk analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1dd23dba-dd00-45ab-abf4-642902538317) [provide ICT consulting advice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/283cbcd3-7101-4dbb-be37-56f3625515b1) [use markup languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0af062de-eb43-41e9-9b96-249e2cd22d26) [use query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75f839c2-fd9a-4ad3-8921-6e734608568d) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [Ansible](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f8a40d6-f9ce-43ec-a72f-d4213a53f3ed) [Apache Maven](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d168770-4d9c-4096-b048-a6577818d306) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Jboss](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b16bcbcb-1d3f-42b3-a6a5-b91348a72b70) [Jenkins (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f47a1998-0beb-43be-9f46-380aa4d183da) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Puppet (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6417a4cc-6f61-4459-a114-761a7fa0279d) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [STAF](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f0167e-75d9-46cf-847f-72a592880ebb) [Salt (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7451027-8249-405a-bb1b-342ff0f3fb3b) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cdd8b6b2-2fd9-453c-8d62-8a1dc6efcd49) [task algorithmisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7482a123-e801-48de-9733-262125671410) [web programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69bbd53f-fbb0-4476-b4b2-ef7844464e28)

**Essential Skills and Competences**

[align software with system architectures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2857540c-180b-4208-9127-e94a01871966) [analyse business requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17) [analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [automate cloud tasks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ce8ae6ca-61d8-4174-b457-641de96cbff4) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [deploy cloud resource](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6195c5f7-a4fb-425d-a3dd-c4467c4471a3) [design cloud architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11430d93-c835-48ed-8e70-285fa69c9ae6) [design cloud networks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4da4587a-fd0b-4ca2-886c-c42a1562d432) [design database in the cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e796b51-49d7-4e73-95af-2e7323763f15) [design for organisational complexity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dfff95c6-9758-4c04-a228-7eaa88dec6cd) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [develop with cloud services](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b643893-0a1f-4f6c-83a1-e7eef75849b9) [do cloud refactoring](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/38716afc-a93b-44ab-96cc-2ecf67edcf32) [interpret technical texts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85c11255-469f-41bd-a6d1-382bc4a87783) [manage cloud data and storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d3286405-49f8-4e8a-8046-a4376b4e7963) [manage keys for data protection](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5beeff8-7c98-490a-ae2c-16fbb6a87305) [plan migration to cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a52bed5-fd29-45fb-aba6-e32bccfda1c1) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [respond to incidents in cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/440d5784-52a5-4729-8b04-29f978bd896d) [solve ICT system problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9e06bac6-6b91-48ca-8b7d-c1f48cdecd7c)

**Essential Knowledge**

[ICT system integration](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6fa1c2c0-a012-4ca0-9642-e01569ba322c) [ICT system programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b105ec9b-0857-41d6-8d07-a83e58b73d90) [SaaS (service-oriented modelling)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eeca3780-8049-499f-a268-95a7ad26642c) [cloud monitoring and reporting](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8efa6a7a-6556-4cb8-908d-59d3b5c58d2f) [cloud security and compliance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1c2978b8-bb0d-4249-9c23-877571a4dffa) [cloud technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd14968e-e409-45af-b362-3495ed7b10e0) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [cyber security](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8088750d-8388-4170-a76f-48354c469c44) [database development tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ef0f3a0-9ce2-4ef1-a987-0366b5cb2dbe) [implement cloud security and compliance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c13fb093-5ffb-491a-b8b7-fa2d42a57e2e) [operating systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f9a6f35b-01a7-40c9-8b61-b6ee46f97272) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575) [systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cdd8b6b2-2fd9-453c-8d62-8a1dc6efcd49)

**Optional Skills and Competences**

[apply ICT systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cbe2c304-1e7d-489a-97d9-a7d3e37a9db6) [apply risk management processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/96550830-539b-4746-96aa-92aa4959945d) [design interaction model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/12274664-b642-4945-b88f-d7787dc3c9dd) [perform data analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b92a5b2-6758-4ee3-9fb4-b6387a55cc8f) [use query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75f839c2-fd9a-4ad3-8921-6e734608568d)

**Optional Knowledge**

[ICT security standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ff589b7-68df-4ea5-ae41-b395bdb2378f) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [ethics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cef5c0f8-1e40-4c09-b6a7-aa7811849e5d)

**Essential Skills and Competences**

[analyse business requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17) [assess users' interaction with ICT applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/465e7c78-cd26-4503-a5ca-40009e807705) [conduct qualitative research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fa465db3-56e8-4b5d-a781-e2a313a4ed2d) [conduct quantitative research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8316979b-df5a-4dc7-98ef-61ec6a10df84) [conduct research interview](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/896563fc-6255-4419-89c2-ffed30159ad6) [create prototype of user experience solutions](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/07dd856d-6141-48a7-a228-918f88494812) [execute ICT user research activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4c2aa71-086f-4a46-b481-2619673c9dfe) [measure customer feedback](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/89ba58e8-a67e-4d2b-ad42-6acab25c241b) [measure software usability](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be0ff6d8-5e61-4021-9c89-e40cf0b75cc6) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [report analysis results](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c544a9f3-5945-4b54-afed-de0697852817) [use experience map](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0737ad0a-75ac-4696-988b-565820577ac0)

**Essential Knowledge**

[application usability](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c4b626c1-e71c-44ec-9f88-042766f37fcc) [behavioural science](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/269b8734-fa1d-4c6f-a843-523fa3bbae6e) [cognitive psychology](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2618f336-8e71-4666-83b5-f368edb0906d) [human-computer interaction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9136cbf1-7916-4f1c-bc9a-0318ee1d6016) [software interaction design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/de0be6e8-644c-4cc9-9c8d-925dd98dda56)

**Optional Skills and Competences**

[apply systemic design thinking](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4d30ad07-9e39-4899-81dd-02b280f162f9) [create website wireframe](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f0f5bb34-71df-4715-9c9e-03567b76ec8f) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [forecast future ICT network needs](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8fa840f7-e66a-4370-8e6d-7d554260c31c) [identify ICT user needs](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ddfe79e2-c2e3-4ba7-9bdf-3820b4f75b54) [identify technological needs](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42fcf80d-7b45-40f3-bd2f-5411c4c0dfa0) [manage localisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a9bf8565-8a09-4118-9922-932d65a79d69) [perform market research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fe39d4db-4cb5-4299-bb9f-896c8fd6ab13) [test system accessibility for users with special needs](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be64bb4c-84ac-4c83-8cc7-fc8593e15136) [use access control software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da73370-f6b9-417d-a94c-09bf01f84aa2)

**Optional Knowledge**

[Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [ICT system user requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ca73ac82-867a-4afa-9732-834aebe896ff) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [World Wide Web Consortium standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8696aff0-18c0-4ba6-a4d0-9a21861b3e5e) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [online moderation techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c9b6aa32-6c42-4903-8e5a-23e43edf03fc) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [software metrics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fb7aee4d-f6c6-4a87-8e9d-8e542b3771f8) [visual presentation techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/348b74cd-49ce-4844-8bdf-ec188b497213) [web analytics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1605025e-a179-421f-8f35-5b07d182a6b2)

**Essential Skills and Competences**

[analyse ICT system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7adb8473-bcc6-4ff8-9850-76d945d40092) [develop audit plan](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed0718f6-5823-4c74-9749-2936c9c06203) [ensure adherence to organisational ICT standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b8271c8a-cba6-4baa-80f5-6361af3f07e3) [execute ICT audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e1f9657-ab4e-407c-842f-b846197060e3) [improve business processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75b30aeb-34c0-40f4-b77d-271d75a98b14) [perform ICT security testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f4a85869-1855-45d5-a43c-7ee8cd451996) [perform quality audits](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d83cba15-8511-4d07-b89a-9fde0d1d8241) [prepare financial auditing reports](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3e9b580d-811b-48df-a5d1-a7bdd26f901f)

**Essential Knowledge**

[ICT process quality models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fafe0b9d-dbd9-46bd-b770-26299539ce66) [ICT quality policy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3be6b84a-fa78-42b9-a8df-150cdb40b9d7) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [ICT security standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ff589b7-68df-4ea5-ae41-b395bdb2378f) [audit techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a536b36-c5c7-4d10-bf67-a4fb0f8549b2) [engineering processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/72a74f69-5cf1-43c5-99b9-62a444578919) [legal requirements of ICT products](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a846cb9e-c152-41e7-bd34-45e7ff941e3b) [organisational resilience](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/79f24a62-7718-46e1-9b41-37be0560a5ca) [product life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21e0cad8-4eef-42be-b18b-0f8e37f0dbd0) [quality standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8d4271ca-c9fd-40b3-875f-15f78332a49e) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575)

**Optional Skills and Competences**

[apply information security policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/86d2e2ea-1ba2-4aa6-b465-8a1f9abc81b8) [communicate analytical insights](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f263da7f-0708-42c2-b1a9-39083416f632) [define organisational standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d53b04fb-1bbb-4a25-92f8-8ceb308d276f) [develop ICT workflow](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/751941a0-5645-4f8b-b97e-b252909d5edb) [develop documentation in accordance with legal requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/695c3249-18e7-4435-bdb8-54a16011159d) [identify ICT security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fe1c2b32-7fe9-4668-affa-07ff658a68cf) [identify legal requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9bf9e17-ae47-417b-bbb1-e8b7c263ccac) [inform on safety standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/41437077-2522-49bf-bcb2-083a23d52958) [manage IT security compliances](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/06358891-8424-43c5-891e-d40f226bef40) [monitor technology trends](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7a17d7ce-01a2-4746-bbcc-22ffe22fa16e) [safeguard online privacy and identity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4b2a278-2123-4450-8b43-be01c4f341da)

**Optional Knowledge**

[ICT accessibility standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3e23db60-0c3d-498a-a6ac-ffbed0ecb033) [ICT network security risks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2ddb1226-1117-4eb4-ae65-3a2f5a5a3c80) [ICT project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/94dd823c-148e-4614-a6e8-99249b16357d) [World Wide Web Consortium standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8696aff0-18c0-4ba6-a4d0-9a21861b3e5e) [cloud technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd14968e-e409-45af-b362-3495ed7b10e0) [cyber security](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8088750d-8388-4170-a76f-48354c469c44) [information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11eebd42-44ab-401d-8a2c-bdb9fc9beb50)

**Essential Skills and Competences**

[analyse network bandwidth requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da042121-959d-451b-b4d0-3bbf07c1bc67) [apply ICT system usage policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9707091a-323b-4240-877a-5999a19286f0) [apply company policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a43729f-2a79-4dae-9faa-95520daae79f) [define integration strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4a882a1-0263-4dd2-b29a-f0028cac2393) [deploy ICT systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71c2f41e-14de-4b23-82ad-5dbcd54ba5b0) [design component interfaces](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f6868852-9bf6-4899-a5d6-5f9532fb877d) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [use scripting programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5ef0c719-5bcb-49f8-b8eb-824388225333)

**Essential Knowledge**

[ICT communications protocols](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6e4f75b4-c60f-4623-a9ba-760c8245753b) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [ICT system user requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ca73ac82-867a-4afa-9732-834aebe896ff) [hardware components suppliers](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed1fbdc3-1071-423c-9bb4-e3288ca6d1fe) [procurement of ICT network equipment](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/32428b21-514b-42c2-81b5-244a7804ea74) [software components suppliers](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e6b8f934-7f35-4dc6-9a64-f6c43acdc00b)

**Optional Skills and Competences**

[adapt to changing situations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5592ab32-4e7a-4cda-8e64-ca36d5de8a10) [communicate with customers](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0da516ee-e70e-4384-be13-f5ff80be8127) [design computer network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2164e860-7f20-48bc-b98c-5d9f8a561550) [implement a firewall](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5b5053e-0ef6-4c4e-a3f2-42f955f4322c) [implement anti-virus software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb2b4485-2bad-402f-8517-44bf7d9afff4) [perform project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd5efa8c-e44d-4cbc-91c6-796018dbed68) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use back-up and recovery tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/82de2df7-0d6c-42b1-94ac-b3e9a029e917) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [Ansible](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f8a40d6-f9ce-43ec-a72f-d4213a53f3ed) [Apache Maven](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d168770-4d9c-4096-b048-a6577818d306) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [Cisco](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/709ef32a-7435-48e2-8fa2-16e389ecab8a) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [ICT infrastructure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d0c6d77e-cb25-4770-bf77-2073fc5f7523) [ICT network routing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0da6cab1-0ee9-4391-a299-f71fbf21db56) [ICT recovery techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c9e96450-421d-48af-9ee6-d9c50e29afc2) [ICT system integration](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6fa1c2c0-a012-4ca0-9642-e01569ba322c) [ICT system programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b105ec9b-0857-41d6-8d07-a83e58b73d90) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Jenkins (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f47a1998-0beb-43be-9f46-380aa4d183da) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Puppet (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6417a4cc-6f61-4459-a114-761a7fa0279d) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [STAF](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f0167e-75d9-46cf-847f-72a592880ebb) [Salt (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7451027-8249-405a-bb1b-342ff0f3fb3b) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [Vagrant](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b3afb82-c4ea-4f14-be54-a757fb762663) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [embedded systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2180bd8c-86de-4889-8165-adac902eee9d) [engineering processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/72a74f69-5cf1-43c5-99b9-62a444578919) [hardware components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4b51e76e-9e8a-455f-a289-5b48246345c4) [information architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1bba98a7-92b9-450b-9235-e0c905f8f3c4) [information security strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11eebd42-44ab-401d-8a2c-bdb9fc9beb50) [interfacing techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/23b45aa6-a479-486d-9e6f-062cbab7c68a) [model based system engineering](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25df422a-bf0a-4f76-8631-d0be91cb8751) [software components libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/484df271-bb52-49f1-8f50-f19624bf4df2) [solution deployment](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1d86f05e-e9cc-40ce-99d8-2b21cc71b16b) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575) [tools for ICT test automation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7557f0f4-b8bc-4ac0-b91e-222ab1ba744f) [tools for software configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2e926f-53d9-41f5-98f3-19dfaa687f3f)

**Essential Skills and Competences**

[apply information security policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/86d2e2ea-1ba2-4aa6-b465-8a1f9abc81b8) [attend to ICT systems quality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7f0b1a66-ebaf-4c8a-b606-4c1844eb692e) [consult with business clients](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9531fe02-1e1f-4a36-95f7-a76a77cd4b8d) [define integration strategy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4a882a1-0263-4dd2-b29a-f0028cac2393) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [ensure proper document management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c241f5a5-e23f-47bf-ad24-d83ea0010166) [integrate ICT data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/46ec0033-3c71-415e-bcff-b065675ba2dc) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [keep up with the latest information systems solutions](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/20c920d4-7ff7-4676-ba61-3f04490d9416) [manage changes in ICT system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1e7ed56a-6d6b-422f-962e-38543d150755) [monitor system performance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9190d87f-9792-42e0-bb7f-64294a656bcd) [monitor technology trends](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7a17d7ce-01a2-4746-bbcc-22ffe22fa16e) [optimise choice of ICT solution](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cfa46e9-b7da-44ac-b09e-9596dffe0425) [provide ICT consulting advice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/283cbcd3-7101-4dbb-be37-56f3625515b1) [use scripting programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5ef0c719-5bcb-49f8-b8eb-824388225333) [verify formal ICT specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ee3b1553-2dc5-434b-8dcf-4ae3a40b3a48)

**Essential Knowledge**

[systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575)

**Optional Skills and Competences**

[build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [create project specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21fecc8a-392e-49ce-ac26-fb0696ccfead) [educate on data confidentiality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6aef2baa-5fa7-4c16-bd28-3e070ec4e4df) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [implement a firewall](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5b5053e-0ef6-4c4e-a3f2-42f955f4322c) [implement a virtual private network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/acf0a78c-f4e3-4bd9-a5cc-9cf4791b3b95) [manage ICT change request process](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a099c81-6a0c-4f00-bb3b-990d23ec03a5) [manage cloud data and storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d3286405-49f8-4e8a-8046-a4376b4e7963) [perform project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd5efa8c-e44d-4cbc-91c6-796018dbed68) [plan migration to cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a52bed5-fd29-45fb-aba6-e32bccfda1c1) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [track key performance indicators](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8dcbcabe-09f7-4d11-940d-125af57bbc40) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use back-up and recovery tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/82de2df7-0d6c-42b1-94ac-b3e9a029e917) [use different communication channels](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/415abd43-e8e5-4643-b5da-5f11307af57a) [write work-related reports](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/918f5211-b99f-4b29-9a34-6e475583ef55)

**Optional Knowledge**

[Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [ICT performance analysis methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed39edd3-44d0-4a16-9796-bfb99f92baf3) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [ICT system integration](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6fa1c2c0-a012-4ca0-9642-e01569ba322c) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [engineering processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/72a74f69-5cf1-43c5-99b9-62a444578919) [hardware components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4b51e76e-9e8a-455f-a289-5b48246345c4) [hardware components suppliers](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed1fbdc3-1071-423c-9bb4-e3288ca6d1fe) [information architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1bba98a7-92b9-450b-9235-e0c905f8f3c4) [model based system engineering](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25df422a-bf0a-4f76-8631-d0be91cb8751) [software components libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/484df271-bb52-49f1-8f50-f19624bf4df2) [software components suppliers](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e6b8f934-7f35-4dc6-9a64-f6c43acdc00b)

**Essential Skills and Competences**

[analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [collect customer feedback on applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71746a0b-e58d-4dc4-ad03-bd84082eae21) [create flowchart diagram](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/901105f8-3a08-453e-b1dc-23619e317fd3) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [develop automated migration methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0b0335f3-0aa1-491e-895e-81fc8774a300) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [interpret technical texts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85c11255-469f-41bd-a6d1-382bc4a87783) [keep up with the latest information systems solutions](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/20c920d4-7ff7-4676-ba61-3f04490d9416) [migrate existing data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/020918ef-4b55-47c1-8430-ab7b8f6a7377) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [solve ICT system problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9e06bac6-6b91-48ca-8b7d-c1f48cdecd7c) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use software design patterns](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b7a79e5-84d8-4880-be66-3d9bb05bea17) [use software libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8b94aa1e-89c9-459d-b3b4-1dfab8dec2df)

**Essential Knowledge**

[ICT debugging tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6014921e-1d25-4039-adc2-04852d61880e) [ICT system integration](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6fa1c2c0-a012-4ca0-9642-e01569ba322c) [ICT system programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b105ec9b-0857-41d6-8d07-a83e58b73d90) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [integrated development environment software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/925463a7-d51f-4d5b-9f79-4d28cf30acde) [tools for software configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2e926f-53d9-41f5-98f3-19dfaa687f3f)

**Optional Skills and Competences**

[adapt to changes in technological development plans](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5308e60-d763-4ead-be95-88c96fb3e02b) [apply ICT systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cbe2c304-1e7d-489a-97d9-a7d3e37a9db6) [automate cloud tasks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ce8ae6ca-61d8-4174-b457-641de96cbff4) [design cloud architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11430d93-c835-48ed-8e70-285fa69c9ae6) [design database scheme](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6c08403c-a5bb-4868-b8c2-b7d039c0e511) [design for organisational complexity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dfff95c6-9758-4c04-a228-7eaa88dec6cd) [design user interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd33c66c-70c4-40e6-b87c-5495bd3bf26e) [develop creative ideas](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c4c49d4-9708-433f-8ca7-bf2c5211ee49) [develop with cloud services](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b643893-0a1f-4f6c-83a1-e7eef75849b9) [identify ICT system weaknesses](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dad7e408-162f-46a4-8567-db560e19e2fc) [implement anti-virus software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb2b4485-2bad-402f-8517-44bf7d9afff4) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [monitor system performance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9190d87f-9792-42e0-bb7f-64294a656bcd) [plan migration to cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a52bed5-fd29-45fb-aba6-e32bccfda1c1) [use automatic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7d10fcb2-b368-48ab-996b-7c9fafcf68ed) [use concurrent programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25b291b5-8245-4d9d-b391-86a8a31d7109) [use functional programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d31fab87-2a7d-485c-b699-2901ca294b15) [use logic programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c4e11ef-da18-4e19-816b-e6bc19e12424) [use object-oriented programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5b9cde20-f1b9-4adc-bfb3-dbf70b14138d) [use query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75f839c2-fd9a-4ad3-8921-6e734608568d) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Optional Knowledge**

[AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Ansible](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f8a40d6-f9ce-43ec-a72f-d4213a53f3ed) [Apache Maven](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d168770-4d9c-4096-b048-a6577818d306) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Eclipse (integrated development environment software)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b6a9252-2ed7-4862-a02f-1578f4a532ea) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [Internet of Things](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f049d050-12da-4e40-813a-2b5eb6df6b51) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Jenkins (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f47a1998-0beb-43be-9f46-380aa4d183da) [KDevelop](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/013441c1-1f13-47e9-80c4-9a53e8e1bc05) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Puppet (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6417a4cc-6f61-4459-a114-761a7fa0279d) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [STAF](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f0167e-75d9-46cf-847f-72a592880ebb) [Salt (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7451027-8249-405a-bb1b-342ff0f3fb3b) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [World Wide Web Consortium standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8696aff0-18c0-4ba6-a4d0-9a21861b3e5e) [Xcode](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/449d119b-2d66-43a9-9230-7d27f16afbb6) [attack vectors](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/501537a7-9d63-491d-ae02-09f04767ff1e) [blockchain openness](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3c2e6f38-42c1-46ec-b782-5854b2db330d) [blockchain platforms](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9035afc4-5317-455d-ab60-f32e2ecc6bfc) [defence standard procedures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/17924c75-45f4-4593-afac-eea0d51f04b5) [object-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5be3d306-6cf1-4b49-aa1d-01651dd4ba4c) [smart contract](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/670f8eea-f25b-4c3f-97ef-a4729d4c63d6) [software anomalies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/438ff259-d086-4004-acda-1ec3e1631bc6) [systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cdd8b6b2-2fd9-453c-8d62-8a1dc6efcd49)

**Essential Skills and Competences**

[analyse ICT system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7adb8473-bcc6-4ff8-9850-76d945d40092) [create business process models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a7792a9-888a-46ad-afc9-2c0d94c8fde6) [define software architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f7e2eb04-3e50-4561-bce1-7e51a1fec308) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [design information system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a47d194d-0ffd-4aaa-b695-fbbe0255000e) [interpret technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be48353d-25c7-4f86-bea9-7b9e248fbc6e)

**Essential Knowledge**

[blockchain consensus mechanisms](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f7e051fc-8f7b-45b3-8911-8ffb9b951f4a) [blockchain openness](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3c2e6f38-42c1-46ec-b782-5854b2db330d) [blockchain platforms](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9035afc4-5317-455d-ab60-f32e2ecc6bfc) [business processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9e84a506-df06-4be3-874a-fa01293e3dd5) [design thinking](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/df64a7cc-2e96-4304-95d3-56fe0ac2dd39) [principles of distributed ledger technology](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3be79ccc-a455-49b9-8c65-55c50071ba5b) [smart contract](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/670f8eea-f25b-4c3f-97ef-a4729d4c63d6) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575)

**Optional Skills and Competences**

[debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [design cloud architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11430d93-c835-48ed-8e70-285fa69c9ae6) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4)

**Optional Knowledge**

[ICT encryption](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d32db06e-bd06-4415-a7ab-1b0ee68caa9a) [SaaS (service-oriented modelling)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eeca3780-8049-499f-a268-95a7ad26642c) [cloud technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd14968e-e409-45af-b362-3495ed7b10e0) [data analytics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/97bd1c21-66b2-4b7e-ad0f-e3cda590e378) [decentralized application frameworks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/251b5528-693c-4ef9-a7f6-9924bb8d7ef8) [software components libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/484df271-bb52-49f1-8f50-f19624bf4df2) [statistics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7ee4c2ea-b349-4bd2-81a3-ec31475d4833)

**Essential Skills and Competences**

[acquire system component](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/90be83d9-56f1-46a4-a6bc-96c51f6c9025) [align software with system architectures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2857540c-180b-4208-9127-e94a01871966) [analyse business requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17) [apply ICT systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cbe2c304-1e7d-489a-97d9-a7d3e37a9db6) [assess ICT knowledge](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0dc7aa1b-b5af-4f4b-81ce-ee22ed8b6926) [create data models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fbafa41f-cd05-4109-a649-8b44d306d779) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [design enterprise architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ee3c1d54-f46a-43c7-a0f9-0ba3648164d0) [design information system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a47d194d-0ffd-4aaa-b695-fbbe0255000e) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [integrate system components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed8de897-adbe-4f0e-b4d2-534953e64c72) [manage database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/29fb0fb5-dfc4-4098-ac9b-3a712000f48f) [manage system testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ce354460-500e-4eaa-8e95-8f243fcea3db) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use markup languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0af062de-eb43-41e9-9b96-249e2cd22d26)

**Essential Knowledge**

[business process modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/98301d4a-2cc3-439d-8d7f-0b6ac76302bb) [database development tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ef0f3a0-9ce2-4ef1-a987-0366b5cb2dbe) [hardware platforms](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/117373c8-f04b-4fff-8683-aebe36edac81) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575) [systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cdd8b6b2-2fd9-453c-8d62-8a1dc6efcd49) [web programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69bbd53f-fbb0-4476-b4b2-ef7844464e28)

**Optional Skills and Competences**

[apply technical communication skills](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c32ad607-0c4d-4e34-b73f-668298f7bf13) [build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [design cloud architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/11430d93-c835-48ed-8e70-285fa69c9ae6) [design database in the cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e796b51-49d7-4e73-95af-2e7323763f15) [design database scheme](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6c08403c-a5bb-4868-b8c2-b7d039c0e511) [design for organisational complexity](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dfff95c6-9758-4c04-a228-7eaa88dec6cd) [design process](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c28fc20-8a60-4311-8899-5ef8729c05b3) [develop with cloud services](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6b643893-0a1f-4f6c-83a1-e7eef75849b9) [manage cloud data and storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d3286405-49f8-4e8a-8046-a4376b4e7963) [manage staff](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/339ac029-066a-4985-9f9d-b3d7c8fea0bb) [manage standards for data exchange](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cb5cccc9-abe4-4b11-abe6-d27e5cd85fb1) [perform resource planning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f5dd06b8-5d17-4932-9d03-957d0c4f5051) [plan migration to cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a52bed5-fd29-45fb-aba6-e32bccfda1c1) [provide cost benefit analysis reports](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/48b68726-0fd6-4e03-a5eb-82236516ee7a) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [solve ICT system problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9e06bac6-6b91-48ca-8b7d-c1f48cdecd7c) [use object-oriented programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5b9cde20-f1b9-4adc-bfb3-dbf70b14138d)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT process quality models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fafe0b9d-dbd9-46bd-b770-26299539ce66) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [ICT system integration](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6fa1c2c0-a012-4ca0-9642-e01569ba322c) [ICT system programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b105ec9b-0857-41d6-8d07-a83e58b73d90) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [Oracle WebLogic](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/70de94f5-9575-4edd-bca7-c797b023b9d6) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [defence standard procedures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/17924c75-45f4-4593-afac-eea0d51f04b5) [information structure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03ff0d53-573a-47a0-a0ad-1995815a4339) [model based system engineering](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25df422a-bf0a-4f76-8631-d0be91cb8751) [task algorithmisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7482a123-e801-48de-9733-262125671410)

**Essential Skills and Competences**

[analyse ICT system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7adb8473-bcc6-4ff8-9850-76d945d40092) [analyse business processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56042303-972b-41be-9310-58467599ff7e) [analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [analyse the context of an organisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9714735d-6f60-440b-bdbc-aaf45ebcbe78) [apply statistical analysis techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/382c11ed-20d5-4ae7-b60e-15fec527fa6c) [create data models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fbafa41f-cd05-4109-a649-8b44d306d779) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [design information system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a47d194d-0ffd-4aaa-b695-fbbe0255000e) [execute feasibility study](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d74df140-eb69-43e2-bac9-1cafc824d702) [identify ICT system weaknesses](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dad7e408-162f-46a4-8567-db560e19e2fc) [identify customer requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e0c9c11-b39e-43cf-ba95-2fe646f5de64) [interact with users to gather requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a8797f21-1af0-4c5e-98ca-bf1442929363) [manage ICT legacy implication](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/861313ba-3a1a-4d33-842a-1b8e45e2415b) [manage system testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ce354460-500e-4eaa-8e95-8f243fcea3db) [monitor system performance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9190d87f-9792-42e0-bb7f-64294a656bcd) [perform ICT security testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f4a85869-1855-45d5-a43c-7ee8cd451996) [solve ICT system problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9e06bac6-6b91-48ca-8b7d-c1f48cdecd7c) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9)

**Essential Knowledge**

[ICT infrastructure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d0c6d77e-cb25-4770-bf77-2073fc5f7523) [ICT performance analysis methods](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed39edd3-44d0-4a16-9796-bfb99f92baf3) [attack vectors](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/501537a7-9d63-491d-ae02-09f04767ff1e) [decision support systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ce1fe19-7f9e-4070-941d-651673a5693b) [levels of software testing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/85f46538-ae70-498a-bfbc-b8ddafe96c7d) [online analytical processing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b0a3bb25-a02f-43ed-ab1f-994fa66a424a) [software architecture models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2450c3b3-e78e-435b-b84d-e05d984e71dc) [software metrics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fb7aee4d-f6c6-4a87-8e9d-8e542b3771f8) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575)

**Optional Skills and Competences**

[automate cloud tasks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ce8ae6ca-61d8-4174-b457-641de96cbff4) [conduct quantitative research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8316979b-df5a-4dc7-98ef-61ec6a10df84) [execute analytical mathematical calculations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/31c69100-b612-4a61-8db5-fd314318854c) [implement a firewall](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5b5053e-0ef6-4c4e-a3f2-42f955f4322c) [implement a virtual private network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/acf0a78c-f4e3-4bd9-a5cc-9cf4791b3b95) [provide ICT consulting advice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/283cbcd3-7101-4dbb-be37-56f3625515b1) [use query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75f839c2-fd9a-4ad3-8921-6e734608568d)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Apache Tomcat](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0fb753a1-2ef2-4429-84d2-ecb2b24daf7a) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT process quality models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fafe0b9d-dbd9-46bd-b770-26299539ce66) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [NoSQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/76ef6ed3-1658-4a1a-9593-204d799c6d0c) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [Open source model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b16200f4-4f39-4b8b-aa9d-3568054d6bdb) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [Outsourcing model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/63f0aa84-5e4c-4eb6-8e8c-876d9feedf1f) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [SaaS (service-oriented modelling)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eeca3780-8049-499f-a268-95a7ad26642c) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [audit techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a536b36-c5c7-4d10-bf67-a4fb0f8549b2) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [data mining](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25f0ea33-b4a2-4f31-b7b4-7d20e827b180) [distributed computing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/897b393f-e7e0-4248-a40d-d77119694e83) [hardware architectures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e043aeeb-78f5-4049-afbf-12bba52225bc) [hardware platforms](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/117373c8-f04b-4fff-8683-aebe36edac81) [hybrid model](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/67a118f4-8a5f-48f7-8e5f-de34b9ca2c37) [object-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5be3d306-6cf1-4b49-aa1d-01651dd4ba4c) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [service-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/83218cac-3599-417e-93d2-26013cdccd98) [unified modelling language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7193cb6d-8334-494f-86e5-21e6d03a47c3)

**Essential Skills and Competences**

[apply for research funding](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5f0082ab-2131-49b5-94d6-a1821daf57d6) [apply research ethics and scientific integrity principles in research activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/833289fa-3646-4010-9d9e-93ba8c9ef2d8) [apply reverse engineering](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a7a14be2-78b5-4b4a-ba77-2658285e2756) [apply statistical analysis techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/382c11ed-20d5-4ae7-b60e-15fec527fa6c) [communicate with a non-scientific audience](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ff64e9fc-36dd-4035-872a-83aa41dc1ad9) [conduct literature research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d282d6e-8cb9-4339-8e7d-cfafed96b5ed) [conduct qualitative research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fa465db3-56e8-4b5d-a781-e2a313a4ed2d) [conduct quantitative research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8316979b-df5a-4dc7-98ef-61ec6a10df84) [conduct research across disciplines](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f7b071bf-4882-4cfc-ae0a-7e0e0ab94c61) [conduct research interview](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/896563fc-6255-4419-89c2-ffed30159ad6) [conduct scholarly research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/485cdafb-3c7f-4104-ab1c-773e6131a39a) [consult with business clients](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9531fe02-1e1f-4a36-95f7-a76a77cd4b8d) [create prototype of user experience solutions](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/07dd856d-6141-48a7-a228-918f88494812) [demonstrate disciplinary expertise](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4134622c-c3fb-4a41-beb6-6d58ba5107db) [develop professional network with researchers and scientists](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cc61f9e5-d4fc-470e-8606-1ce865ff8386) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [disseminate results to the scientific community](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b1e2927-3542-48da-9063-02925e7562c1) [draft scientific or academic papers and technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/00b9a3aa-7070-4bb5-8020-f228a97cf42f) [evaluate research activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/39f67488-cfd3-4370-8d7e-da98163102d9) [execute ICT user research activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4c2aa71-086f-4a46-b481-2619673c9dfe) [execute analytical mathematical calculations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/31c69100-b612-4a61-8db5-fd314318854c) [increase the impact of science on policy and society](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4d39b27a-b34f-4c89-8d46-df844d42f728) [innovate in ICT](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8327754d-3990-4056-b07e-4faa49cfcd26) [integrate gender dimension in research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd50d616-1f8b-481e-983f-68d2674ff82d) [interact professionally in research and professional environments](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/20a8fe89-d4eb-4698-8521-8881c13377e0) [interact with users to gather requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a8797f21-1af0-4c5e-98ca-bf1442929363) [manage findable accessible interoperable and reusable data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4f5c1208-62fd-4e5a-a51e-306c06947e11) [manage intellectual property rights](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/518dc04d-092d-4fa1-bd82-88b7a9278ef7) [manage open publications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da930e2f-6047-4616-a598-bba8ecef3039) [manage personal professional development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a8d24a95-47b3-4f88-92e7-06600bcd3612) [manage research data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/08b04e53-ed25-41a2-9f90-0b9cd939ba3d) [mentor individuals](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a584a638-a2c0-4b3c-bdf3-a64f87225be9) [operate open source software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b34764d-637c-48f5-aa70-31e15c965db6) [perform project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd5efa8c-e44d-4cbc-91c6-796018dbed68) [perform scientific research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4fabca9a-7435-4f33-b1da-3cdb00340fdc) [plan research process](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f88cb903-83a2-44a3-98a8-e72180ec37a9) [promote open innovation in research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/872a1632-f1db-4feb-bb27-0a6a359b7591) [promote the participation of citizens in scientific and research activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fa642fc3-5cc5-41cf-8926-6617a8b976a7) [promote the transfer of knowledge](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/988f4ac3-a37c-4b0a-a40f-4e0e56b5919e) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [provide user documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/385479b7-5da5-4367-9763-0d15b41bb65b) [publish academic research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/979cf728-896f-4f2c-8fa8-2698ca0d4930) [speak different languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2de4572a-4724-4f76-afc2-72a568a264ac) [synthesise information](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f715be1d-5fc4-49d3-82a5-0b8090d12849) [think abstractly](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9a58cd26-58eb-4a1c-b1b6-64037fe9cfa1) [use methodologies for user-centered design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7364cc39-b9c0-449f-9416-57723e2fd9c4) [write scientific publications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3c2420c-ce9a-4371-8eed-1db479c3a562)

**Essential Knowledge**

[innovation processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2fb8480e-de3c-462b-b169-e8bbb344da68) [scientific research methodology](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed3f3dba-3a35-4ed5-b113-67f4d10ef4c8)

**Optional Skills and Competences**

[apply blended learning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b363bb5f-2c79-40af-94da-33e06f9dee9f) [create solutions to problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03b9b491-fc9b-4868-914a-bf7cd47b5041) [monitor ICT research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cc716f65-a0d0-4fba-95d9-64c358f697c0) [optimise choice of ICT solution](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cfa46e9-b7da-44ac-b09e-9596dffe0425) [perform data mining](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4216e465-7baa-4884-a241-54b197bb9278) [provide multimedia content](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dfb9cec6-3ae3-408a-9d57-c44361bf7aaf) [provide written content](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be40c4c3-a855-4d67-9ca5-6f4428c34b0d) [report analysis results](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c544a9f3-5945-4b54-afed-de0697852817) [teach in academic or vocational contexts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4cd85845-f31c-4306-994d-e12d45114d83)

**Optional Knowledge**

[ICT market](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5609f89-0daf-40bb-bd6b-94f5d7498131) [ICT system user requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ca73ac82-867a-4afa-9732-834aebe896ff) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [emergent technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42cb7669-c371-4903-9c0b-13db67b2e4bb) [information categorisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/93aaf65c-5aad-4e6f-a7ba-ce9bf7c0e6e6) [information extraction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/696e3b5b-8b61-45af-ae4c-3ab700f197ec) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [web analytics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1605025e-a179-421f-8f35-5b07d182a6b2)

**Essential Skills and Competences**

[analyse big data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47a49cd6-097d-457a-9f7b-c290c14930d5) [analyse business requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17) [apply ICT systems theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cbe2c304-1e7d-489a-97d9-a7d3e37a9db6) [create data sets](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/906323f4-00c4-4c3b-ab5a-8af77be3456e) [creatively use digital technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1a4cc54f-1e53-442b-a6d2-1682dc8ef8f9) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [deliver visual presentation of data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3e36d05-8ae8-447f-bb2b-6f9409f85389) [design process](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c28fc20-8a60-4311-8899-5ef8729c05b3) [develop creative ideas](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c4c49d4-9708-433f-8ca7-bf2c5211ee49) [develop statistical software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb165899-d95f-4433-95f2-173fefd716d2) [use data processing techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b70a55d-b8a4-49fc-96c6-15ab4cff2522)

**Essential Knowledge**

[Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [algorithms](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/54924a2c-daca-40d3-9716-4b38ceb04f38) [artificial neural networks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5608d5a0-6d5e-43b7-be37-616501729bb4) [business process modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/98301d4a-2cc3-439d-8d7f-0b6ac76302bb) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [data mining](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25f0ea33-b4a2-4f31-b7b4-7d20e827b180) [data models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fecf8a0d-62c4-4e71-9b03-0f4fc2ad7bf5) [information architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1bba98a7-92b9-450b-9235-e0c905f8f3c4) [information categorisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/93aaf65c-5aad-4e6f-a7ba-ce9bf7c0e6e6) [information extraction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/696e3b5b-8b61-45af-ae4c-3ab700f197ec) [information structure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03ff0d53-573a-47a0-a0ad-1995815a4339) [principles of artificial intelligence](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e465a154-93f7-4973-9ce1-31659fe16dd2) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575) [task algorithmisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7482a123-e801-48de-9733-262125671410) [unstructured data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5e8abde-d2ba-4e8e-a65e-720b71180666) [visual presentation techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/348b74cd-49ce-4844-8bdf-ec188b497213)

**Optional Skills and Competences**

[apply systemic design thinking](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4d30ad07-9e39-4899-81dd-02b280f162f9) [assess ICT knowledge](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0dc7aa1b-b5af-4f4b-81ce-ee22ed8b6926) [build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [build predictive models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/38d49d88-9069-467b-b29e-3cae739bdd4d) [build recommender systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/505e4ef3-7ce4-437d-b7b4-5c608f71c258) [design application interfaces](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b0096dc5-2e2d-4bc1-8172-05bf486c3968) [design database scheme](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6c08403c-a5bb-4868-b8c2-b7d039c0e511) [manage ICT data classification](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03a74eee-2dc6-4147-8667-5cdeb65f122d) [manage ICT semantic integration](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fda917eb-0d6a-4371-8c93-2a10bf950966) [manage business knowledge](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/41bf7ede-fc84-4a57-8c89-b548d11b0ba1) [perform dimensionality reduction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3e2ab38a-4519-4bef-b762-a8bf4836a775) [utilise machine learning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369c2d6-c100-4cf6-bd83-9668d8678433)

**Optional Knowledge**

[Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [business intelligence](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/143769cb-b61e-47d8-a61e-eedfbec1016c) [computer vision](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7b0d5000-00da-4864-b776-6de49a87a669) [database development tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ef0f3a0-9ce2-4ef1-a987-0366b5cb2dbe) [deep learning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ecc4552a-92c5-4222-b18d-faf5ac841080)

**Essential Skills and Competences**

[analyse ICT system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7adb8473-bcc6-4ff8-9850-76d945d40092) [analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [create project specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21fecc8a-392e-49ce-ac26-fb0696ccfead) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [identify customer requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e0c9c11-b39e-43cf-ba95-2fe646f5de64) [identify technological needs](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42fcf80d-7b45-40f3-bd2f-5411c4c0dfa0) [keep up with the latest information systems solutions](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/20c920d4-7ff7-4676-ba61-3f04490d9416) [manage ICT project](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3c76296d-4bbd-44ba-8eaa-95bf275f79b7) [manage changes in ICT system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1e7ed56a-6d6b-422f-962e-38543d150755) [manage contracts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/92721092-fe7c-4689-96bd-4f02385bc0e7) [manage standard enterprise resource planning system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f0393af3-bcd9-41af-a36e-0cfb83b60081) [monitor system performance](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9190d87f-9792-42e0-bb7f-64294a656bcd) [optimise choice of ICT solution](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cfa46e9-b7da-44ac-b09e-9596dffe0425) [provide ICT consulting advice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/283cbcd3-7101-4dbb-be37-56f3625515b1) [provide user documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/385479b7-5da5-4367-9763-0d15b41bb65b) [solve ICT system problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9e06bac6-6b91-48ca-8b7d-c1f48cdecd7c) [verify formal ICT specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ee3b1553-2dc5-434b-8dcf-4ae3a40b3a48)

**Essential Knowledge**

[ICT sales methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/628664ec-a63b-4486-8d65-02aba81c82a0) [ICT system integration](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6fa1c2c0-a012-4ca0-9642-e01569ba322c) [legal requirements of ICT products](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a846cb9e-c152-41e7-bd34-45e7ff941e3b) [visual presentation techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/348b74cd-49ce-4844-8bdf-ec188b497213)

**Optional Skills and Competences**

[identify ICT user needs](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ddfe79e2-c2e3-4ba7-9bdf-3820b4f75b54) [interact with users to gather requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a8797f21-1af0-4c5e-98ca-bf1442929363) [keep task records](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/43b13058-68d0-40c6-8031-caf5a7b7d20c) [maintain relationship with customers](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2239694b-771a-4586-8b54-2794e361a9ae) [manage ICT change request process](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a099c81-6a0c-4f00-bb3b-990d23ec03a5) [use e-services](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d908a818-70ef-419e-9d60-8f459114cb2f)

**Optional Knowledge**

[Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [ICT process quality models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fafe0b9d-dbd9-46bd-b770-26299539ce66) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [copyright legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e2103a1d-4a84-47a9-b4f7-774787573449) [emergent technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42cb7669-c371-4903-9c0b-13db67b2e4bb) [hardware components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4b51e76e-9e8a-455f-a289-5b48246345c4) [software components libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/484df271-bb52-49f1-8f50-f19624bf4df2) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575)

**Essential Skills and Competences**

[analyse business processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56042303-972b-41be-9310-58467599ff7e) [analyse business requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17) [analyse the context of an organisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9714735d-6f60-440b-bdbc-aaf45ebcbe78) [apply change management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3c03ee71-4a23-448f-b79e-81fd75d27dca) [create business process models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a7792a9-888a-46ad-afc9-2c0d94c8fde6) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [identify customer requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0e0c9c11-b39e-43cf-ba95-2fe646f5de64) [identify legal requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b9bf9e17-ae47-417b-bbb1-e8b7c263ccac) [implement strategic planning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f7b5d916-52f0-4865-b6a6-e1a3b711cb5e) [interact with users to gather requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a8797f21-1af0-4c5e-98ca-bf1442929363) [propose ICT solutions to business problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/07e51c60-763a-4335-b4ec-70a15f66d328) [provide cost benefit analysis reports](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/48b68726-0fd6-4e03-a5eb-82236516ee7a) [translate requirements into visual design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2d6d4784-0992-48e7-b100-22d7229b3f0a)

**Essential Knowledge**

[business process modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/98301d4a-2cc3-439d-8d7f-0b6ac76302bb) [business requirements techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ee94c0a-3716-494a-95a2-dcbab9e58be2) [legal requirements of ICT products](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a846cb9e-c152-41e7-bd34-45e7ff941e3b) [product usage risks analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4913d0c0-133a-4c46-aac3-f5d4989a982e)

**Optional Skills and Competences**

[design process](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c28fc20-8a60-4311-8899-5ef8729c05b3) [execute analytical mathematical calculations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/31c69100-b612-4a61-8db5-fd314318854c) [manage ICT project](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3c76296d-4bbd-44ba-8eaa-95bf275f79b7) [provide user documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/385479b7-5da5-4367-9763-0d15b41bb65b)

**Optional Knowledge**

[ICT market](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5609f89-0daf-40bb-bd6b-94f5d7498131) [business ICT systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccdbd9bb-4faf-403c-a968-e8bf487f8a53) [business intelligence](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/143769cb-b61e-47d8-a61e-eedfbec1016c) [business strategy concepts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd698bbe-7003-4508-b422-46c2ff4d5e95) [cloud technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd14968e-e409-45af-b362-3495ed7b10e0) [decision support systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ce1fe19-7f9e-4070-941d-651673a5693b) [information architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1bba98a7-92b9-450b-9235-e0c905f8f3c4) [information categorisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/93aaf65c-5aad-4e6f-a7ba-ce9bf7c0e6e6) [information extraction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/696e3b5b-8b61-45af-ae4c-3ab700f197ec) [innovation processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2fb8480e-de3c-462b-b169-e8bbb344da68) [internal risk management policy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0daaf096-1639-461c-bf1a-bbeea77e6b67) [organisational resilience](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/79f24a62-7718-46e1-9b41-37be0560a5ca) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575) [unstructured data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5e8abde-d2ba-4e8e-a65e-720b71180666) [visual presentation techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/348b74cd-49ce-4844-8bdf-ec188b497213)

**Essential Skills and Competences**

[analyse business requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17) [coordinate technological activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/af607e5e-4ba1-4e5f-a2a6-dc05806567c7) [create business process models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a7792a9-888a-46ad-afc9-2c0d94c8fde6) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [design process](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2c28fc20-8a60-4311-8899-5ef8729c05b3) [implement strategic planning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f7b5d916-52f0-4865-b6a6-e1a3b711cb5e) [improve business processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75b30aeb-34c0-40f4-b77d-271d75a98b14) [make strategic business decisions](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f60c9e52-95fc-4ca1-a73c-18a491153b63) [manage ICT project](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3c76296d-4bbd-44ba-8eaa-95bf275f79b7) [perform business analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/27ed854c-15b8-4ba2-90e9-ae888a219703) [propose ICT solutions to business problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/07e51c60-763a-4335-b4ec-70a15f66d328) [provide ICT consulting advice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/283cbcd3-7101-4dbb-be37-56f3625515b1) [provide cost benefit analysis reports](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/48b68726-0fd6-4e03-a5eb-82236516ee7a) [track key performance indicators](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8dcbcabe-09f7-4d11-940d-125af57bbc40) [write work-related reports](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/918f5211-b99f-4b29-9a34-6e475583ef55)

**Essential Knowledge**

[ICT security legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7814e88f-c133-4c3b-b27f-857afa145d42) [business process modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/98301d4a-2cc3-439d-8d7f-0b6ac76302bb) [business processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9e84a506-df06-4be3-874a-fa01293e3dd5) [decision support systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ce1fe19-7f9e-4070-941d-651673a5693b)

**Optional Skills and Competences**

[adapt to changing situations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5592ab32-4e7a-4cda-8e64-ca36d5de8a10) [apply change management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3c03ee71-4a23-448f-b79e-81fd75d27dca) [communicate with customers](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0da516ee-e70e-4384-be13-f5ff80be8127) [execute analytical mathematical calculations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/31c69100-b612-4a61-8db5-fd314318854c) [perform data mining](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4216e465-7baa-4884-a241-54b197bb9278) [provide training on technological business developments](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c216189-4116-4e49-9557-8360378ea717) [use different communication channels](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/415abd43-e8e5-4643-b5da-5f11307af57a)

**Optional Knowledge**

[ICT market](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5609f89-0daf-40bb-bd6b-94f5d7498131) [business strategy concepts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd698bbe-7003-4508-b422-46c2ff4d5e95) [data mining](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25f0ea33-b4a2-4f31-b7b4-7d20e827b180) [information extraction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/696e3b5b-8b61-45af-ae4c-3ab700f197ec) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575) [visual presentation techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/348b74cd-49ce-4844-8bdf-ec188b497213)

**Essential Skills and Competences**

[apply business acumen](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4ddf5204-95f5-4be2-ad35-571e2f493ae5) [consult with business clients](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9531fe02-1e1f-4a36-95f7-a76a77cd4b8d) [create project specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21fecc8a-392e-49ce-ac26-fb0696ccfead) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [ensure compliance with environmental legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/089ee650-297e-4716-87d1-440743b70a0d) [manage environmental impact of operations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d86babea-bf8b-4552-81a8-daf706066ad6) [optimise choice of ICT solution](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cfa46e9-b7da-44ac-b09e-9596dffe0425) [promote environmental awareness](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8abdc43c-2bfd-417c-97c2-27fcdaf53171) [provide ICT consulting advice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/283cbcd3-7101-4dbb-be37-56f3625515b1) [report on environmental issues](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f3cc52e3-a96c-4549-b841-6e41a846fa99)

**Essential Knowledge**

[ICT environmental policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ee02393d-27dd-438a-8879-b8088ce45e79)

**Optional Skills and Competences**

[advise on environmental remediation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b422efe7-b151-4120-86ae-db11a48dd0fa) [track key performance indicators](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8dcbcabe-09f7-4d11-940d-125af57bbc40)

**Optional Knowledge**

[ICT market](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5609f89-0daf-40bb-bd6b-94f5d7498131) [ICT power consumption](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f88002a8-6355-4d33-9496-285c166ff375) [ICT sales methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/628664ec-a63b-4486-8d65-02aba81c82a0) [copyright legislation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e2103a1d-4a84-47a9-b4f7-774787573449) [emergent technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42cb7669-c371-4903-9c0b-13db67b2e4bb) [hardware components suppliers](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed1fbdc3-1071-423c-9bb4-e3288ca6d1fe) [legal requirements of ICT products](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a846cb9e-c152-41e7-bd34-45e7ff941e3b) [software components suppliers](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e6b8f934-7f35-4dc6-9a64-f6c43acdc00b)

**Essential Skills and Competences**

[align software with system architectures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2857540c-180b-4208-9127-e94a01871966) [apply ICT system usage policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9707091a-323b-4240-877a-5999a19286f0) [collect customer feedback on applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71746a0b-e58d-4dc4-ad03-bd84082eae21) [define software architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f7e2eb04-3e50-4561-bce1-7e51a1fec308) [design enterprise architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ee3c1d54-f46a-43c7-a0f9-0ba3648164d0) [design information system](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a47d194d-0ffd-4aaa-b695-fbbe0255000e) [execute feasibility study](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d74df140-eb69-43e2-bac9-1cafc824d702) [implement ICT safety policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/14d1e367-3efe-4ec5-86ae-eca48710ee4e) [keep up with the latest information systems solutions](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/20c920d4-7ff7-4676-ba61-3f04490d9416) [manage ICT data architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4d85b881-e490-4b4c-897a-2faa4ef53956) [perform project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd5efa8c-e44d-4cbc-91c6-796018dbed68) [perform risk analysis](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1dd23dba-dd00-45ab-abf4-642902538317) [provide ICT consulting advice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/283cbcd3-7101-4dbb-be37-56f3625515b1) [review development process of an organisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cb1b0777-0388-4b01-a0cf-7c6bbfbbd61d) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9)

**Essential Knowledge**

[ICT architectural frameworks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c453cf81-6197-428e-84c6-70c773b63f27) [ICT market](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e5609f89-0daf-40bb-bd6b-94f5d7498131) [ICT project management methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9) [business strategy concepts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd698bbe-7003-4508-b422-46c2ff4d5e95) [information architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1bba98a7-92b9-450b-9235-e0c905f8f3c4) [legal requirements of ICT products](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a846cb9e-c152-41e7-bd34-45e7ff941e3b) [object-oriented modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5be3d306-6cf1-4b49-aa1d-01651dd4ba4c)

**Optional Skills and Competences**

[analyse business requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17) [apply conflict management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ee94af1-b445-4973-9c3f-459fab250342) [apply information security policies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/86d2e2ea-1ba2-4aa6-b465-8a1f9abc81b8) [apply systemic design thinking](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4d30ad07-9e39-4899-81dd-02b280f162f9) [build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [coordinate technological activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/af607e5e-4ba1-4e5f-a2a6-dc05806567c7) [manage cloud data and storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d3286405-49f8-4e8a-8046-a4376b4e7963) [manage staff](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/339ac029-066a-4985-9f9d-b3d7c8fea0bb) [monitor technology trends](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7a17d7ce-01a2-4746-bbcc-22ffe22fa16e) [optimise choice of ICT solution](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cfa46e9-b7da-44ac-b09e-9596dffe0425) [provide cost benefit analysis reports](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/48b68726-0fd6-4e03-a5eb-82236516ee7a) [use different communication channels](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/415abd43-e8e5-4643-b5da-5f11307af57a)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Agile development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dba46f87-0831-49cd-a1c7-340a653c0221) [Agile project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0a9acb6b-1139-4be9-b431-3a80a959f2f4) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [DevOps](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f0de4973-0a70-4644-8fd4-3a97080476f4) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [Incremental development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/00c04e40-35ea-4ed1-824c-82f936c8f876) [Iterative development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/33d49d4f-31ec-473f-9b8a-b555aa5116bb) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Lean project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da6393d5-a53c-4863-abc7-51f36281d74e) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Process-based management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d5a59ca8-2e91-472e-8571-d12ce4478679) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Prototyping development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed1d8bd4-cd2a-4c64-b665-56d70651026c) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Rapid application development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/96eb286a-58b7-45ff-a916-5578d0b79b8c) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Spiral development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4840338b-ac6c-486a-be1d-9ddfe00b8bdf) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [Waterfall development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6a876489-7ad8-4a13-b09c-c9b8e97a302e) [business process modelling](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/98301d4a-2cc3-439d-8d7f-0b6ac76302bb) [business requirements techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ee94c0a-3716-494a-95a2-dcbab9e58be2) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [emergent technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42cb7669-c371-4903-9c0b-13db67b2e4bb) [software architecture models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2450c3b3-e78e-435b-b84d-e05d984e71dc) [software design methodologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8ff015a0-98ea-4d80-a23e-1f68110a919e) [unified modelling language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7193cb6d-8334-494f-86e5-21e6d03a47c3)

**Essential Skills and Competences**

[analyse software specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f28617ad-afdd-4041-814c-216153a38998) [create flowchart diagram](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/901105f8-3a08-453e-b1dc-23619e317fd3) [create software design](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3bddfd7c-ab6d-40c2-883d-5e97fb7640ba) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [develop creative ideas](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8c4c49d4-9708-433f-8ca7-bf2c5211ee49) [interpret electronic design specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e76dd90d-91c4-49c0-bfd0-dfa2c4c90c81) [provide ICT consulting advice](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/283cbcd3-7101-4dbb-be37-56f3625515b1)

**Essential Knowledge**

[ICT communications protocols](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6e4f75b4-c60f-4623-a9ba-760c8245753b) [embedded systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2180bd8c-86de-4889-8165-adac902eee9d) [engineering control theory](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3c42d13b-d6e4-4ed9-bdc4-991251461dc4) [real-time computing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bf6c5ed4-84af-440f-abcc-7fa5ba19c738) [signal processing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cfa2be0d-96d5-4017-a866-962efb9c5070) [systems development life-cycle](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575) [task algorithmisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7482a123-e801-48de-9733-262125671410) [tools for software configuration management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9d2e926f-53d9-41f5-98f3-19dfaa687f3f)

**Optional Skills and Competences**

[build business relationships](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dc72ad0a-c5dc-4abd-bc0d-ca43e82162e1) [collect customer feedback on applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/71746a0b-e58d-4dc4-ad03-bd84082eae21) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51) [verify formal ICT specifications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ee3b1553-2dc5-434b-8dcf-4ae3a40b3a48)

**Optional Knowledge**

[ABAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/eb0e5615-1575-4a86-a1a2-7d39595033c5) [AJAX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b4dc6e4f-dc7d-445f-8ce2-d7b9d225e282) [APL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/58d7a289-dafd-4363-833f-d1dc4140885e) [ASP.NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/56a7f561-1d55-43c9-9cd7-36a0a9bc6c50) [Ansible](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6f8a40d6-f9ce-43ec-a72f-d4213a53f3ed) [Apache Maven](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d168770-4d9c-4096-b048-a6577818d306) [Assembly (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47b9bbcf-356c-4782-83a4-7f5a1b2b51a3) [C#](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4c016b68-4116-468c-9dc6-42710c239e4a) [C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b633eb55-8f1f-4ae6-ab4c-2022ffe2cb7f) [COBOL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/def007fa-5fed-4a5f-91a2-b0d7e3db1be1) [CoffeeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/993b1e23-f2de-4bd8-b33f-f86dde1c8e9d) [Common Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0cd6dcf1-5778-42a5-b685-4d01ae4a4871) [Erlang](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/034c29fa-c3ba-45ea-b8f3-bf8e3705e386) [Groovy](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/52cf3037-ab53-4806-85ed-7fd21ea7f6a1) [Haskell](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/000f1d3d-220f-4789-9c0a-cc742521fb02) [ICT network simulation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f6424ebb-8401-446b-9f7e-10d7c854da02) [ICT security standards](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3ff589b7-68df-4ea5-ae41-b395bdb2378f) [ICT system integration](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6fa1c2c0-a012-4ca0-9642-e01569ba322c) [Java (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/19a8293b-8e95-4de3-983f-77484079c389) [JavaScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3cd569a2-4f88-4c1e-9995-8dce8c5e51a7) [Jenkins (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f47a1998-0beb-43be-9f46-380aa4d183da) [Lisp](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0de61385-de6d-4146-ba32-1cc1bc102220) [MATLAB](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3a03c5a-c260-4c26-9b9a-873abb396f4d) [ML (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4d336a6-9ffd-402a-91cc-f359716ba4e0) [Microsoft Visual C++](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8369ede5-4200-4a44-be2e-bc60ef959259) [Objective-C](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9973a5a2-7822-4161-99e9-95c781eb63f8) [OpenEdge Advanced Business Language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/300d432b-f457-4cd3-9cb1-1858c7d14954) [PHP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4350c38d-0fe9-4ca7-bab9-40ed7f72b04f) [Pascal (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e8b89eb6-51e8-4c3a-babb-88b2e110376b) [Perl](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/401eb8d8-6daa-4f8b-90ad-60afc71eb4f8) [Prolog (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2bde42ae-e776-41c1-9ded-b07b30bfe985) [Puppet (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6417a4cc-6f61-4459-a114-761a7fa0279d) [Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [R](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/51586df8-1c46-4b47-8583-773cb63bf00b) [Ruby (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ccdfe98-f845-4598-84a1-3dca66e9d9a3) [SAP R3](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb99af26-71ff-4dca-bde7-1eb1f6194426) [SAS language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04f1b938-d4d4-4cb1-a863-982af76b9d93) [STAF](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/69f0167e-75d9-46cf-847f-72a592880ebb) [Salt (tools for software configuration management)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7451027-8249-405a-bb1b-342ff0f3fb3b) [Scala](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ffddfc7c-a9dd-449f-9e96-882dc447c8b6) [Scratch (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d56fc2b5-4b0a-4e7e-9bde-a33736f6ff18) [Smalltalk (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42ed3bfb-1a01-4c8b-9758-fc6438865734) [Swift (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/be80acfc-b6f2-4411-9b8d-b19d9cd2556a) [TypeScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/867137fb-ff1b-4ca3-99f3-cb6969aa2c68) [VBScript](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/dcdd5ddf-82a6-4ac3-8edc-d4b23cae9a88) [Visual Studio .NET](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/13bdd41a-2a18-441f-96db-41252c519413) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [engineering processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/72a74f69-5cf1-43c5-99b9-62a444578919) [field-programmable gate arrays](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fb601189-afa9-4a7b-8430-21a906483072) [hardware architectures](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e043aeeb-78f5-4049-afbf-12bba52225bc) [hardware components](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4b51e76e-9e8a-455f-a289-5b48246345c4) [network management system tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ab03c6c-281b-48f4-83e0-10eeb27a1bae) [software components libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/484df271-bb52-49f1-8f50-f19624bf4df2) [tools for ICT test automation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7557f0f4-b8bc-4ac0-b91e-222ab1ba744f)

**Essential Skills and Competences**

[apply for research funding](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5f0082ab-2131-49b5-94d6-a1821daf57d6) [apply research ethics and scientific integrity principles in research activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/833289fa-3646-4010-9d9e-93ba8c9ef2d8) [build recommender systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/505e4ef3-7ce4-437d-b7b4-5c608f71c258) [collect ICT data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/79e29b8b-47d1-470d-b7b1-32506bfe7d9a) [communicate with a non-scientific audience](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ff64e9fc-36dd-4035-872a-83aa41dc1ad9) [conduct research across disciplines](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f7b071bf-4882-4cfc-ae0a-7e0e0ab94c61) [deliver visual presentation of data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3e36d05-8ae8-447f-bb2b-6f9409f85389) [demonstrate disciplinary expertise](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4134622c-c3fb-4a41-beb6-6d58ba5107db) [design database scheme](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/6c08403c-a5bb-4868-b8c2-b7d039c0e511) [develop data processing applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f9670490-8aa4-4540-b121-d440a8294aab) [develop professional network with researchers and scientists](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cc61f9e5-d4fc-470e-8606-1ce865ff8386) [disseminate results to the scientific community](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b1e2927-3542-48da-9063-02925e7562c1) [draft scientific or academic papers and technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/00b9a3aa-7070-4bb5-8020-f228a97cf42f) [establish data processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2daec0e6-f0c1-43e8-8178-aedba99130ec) [evaluate research activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/39f67488-cfd3-4370-8d7e-da98163102d9) [execute analytical mathematical calculations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/31c69100-b612-4a61-8db5-fd314318854c) [handle data samples](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4a193795-fa63-414e-9f2e-bfdb3924571e) [implement data quality processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/713fb616-118e-40bc-9366-4a69879a49d5) [increase the impact of science on policy and society](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4d39b27a-b34f-4c89-8d46-df844d42f728) [integrate gender dimension in research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd50d616-1f8b-481e-983f-68d2674ff82d) [interact professionally in research and professional environments](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/20a8fe89-d4eb-4698-8521-8881c13377e0) [interpret current data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1e77e42a-181f-4b48-8e74-201ce50ffc29) [manage data collection systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a80fb090-63f4-4b05-83a5-2f090deb7757) [manage findable accessible interoperable and reusable data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4f5c1208-62fd-4e5a-a51e-306c06947e11) [manage intellectual property rights](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/518dc04d-092d-4fa1-bd82-88b7a9278ef7) [manage open publications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da930e2f-6047-4616-a598-bba8ecef3039) [manage personal professional development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a8d24a95-47b3-4f88-92e7-06600bcd3612) [manage research data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/08b04e53-ed25-41a2-9f90-0b9cd939ba3d) [mentor individuals](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a584a638-a2c0-4b3c-bdf3-a64f87225be9) [normalise data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/07889c08-7220-47c8-96f7-6068fbea00dc) [operate open source software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b34764d-637c-48f5-aa70-31e15c965db6) [perform data cleansing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/50b100ea-74fd-4706-99db-3e4ca55e51b8) [perform project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd5efa8c-e44d-4cbc-91c6-796018dbed68) [perform scientific research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4fabca9a-7435-4f33-b1da-3cdb00340fdc) [promote open innovation in research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/872a1632-f1db-4feb-bb27-0a6a359b7591) [promote the participation of citizens in scientific and research activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fa642fc3-5cc5-41cf-8926-6617a8b976a7) [promote the transfer of knowledge](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/988f4ac3-a37c-4b0a-a40f-4e0e56b5919e) [publish academic research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/979cf728-896f-4f2c-8fa8-2698ca0d4930) [report analysis results](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c544a9f3-5945-4b54-afed-de0697852817) [speak different languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2de4572a-4724-4f76-afc2-72a568a264ac) [synthesise information](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f715be1d-5fc4-49d3-82a5-0b8090d12849) [think abstractly](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9a58cd26-58eb-4a1c-b1b6-64037fe9cfa1) [use data processing techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b70a55d-b8a4-49fc-96c6-15ab4cff2522) [use databases](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4463a721-69f3-413d-8321-43e3af13a4f1) [write scientific publications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3c2420c-ce9a-4371-8eed-1db479c3a562)

**Essential Knowledge**

[data mining](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25f0ea33-b4a2-4f31-b7b4-7d20e827b180) [data models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fecf8a0d-62c4-4e71-9b03-0f4fc2ad7bf5) [information categorisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/93aaf65c-5aad-4e6f-a7ba-ce9bf7c0e6e6) [information extraction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/696e3b5b-8b61-45af-ae4c-3ab700f197ec) [online analytical processing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b0a3bb25-a02f-43ed-ab1f-994fa66a424a) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [statistics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7ee4c2ea-b349-4bd2-81a3-ec31475d4833) [visual presentation techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/348b74cd-49ce-4844-8bdf-ec188b497213)

**Optional Skills and Competences**

[apply blended learning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b363bb5f-2c79-40af-94da-33e06f9dee9f) [create data models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fbafa41f-cd05-4109-a649-8b44d306d779) [define data quality criteria](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/54c9c155-9293-4329-8ed2-2e76e8b519d4) [design database in the cloud](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7e796b51-49d7-4e73-95af-2e7323763f15) [integrate ICT data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/46ec0033-3c71-415e-bcff-b065675ba2dc) [manage ICT data architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4d85b881-e490-4b4c-897a-2faa4ef53956) [manage ICT data classification](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03a74eee-2dc6-4147-8667-5cdeb65f122d) [manage data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ff9db9d-d14b-426e-83f3-e7449af6c79f) [perform data mining](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4216e465-7baa-4884-a241-54b197bb9278) [teach in academic or vocational contexts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4cd85845-f31c-4306-994d-e12d45114d83) [use spreadsheets software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1973c966-f236-40c9-b2d4-5d71a89019be)

**Optional Knowledge**

[Hadoop](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e46291c7-52b9-4174-bd59-178884861038) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [business intelligence](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/143769cb-b61e-47d8-a61e-eedfbec1016c) [data quality assessment](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cc7370dd-69fa-4c67-a96f-d4d135d38700) [unstructured data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5e8abde-d2ba-4e8e-a65e-720b71180666)

**Essential Skills and Competences**

[analyse big data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/47a49cd6-097d-457a-9f7b-c290c14930d5) [apply statistical analysis techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/382c11ed-20d5-4ae7-b60e-15fec527fa6c) [collect ICT data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/79e29b8b-47d1-470d-b7b1-32506bfe7d9a) [define data quality criteria](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/54c9c155-9293-4329-8ed2-2e76e8b519d4) [establish data processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2daec0e6-f0c1-43e8-8178-aedba99130ec) [execute analytical mathematical calculations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/31c69100-b612-4a61-8db5-fd314318854c) [handle data samples](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4a193795-fa63-414e-9f2e-bfdb3924571e) [implement data quality processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/713fb616-118e-40bc-9366-4a69879a49d5) [integrate ICT data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/46ec0033-3c71-415e-bcff-b065675ba2dc) [interpret current data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1e77e42a-181f-4b48-8e74-201ce50ffc29) [manage data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9ff9db9d-d14b-426e-83f3-e7449af6c79f) [normalise data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/07889c08-7220-47c8-96f7-6068fbea00dc) [perform data cleansing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/50b100ea-74fd-4706-99db-3e4ca55e51b8) [perform data mining](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4216e465-7baa-4884-a241-54b197bb9278) [use data processing techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b70a55d-b8a4-49fc-96c6-15ab4cff2522) [use databases](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4463a721-69f3-413d-8321-43e3af13a4f1)

**Essential Knowledge**

[business intelligence](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/143769cb-b61e-47d8-a61e-eedfbec1016c) [data mining](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25f0ea33-b4a2-4f31-b7b4-7d20e827b180) [data models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fecf8a0d-62c4-4e71-9b03-0f4fc2ad7bf5) [data quality assessment](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cc7370dd-69fa-4c67-a96f-d4d135d38700) [documentation types](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/327d15c8-29ff-4ad4-a4fe-6536d777a45f) [information categorisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/93aaf65c-5aad-4e6f-a7ba-ce9bf7c0e6e6) [information confidentiality](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a56dec32-05ef-45de-a256-ee6741f356db) [information extraction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/696e3b5b-8b61-45af-ae4c-3ab700f197ec) [information structure](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03ff0d53-573a-47a0-a0ad-1995815a4339) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [statistics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7ee4c2ea-b349-4bd2-81a3-ec31475d4833) [unstructured data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5e8abde-d2ba-4e8e-a65e-720b71180666) [visual presentation techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/348b74cd-49ce-4844-8bdf-ec188b497213)

**Optional Skills and Competences**

[create data models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fbafa41f-cd05-4109-a649-8b44d306d779) [deliver visual presentation of data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3e36d05-8ae8-447f-bb2b-6f9409f85389) [gather data for forensic purposes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0c766ca3-9364-4203-916b-fed16e4814c1) [manage cloud data and storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d3286405-49f8-4e8a-8046-a4376b4e7963) [manage data collection systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a80fb090-63f4-4b05-83a5-2f090deb7757) [manage quantitative data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/57231a22-4da7-49c8-97b8-75672feadf1e) [report analysis results](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c544a9f3-5945-4b54-afed-de0697852817) [store digital data and systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/611ed16b-99bf-4840-9cab-f55d1d286e0a) [use spreadsheets software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1973c966-f236-40c9-b2d4-5d71a89019be)

**Optional Knowledge**

[Hadoop](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e46291c7-52b9-4174-bd59-178884861038) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [cloud technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bd14968e-e409-45af-b362-3495ed7b10e0) [data storage](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a7f0fbe0-c546-4f30-8e41-34a58c64567e) [database](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/43ae58b9-5e56-4524-b45a-b422777a0576) [information architecture](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1bba98a7-92b9-450b-9235-e0c905f8f3c4) [online analytical processing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b0a3bb25-a02f-43ed-ab1f-994fa66a424a) [web analytics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1605025e-a179-421f-8f35-5b07d182a6b2)

**Essential Skills and Competences**

[apply statistical analysis techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/382c11ed-20d5-4ae7-b60e-15fec527fa6c) [conduct literature research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d282d6e-8cb9-4339-8e7d-cfafed96b5ed) [define technical requirements](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/d9e5349e-8791-49c2-8ba4-839fdd1606c2) [deliver visual presentation of data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3e36d05-8ae8-447f-bb2b-6f9409f85389) [develop data processing applications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f9670490-8aa4-4540-b121-d440a8294aab) [develop software prototype](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/797a4416-0b8d-44f3-8fcd-eb10bd0be6b4) [establish data processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2daec0e6-f0c1-43e8-8178-aedba99130ec) [execute analytical mathematical calculations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/31c69100-b612-4a61-8db5-fd314318854c) [handle data samples](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4a193795-fa63-414e-9f2e-bfdb3924571e) [implement data quality processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/713fb616-118e-40bc-9366-4a69879a49d5) [interpret current data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1e77e42a-181f-4b48-8e74-201ce50ffc29) [manage data collection systems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a80fb090-63f4-4b05-83a5-2f090deb7757) [normalise data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/07889c08-7220-47c8-96f7-6068fbea00dc) [perform data cleansing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/50b100ea-74fd-4706-99db-3e4ca55e51b8) [perform dimensionality reduction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3e2ab38a-4519-4bef-b762-a8bf4836a775) [provide technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e) [report analysis results](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c544a9f3-5945-4b54-afed-de0697852817) [use software libraries](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8b94aa1e-89c9-459d-b3b4-1dfab8dec2df) [utilise computer-aided software engineering tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/172020d1-e151-445b-8173-e2a5fb16fe51)

**Essential Knowledge**

[Python (computer programming)](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ccd0a1d9-afda-43d9-b901-96344886e14d) [computer programming](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/21d2f96d-35f7-4e3f-9745-c533d2dd6e97) [digital image processing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/945b8655-5577-4c3a-946a-842d4527afa8) [integrated development environment software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/925463a7-d51f-4d5b-9f79-4d28cf30acde) [machine learning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3a2d5b45-56e4-4f5a-a55a-4a4a65afdc43) [principles of artificial intelligence](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/e465a154-93f7-4973-9ce1-31659fe16dd2) [statistics](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/7ee4c2ea-b349-4bd2-81a3-ec31475d4833)

**Optional Skills and Competences**

[conduct qualitative research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fa465db3-56e8-4b5d-a781-e2a313a4ed2d) [conduct quantitative research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8316979b-df5a-4dc7-98ef-61ec6a10df84) [conduct scholarly research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/485cdafb-3c7f-4104-ab1c-773e6131a39a) [create data models](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fbafa41f-cd05-4109-a649-8b44d306d779) [debug software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2522a6ce-3202-4ac8-9f5b-b9cb5a3a83a1) [define data quality criteria](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/54c9c155-9293-4329-8ed2-2e76e8b519d4) [design user interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fd33c66c-70c4-40e6-b87c-5495bd3bf26e) [perform data mining](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4216e465-7baa-4884-a241-54b197bb9278) [use markup languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0af062de-eb43-41e9-9b96-249e2cd22d26)

**Optional Knowledge**

[deep learning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ecc4552a-92c5-4222-b18d-faf5ac841080) [image formation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/734b6025-0d14-499d-8e95-fdf512058e77) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [signal processing](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cfa2be0d-96d5-4017-a866-962efb9c5070)

**Essential Skills and Competences**

[apply for research funding](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5f0082ab-2131-49b5-94d6-a1821daf57d6) [apply research ethics and scientific integrity principles in research activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/833289fa-3646-4010-9d9e-93ba8c9ef2d8) [apply reverse engineering](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a7a14be2-78b5-4b4a-ba77-2658285e2756) [apply statistical analysis techniques](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/382c11ed-20d5-4ae7-b60e-15fec527fa6c) [communicate with a non-scientific audience](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ff64e9fc-36dd-4035-872a-83aa41dc1ad9) [conduct literature research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0d282d6e-8cb9-4339-8e7d-cfafed96b5ed) [conduct qualitative research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fa465db3-56e8-4b5d-a781-e2a313a4ed2d) [conduct quantitative research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8316979b-df5a-4dc7-98ef-61ec6a10df84) [conduct research across disciplines](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f7b071bf-4882-4cfc-ae0a-7e0e0ab94c61) [conduct research interview](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/896563fc-6255-4419-89c2-ffed30159ad6) [conduct scholarly research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/485cdafb-3c7f-4104-ab1c-773e6131a39a) [demonstrate disciplinary expertise](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4134622c-c3fb-4a41-beb6-6d58ba5107db) [develop professional network with researchers and scientists](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cc61f9e5-d4fc-470e-8606-1ce865ff8386) [disseminate results to the scientific community](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b1e2927-3542-48da-9063-02925e7562c1) [draft scientific or academic papers and technical documentation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/00b9a3aa-7070-4bb5-8020-f228a97cf42f) [evaluate research activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/39f67488-cfd3-4370-8d7e-da98163102d9) [execute ICT user research activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a4c2aa71-086f-4a46-b481-2619673c9dfe) [execute analytical mathematical calculations](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/31c69100-b612-4a61-8db5-fd314318854c) [increase the impact of science on policy and society](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4d39b27a-b34f-4c89-8d46-df844d42f728) [integrate gender dimension in research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd50d616-1f8b-481e-983f-68d2674ff82d) [interact professionally in research and professional environments](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/20a8fe89-d4eb-4698-8521-8881c13377e0) [manage findable accessible interoperable and reusable data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4f5c1208-62fd-4e5a-a51e-306c06947e11) [manage intellectual property rights](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/518dc04d-092d-4fa1-bd82-88b7a9278ef7) [manage open publications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/da930e2f-6047-4616-a598-bba8ecef3039) [manage personal professional development](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a8d24a95-47b3-4f88-92e7-06600bcd3612) [manage research data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/08b04e53-ed25-41a2-9f90-0b9cd939ba3d) [mentor individuals](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a584a638-a2c0-4b3c-bdf3-a64f87225be9) [operate open source software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2b34764d-637c-48f5-aa70-31e15c965db6) [perform project management](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/cd5efa8c-e44d-4cbc-91c6-796018dbed68) [perform scientific research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4fabca9a-7435-4f33-b1da-3cdb00340fdc) [promote open innovation in research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/872a1632-f1db-4feb-bb27-0a6a359b7591) [promote the participation of citizens in scientific and research activities](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/fa642fc3-5cc5-41cf-8926-6617a8b976a7) [promote the transfer of knowledge](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/988f4ac3-a37c-4b0a-a40f-4e0e56b5919e) [publish academic research](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/979cf728-896f-4f2c-8fa8-2698ca0d4930) [speak different languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2de4572a-4724-4f76-afc2-72a568a264ac) [synthesise information](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f715be1d-5fc4-49d3-82a5-0b8090d12849) [synthesise research publications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a8b3957f-08b4-4a76-927d-0b2e3d0dbd39) [think abstractly](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9a58cd26-58eb-4a1c-b1b6-64037fe9cfa1) [use an application-specific interface](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/04fe962b-4017-4eb7-9139-7d69b6922bc9) [use back-up and recovery tools](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/82de2df7-0d6c-42b1-94ac-b3e9a029e917) [write research proposals](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0ee7b0d6-db98-4785-9948-f2ef415d155a) [write scientific publications](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c3c2420c-ce9a-4371-8eed-1db479c3a562)

**Essential Knowledge**

[scientific research methodology](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/ed3f3dba-3a35-4ed5-b113-67f4d10ef4c8)

**Optional Skills and Competences**

[apply blended learning](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/b363bb5f-2c79-40af-94da-33e06f9dee9f) [create solutions to problems](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/03b9b491-fc9b-4868-914a-bf7cd47b5041) [develop professional network](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bf5d77ad-e18c-48d8-83f0-bc79c011c74a) [implement anti-virus software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/bb2b4485-2bad-402f-8517-44bf7d9afff4) [innovate in ICT](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/8327754d-3990-4056-b07e-4faa49cfcd26) [perform data mining](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4216e465-7baa-4884-a241-54b197bb9278) [process data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f2d57f41-43b4-4f5b-8100-3df5c21eda50) [report analysis results](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c544a9f3-5945-4b54-afed-de0697852817) [teach in academic or vocational contexts](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/4cd85845-f31c-4306-994d-e12d45114d83) [use presentation software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/234aeb8d-56c3-4531-9193-1c5e6a8d16cb) [use query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/75f839c2-fd9a-4ad3-8921-6e734608568d) [use spreadsheets software](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1973c966-f236-40c9-b2d4-5d71a89019be)

**Optional Knowledge**

[Apache Tomcat](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/0fb753a1-2ef2-4429-84d2-ecb2b24daf7a) [JavaScript Framework](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9b9de2a4-d8af-4a7b-933a-a8334ae60067) [LDAP](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/a57a54b6-2f2e-43e4-9621-b52f4a63cb08) [LINQ](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c7d24594-0c11-4b27-9039-fe0bb903da8e) [MDX](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/1b7c716e-af95-4cda-a42f-6479c8b139f5) [N1QL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/f597f772-24d3-4cec-813c-cf5a7027c794) [NoSQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/76ef6ed3-1658-4a1a-9593-204d799c6d0c) [SPARQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/5da8018b-ae85-4cde-ad93-0394369018f3) [SQL](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/598de5b0-5b58-4ea7-8058-a4bc4d18c742) [XQuery](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/3f4dab51-572b-4e2c-85ef-3b4c3f7094e1) [behavioural science](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/269b8734-fa1d-4c6f-a843-523fa3bbae6e) [business intelligence](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/143769cb-b61e-47d8-a61e-eedfbec1016c) [data mining](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/25f0ea33-b4a2-4f31-b7b4-7d20e827b180) [documentation types](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/327d15c8-29ff-4ad4-a4fe-6536d777a45f) [emergent technologies](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/42cb7669-c371-4903-9c0b-13db67b2e4bb) [information categorisation](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/93aaf65c-5aad-4e6f-a7ba-ce9bf7c0e6e6) [information extraction](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/696e3b5b-8b61-45af-ae4c-3ab700f197ec) [innovation processes](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/2fb8480e-de3c-462b-b169-e8bbb344da68) [query languages](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/9cf681c7-89ec-470c-b651-7fe03786f586) [resource description framework query language](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/99207709-d076-4cce-ba38-e90d3bb28806) [software frameworks](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/24c200e5-be20-4370-a137-ab53797f3a17) [unstructured data](https://esco.ec.europa.eu/en/classification/skills?uri=http://data.europa.eu/esco/skill/c5e8abde-d2ba-4e8e-a65e-720b71180666)