EKSAMENSBEVIS

Nicholas Hansen
Cpr-nr. 160901-6775

har den 30. juni 2024 gennemført

Bacheloruddannelsen i softwareudvikling

og har hermed ret til at betegne sig

Bachelor (BSc) i softwareudvikling

jf. Bekendtgørelse om universitetsuddannelser tilrettelagt på heltid (uddannelsesbekendtgørelsen), som fastsat af Uddannelses- og Forskningsministeriet i henhold til Universitetsloven.

Udskrift af eksamensprotokol, kompetenceprofil samt engelsksproget Diploma Supplement er vedlagt.

Per Bruun Brockhoff
Rektor

30. september 2024

EKSAMENSPROTOKOL

Bacheloruddannelsen i softwareudvikling

IT-Universitetet i København bekræfter hermed, at *Nicholas Hansen* (cpr-nr. 160901-6775) har bestået følgende studieaktiviteter:

Bedømmelses-dato	Studieaktivitet	7-trins-skala	ECTS skala	ECTS point	Eksamens-sprog[1]
2022-01-17	Projektarbejde og kommunikation	4	D	7.50	dansk
2022-02-02	Foundations of Computing - Discrete Mathematics	4	D	7.50	engelsk
2022-03-21	Grundlæggende programmering	4	D	15.00	dansk
2022-06-28	Algoritmer og datastrukturer	7	C	7.50	dansk
2022-06-30	User experience og webprogrammering	12	A	7.50	dansk
2022-06-30	Førsteårsprojekt: Danmarkskort. Visualisering, navigation, søgning og ruteplanlægning	02	E	15.00	engelsk
2023-01-26	Introduction to Database Systems	02	E	7.50	engelsk
2023-02-03	Distributed Systems	02	E	7.50	engelsk
2023-06-30	Funktionel programmering	02	E	7.50	engelsk
2023-07-05	Introduction to Artificial Intelligence	02	E	7.50	engelsk
2023-08-15	Andetårsprojekt: Softwareudvikling i større grupper	4	D	15.00	engelsk
2024-01-24	Security 1, BSc	02	E	7.50	engelsk
2024-01-25	Digital transformation og forretningsmodeller	02	E	7.50	dansk
2024-02-01	Analysis, Design and Software Architecture	10	B	15.00	engelsk
2024-02-03	Operating Systems and C	4	D	7.50	engelsk
2024-02-14	Programmer som data	7	C	7.50	dansk
2024-05-31	Bachelorprojekt: Computational Storage in the Context of the Daphne System	10	B	15.00	engelsk
2024-06-21	Foundations of Game AI	7	C	7.50	engelsk
2024-06-30	Reflektion over IT	7	C	7.50	engelsk

Samlet omfang af bestående studieaktiviteter: 180 ECTS-point. Hver aktivitet skal bestås for sig.
Svarende til 3 års studium på fuld tid.
Vægtet gennemsnit: 5.17, beregnet som gennemsnit af alle karaktergivne studieaktiviteter, vægtet efter ECTS point.

[1] IT-Universitetet har ikke altid oplysning om eksamenssprog ved eksaminer der er afholdt på andre universiteter.

Lene Rehder

Lene Rehder
Head of Student Affairs and Programmes
30. september 2024

DIPLOMA

Nicholas Hansen
Civil reg. no. 160901-6775

has on 30 June 2024 completed the programme

Bachelor of Science (BSc) in Software Development

and has obtained the right to use the title

Bachelor of Science (BSc) in Software Development

The degree has been awarded pursuant to the Ministerial Order on Bachelor's and Master's Degree Programmes at the Universities, as laid down by the Danish Ministry of Higher Education and Science pursuant to the Danish Act on Universities.

A transcript of the graduate's academic record is enclosed together with a Competence Profile and a Diploma Supplement.

Per Bruun Brockhoff
Rector

30 September 2024

TRANSCRIPT OF ACADEMIC RECORD

Bachelor of Science (BSc) in Software Development

The IT University of Copenhagen hereby confirms that *Nicholas Hansen* (civil. reg. no. 160901-6775) has successfully completed the following study activities:

Examination Date	Study Activity	7-point-scale	ECTS scale	ECTS credits	Examination Language[1]
2022-01-17	Project Work and Communication	4	D	7.50	Danish
2022-02-02	Foundations of Computing - Discrete Mathematics	4	D	7.50	English
2022-03-21	Introductory Programming	4	D	15.00	Danish
2022-06-28	Algorithms and Data Structures	7	C	7.50	Danish
2022-06-30	User experience og webprogrammering	12	A	7.50	Danish
2022-06-30	First-year Project: Map of Denmark. Visualization, Navigation, Searching, and Route Planning	02	E	15.00	English
2023-01-26	Introduction to Database Systems	02	E	7.50	English
2023-02-03	Distributed Systems	02	E	7.50	English
2023-06-30	Functional Programming	02	E	7.50	English
2023-07-05	Introduction to Artificial Intelligence	02	E	7.50	English
2023-08-15	Second Year Project: Software Development in Large Teams	4	D	15.00	English
2024-01-24	Security 1, BSc	02	E	7.50	English
2024-01-25	Digital Transformation and Business Models	02	E	7.50	Danish
2024-02-01	Analysis, Design and Software Architecture	10	B	15.00	English
2024-02-03	Operating Systems and C	4	D	7.50	English
2024-02-14	Programs as Data	7	C	7.50	Danish
2024-05-31	Bachelor Project: Computational Storage in the Context of the Daphne System	10	B	15.00	English
2024-06-21	Foundations of Game AI	7	C	7.50	English
2024-06-30	Reflections on IT	7	C	7.50	English

Total number of credits earned: 180 ECTS-points. Each activity must be passed separately.
Corresponding to 3 years of full time studies.
Weighted average: 5.17, calculated as the average of all marks awarded for passed study activities weighted by ECTS credits.

[1] The IT University does not always have information on the examination language for examinations passed at other universities.

Lene Rehder

Lene Rehder
Head of Student Affairs and Programmes

30 September 2024

KOMPETENCEPROFIL

Kompetenceprofil for: *Nicholas Hansen*, f. 16. september 2001.
Uddannelse: Bacheloruddannelsen i softwareudvikling

Viden og forståelse

- Bacheloren har forskningsbaseret viden om teori, metode og praksis inden for de datalogiske områder: programmeringssprog, softwarearkitektur, algoritmer, datastrukturer, operativsystemer, databaser, distribuerede systemer og brugergrænseflader.
- Bacheloren har forskningsbaseret viden om teori, metode og praksis inden for software engineering områderne: kravspecifikation, software arkitektur og kvalitetssikring og test.
- Bacheloren kan forstå og reflektere over teori, videnskabelig metode og praksis inden for de ovenstående områder.
- Bacheloren har forskningsbaseret viden om teori, metode og praksis inden for systemudvikling, projektorganisering og forretningsprocesser og kan forstå og reflektere over teori, videnskabelig metode og praksis inden for disse områder.

Færdigheder

- Bacheloren behersker moderne programmeringssprog og -platforme og kan anvende gængse redskaber, notationer og metoder i softwareudviklingsprojekter.
- Bacheloren kan skrive veldokumenteret og pålidelig software.
- Bacheloren kan designe effektive brugergrænseflader.
- Bacheloren kan selvstændigt designe avancerede algoritmer og datastrukturer og analysere kvalitetsfaktorer såsom tids- og hukommelsesforbrug.
- Bacheloren kan designe og udvikle moderne software- og databasearkitekturer, der opfylder givne krav.
- Bacheloren kan designe og udvikle distribuerede og netværksbaserede softwaresystemer.
- Bacheloren kan medvirke til alle faser af softwareudvikling, fra forundersøgelse og kravspecifikation til brugertest og idriftsættelse, og har erfaring med dette fra projekter i uddannelsen.
- Bacheloren kan formidle informationsteknologiske problemstillinger og løsningsmodeller effektivt med brugere, kolleger og andre interessenter.

Kompetencer

- Bacheloren kan beskrive og tilgodese den forretningsmæssige og organisatoriske kontekst for et softwareudviklingsprojekt.
- Bacheloren kan bruge teori til at styrke egen praksis og til at reflektere over egne erfaringer.
- Bacheloren har grundlæggende viden om den samfundsmæssige og organisatoriske kontekst for et softwaresystem og kan redegøre for dets etiske, juridiske, og sociale konsekvenser.
- Bacheloren kan vedligeholde og udvikle sine faglige og professionelle kompetencer.
- Bacheloren kan samarbejde med andre, også i internationale, distribuerede projekter og på tværs af kulturelle skel.

COMPETENCE PROFILE

Competence profile for: *Nicholas Hansen*, b. 16 September 2001
Programme: Bachelor of Science (BSc) in Software Development

Knowledge and Understanding

- The bachelor has a research-based knowledge of theory, method and practice in the following computer science areas: programming, software architecture, algorithms, data structures, operating systems, databases, distributed systems, and user interfaces.
- The bachelor has a research-based knowledge of theory, method and practice of the following software engineering areas: requirements analysis and specification, software architecture and quality assurance, and testing.
- The bachelor must be able to understand and reflect on theory, scientific method, and practice of the above areas.
- The bachelor has a research-based knowledge of theory, method and practice of system development, project management, and business processes, and understand and reflect on theory, scientific method, and practice of these areas.

Skills

- The bachelor must be able to master modern programming languages and platforms and must be able to use common tools, notation conventions and methods in software development projects.
- The bachelor must be able to write well documented and reliable software.
- The bachelor can design efficient user interfaces.
- The bachelor can independently design advanced algorithms and data structures, and analyse quality factors such as time and memory consumption.
- The bachelor can design and develop modern software and database architectures that meet the given requirements.
- The bachelor can design and develop distributed and networked software systems.
- The bachelor can take part in all phases of software development, from feasibility study and specification of requirements for user testing and implementation, and have experience with this from project work in the study programme.
- The bachelor can communicate information technology issues and solutions effectively with users, colleagues, and other stakeholders.

Competences

- The bachelor can describe and take into account the business and organisational context of a software development project.
- The bachelor can use theory to improve their own practice and to reflect on their own experiences.
- The bachelor has basic knowledge about the social and organisational context of a software system and can account for its ethical, legal, and social consequences.
- The bachelor can maintain and develop his or her technical and professional skills.
- The bachelor can collaborate with others, including in international, distributed projects and across cultural divides.

DIPLOMA SUPPLEMENT

This Diploma Supplement follows the model developed by the European Commission, Council of Europe and UNESCO/CEPES. The purpose of the supplement is to provide sufficient independent data to improve the international "transparency" and fair academic and professional recognition of qualifications (diplomas, degrees, certificates etc.). The supplement is designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended.

1. Holder of the Qualification

Family name(s): Hansen
Given name(s): Nicholas
Date of birth: 16 September 2001
Civil registration number: 160901-6775

2. The Qualification

Name of the qualification and title conferred

In Danish Bachelor (BSc) i softwareudvikling

In English Bachelor of Science (BSc) in Software Development

Date of award: 30 June 2024

2.1. Main fields of study

The Bachelor of Science programme in Software Development consists of the following main fields of study: Programming, Users Interface Design, Communication Skills, Algorithms and Data Structures, Software Design, Analysis and Architecture, Distributed Systems, Data Bases, Software Development Processes, Operating Systems, Compilers and Interpreters, and Business Processes and Organization.

2.2. Name and status of awarding institution

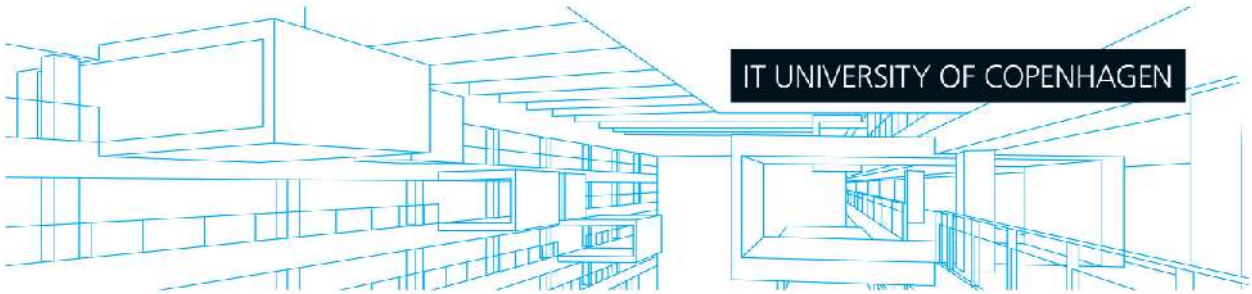
In Danish IT-Universitetet i København

In English IT University of Copenhagen

The IT University of Copenhagen is a state-recognised and state-financed higher education institution, which is regulated according to the Danish Act on Universities No. 754 of 17 June 2010.

2.3. Language(s) of instruction/examination

The language of instruction and examination is primarily Danish. Some courses are taught in English. If a course has been taught in English, the examination is usually also conducted in English.



3. Level of the Qualification

3.1. Level of qualification

First-cycle research-based qualification, normally requiring a total of 3 years of full-time higher education studies.

3.2. Official duration of programme in credits

3 years = 180 ECTS credits

The European Credit Transfer System (ECTS) is designed to help students and institutions in the European Union and other countries to compare degrees and study activities at universities and other higher education institutions. The workload per full academic year corresponds to 60 ECTS credits.

3.3. Access requirements

Admittance to the Bachelor's programme requires that the applicant has completed an upper secondary education, with the following specific entry requirements:- A-level (advanced level in Danish), A-level (advanced level) in mathematics, with a minimum average mark of 7 (ECTS-scale: C), B-level (intermediate level) in English, with a minimum average mark of 7 (ECTS-scale: C)

4. Contents and Results Gained

4.1. Mode of study

Full-time undergraduate programme equivalent of 180 ECTS credits (equivalent of 3 years full-time study).

4.2. Programme learning outcomes

A graduate from the Bachelor of Science programme in Software Development must be able to

- independently contribute to all phases of software development in teams, from feasibility studies and requirements specification, through to test and deployment.
- display a broad and well-founded knowledge within software development and IT systems,
- independently evaluate, choose and apply relevant theories and methods.

The programme consists of courses (a total of 135 ECTS credits), projects (a total of 30 ECTS credits) and is concluded with a Bachelor Project (a total of 15 ECTS credits).

4.3. Programme details and individual grades/marks/credits obtained

Please refer to the enclosed transcript of the graduate's academic record. The IT University of Copenhagen uses the ECTS credit point system to directly relate our study activities to those at international universities. A study activity is either a course, a project or a bachelor's dissertation. A course of 7.5 ECTS credits typically stretches over 12 weeks and demands a weekly workload of 15 hours.

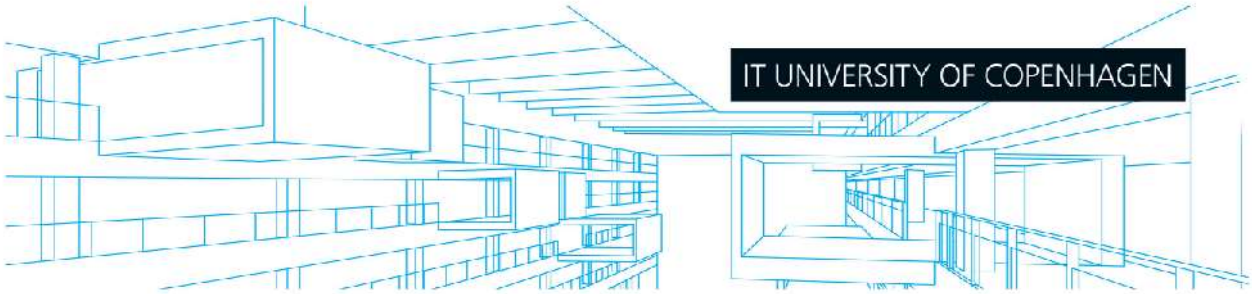
4.4. Grading scheme and (if applicable) grade distribution information

Please refer to the explanation of the grading scale on the final page.

4.5. Overall classification of the qualification

Not applicable for Danish qualifications.

5. Function of the Qualification



5.1. Access to further study

A completed Bachelor's degree in Software Development gives general access to Master of Science studies (second cycle). Specific admission is subject to institutional approval.

5.2. Access to regulated profession

The Bachelor's programme in Software Development qualifies the graduate as software developer in a variety of positions, such as Game Developer, Software Developer, IT Consultant, IT Architect, IT Project Leader, Web Developer, Software Tester, IT Entrepreneur, and Database Manager.

6. Additional Information

6.1. Additional information

The degree has been awarded pursuant to the Ministerial order on bachelor- and master's programmes at the universities, as laid down by the Danish Ministry of Higher Education and Science pursuant to the Danish Act on Universities, and to the Curriculum for the Bachelor's Programme in Software Development of 1 September 2021.

6.2. Institutional information

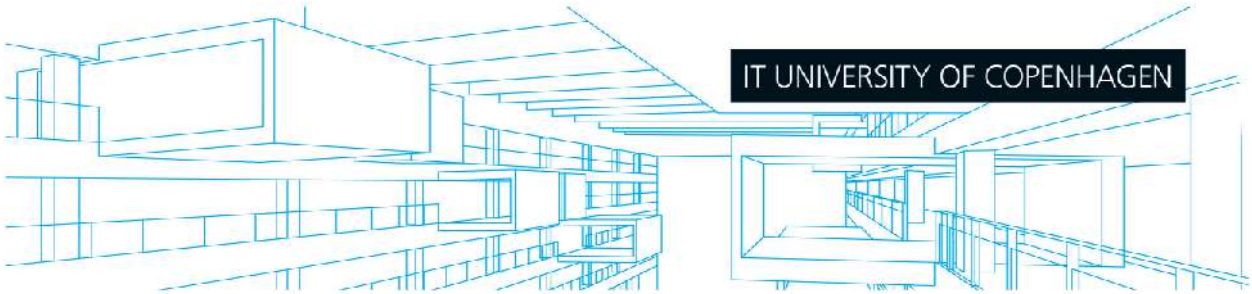
The IT University of Copenhagen is a teaching and research-based tertiary institution established in 1999 concerned with information technology (IT) and the opportunities it offers. It is funded to undertake both theoretical and applied research into the interaction and growing importance of information technology to society. The mission of the IT University of Copenhagen is to deliver internationally leading teaching and research which will enable Denmark to become exceptionally good at creating value with IT.

The IT University of Copenhagen conducts research in the fields of digital aesthetics and communication, theoretical computer science, innovation, and design and use of information technology. The IT University of Copenhagen offers PhD, Master of Science, Bachelor of Science, Master and Diploma programmes in the fields of Business, Digital Communication, Games and Software Development.

The teaching methods at the IT University of Copenhagen are varied and require a high degree of student activity. The teaching methods include lectures and projects - often in cooperation with private or public organisations - which in addition to developing the student's academic skills also develop the student's interpersonal skills.

6.3. Further information sources

Information in English about the IT University of Copenhagen (study programmes, course descriptions, number of students, research, organisation etc.) can be obtained from the IT University's homepage www.itu.dk, or from the Student Counsellors Office (e-mail: studentadvisors@itu.dk). General information about higher education in Denmark can be obtained from the following two homepages: Danish Ministry of Higher Education and Science (www.fivu.dk), and Danish Ministry of Children and Education (www.uvm.dk).



7. Certification of this Supplement

30 September 2024 — Lene Rehder

Date

Lene Rehder, Head of Student Affairs and Programmes

Official stamp:

Student Affairs and Programmes

The IT University of Copenhagen
Rued Langgaards Vej 7
2300 Copenhagen S
Denmark
www.itu.dk
sap@itu.dk

8. Information on the Danish Higher Education System

Cf. enclosure The Danish Higher Education System (April 2016)

The Danish Higher Education System

April 2016

Public higher education institutions in Denmark are regulated by national legislation concerning degree structures, teacher qualifications and examinations. Accreditation in higher education is undergoing transition from programme-based accreditation to institutional accreditation. Programmes and institutions are accredited by national, independent accreditation agencies and the Accreditation Council.

Higher education institutions

Higher education is offered by five types of higher education institutions:

1. Business academies (Erhvervsakademi) offering professionally oriented short cycle and first cycle degree programmes.
2. University Colleges (Professionshøjskole) offering professionally oriented first cycle degree programmes.
3. Maritime Education and Training Institutions offering professionally oriented short cycle and first cycle degree programmes.
4. General and specialised research universities (Universitet) offering first, second and third cycle degree programmes in academic disciplines.
5. University level institutions offering first, second and third cycle degree programmes in subject fields such as architecture, design, music, and fine and performing arts.

Most higher education institutions are regulated by the Ministry of Higher Education and Science (type 1-5). The Ministry of Culture regulates a number of higher education institutions offering programmes within fine and performing arts (type 5).

Degrees in the Danish Higher Education System:

Danish qualifications levels	**Ordinary higher education degrees**	**Adult / continuing higher education degrees**	**Qualifications Framework for the European Higher Education Area - Bologna Framework**	**European / National Qualifications Framework for Lifelong Learning - EQF/NQF**
Academy Profession level	Academy Profession (AP) degree (90-150 ECTS)	Academy Profession (AP) degree (60 ECTS) (also known as Further Adult Education (VVU) degree)	Short cycle	Level 5
Bachelor's level	Professional Bachelor's degree (180-270 ECTS)*	Diploma degree (60 ECTS)	First cycle	Level 6
	Bachelor's degree (within the arts) (180 ECTS)			
	Bachelor's degree (180 ECTS)			
Master's level	Master's degree (within the arts) (120-180 ECTS)	Master degree (60-90 ECTS)	Second cycle	Level 7
	Master's degree (120 ECTS)**			
PhD level	PhD degree (180 ECTS)		Third cycle	Level 8

* Can be obtained through a full regular bachelor's programme (180-270 ECTS) or a top up bachelor's programme following an Academy Profession degree. ** A few Master's programmes are up to 180 ECTS.

Higher education institutions measure study activities in ECTS credits. 60 ECTS correspond to one year full-time study.

Qualifications framework

The qualification levels form the basis for the Danish National Qualifications Framework for Higher Education, which is certified in accordance with the overarching Bologna Framework according to the principles adopted by the European Ministers of Higher Education. Danish higher education qualifications at levels 5-8 of the Danish Qualifications Frame-work for Lifelong Learning (NQF) correspond with levels 5-8 of the European Qualifications Framework (EQF).

Admission and progression

General access to higher education in Denmark requires an Upper Secondary School Leaving Certificate or comparable qualifications. Admission to some particular programmes requires entrance examination or submission of a portfolio of artistic work. Holders of an Academy Profession degree can obtain a Professional Bachelor's degree within the same field of study through a top-up programme. Completion of a first cycle degree qualifies students for admission to the second cycle.

Danish Ministry of Higher Education and Science

Ordinary Higher Education degrees

The Academy Profession degree is awarded after 90-150 ECTS and includes a period of work placement of at least 15 ECTS. The programmes are development-based and combine theoretical studies with a practical approach. Programmes are, among others, offered within Marketing Management, Computer Science and Chemical and Biotechnical Science. The Danish title is field of study followed by the abbreviation AK and the English title is AP Graduate in [field of study].

The Professional Bachelor's degree is awarded after 180-270 ECTS and includes a period of work placement of at least 30 ECTS. The programmes are applied programmes. They are development-based and combine theoretical studies with a practical approach. Examples of professional bachelor's degree holders are nurses, primary and lower secondary school teachers and certain types of engineers. The Danish title is Professionsbachelor i [field of study] and the English title is Bachelor of [field of study].

The Bachelor's degree from a university is awarded after 180 ECTS. The programmes are research-based and are offered in all scientific fields. The Danish title is Bachelor (BA) i [field of study] or Bachelor (BSc) i [field of study] and the English title is Bachelor of Arts (BA) in [field of study] or Bachelor (BSc) of Science in [field of study].

The Bachelor's degree (within the arts) is awarded after 180 ECTS. The programmes are based on research and artistic research. Programmes are offered within the fine arts. The Danish title is Bachelor (BA) i [field of study], Bachelor i musik (BMus) [field of study] or Bachelor i billedkunst (BFA) [field of study] and the English title is Bachelor of Arts (BA) in [field of study], Bachelor of Music (BMus) [field of study] or Bachelor of Fine Arts (BFA) in [field of study]. A higher education degree within theatre or filmmaking is awarded after 3-4 years of study (180-240 ECTS).

The Master's degree is awarded after 120 ECTS. The programmes are research-based and are offered in all scientific fields. The Danish title is abbreviated to Cand.[latin abbreviation of academic area] i [field of study]. The English title is Master of Arts (MA) in [field of study] or Master of Science (MSc) in [field of study].

The Master's degree (within the arts) is awarded after 120-180 ECTS. The programmes are based on research and artistic research. The Danish title is abbreviated to Cand.[latin abbreviation of academic area] [field of study]. The English title is Master of Arts (MA) in [field of study], Master of Music (MMus) [field of study] or Master of Fine Arts (MFA) in [field of study]. Music Academies offer a specialist degree of 2 to 4 years following the master's degree.

The PhD degree is awarded after 180 ECTS. PhD programmes are offered by the universities and some university level institutions offering degrees in the artistic and cultural field.

Detailed descriptions of degree levels can be found in the Danish Qualifications Framework at www.nqf.dk. Please consult the relevant Diploma Supplement for information about the learning outcome of any specific degree.

Adult and continuing higher education

The programmes normally consist of 2 years of part-time study, equivalent to 1 year of full-time study (60 ECTS credits). Certain master programmes require 1½ years of full-time study (90 ECTS credits). Admission requirements are a relevant educational qualification and at least 2 years of relevant work experience.

Adult and continuing education is available at levels corresponding to qualifications of the ordinary higher education system.

- The Further Adult Education degree (videregående voksenuddannelse/akademiuddannelse) is awarded after studies at short cycle level and gives access to diploma programmes.
- The Diploma degree (diplomuddannelse) is awarded after studies at first cycle level and gives access to master programmes.
- The Master degree (masteruddannelse) is awarded after studies at second cycle level.

The 7 point grading scale

The grading system used in all state-regulated education programmes as of September 2007 is the 7-point grading scale. Apart from the 7-point grading scale, pass/fail assessment may also be used. 02 is the minimum grade for passing an exam.

Description of grades: **12**: For an excellent performance displaying a high level of command of all aspects of the relevant material, with no or only a few minor weaknesses; **10**: For a very good performance displaying a high level of command of most aspects of the relevant material, with only minor weaknesses; **7**: For a good performance displaying good command of the relevant material but also some weaknesses; **4**: For a fair performance displaying some command of the relevant material but also some major weaknesses; **02** For a performance meeting only the minimum requirements for acceptance; **00**: For a performance which does not meet the minimum requirements for acceptance; **-3** For: a performance which is unacceptable in all respects.