# The current context of Computer Science

## MODULE 1 / UNIT 3 / 0.5

MOISES M. MARTINEZ

FUNDAMENTALS OF COMPUTER ENGINEERING

2025/2026
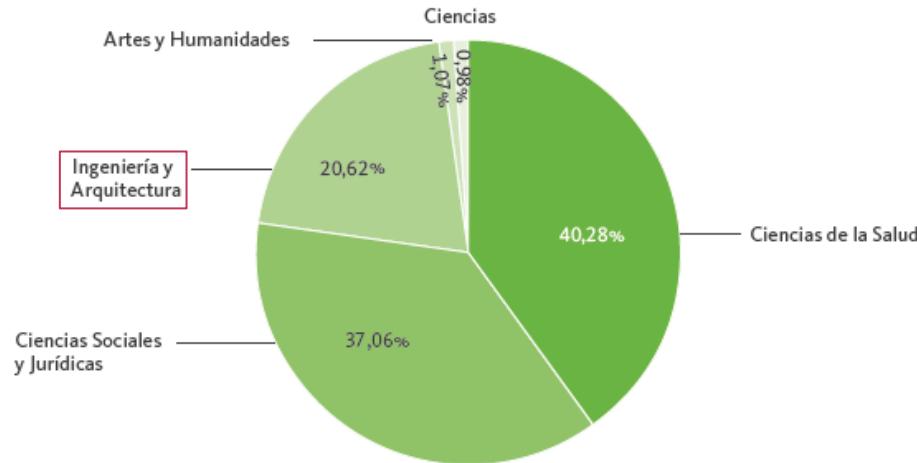
What is the current employment situation within our industry?

# A Global Perspective
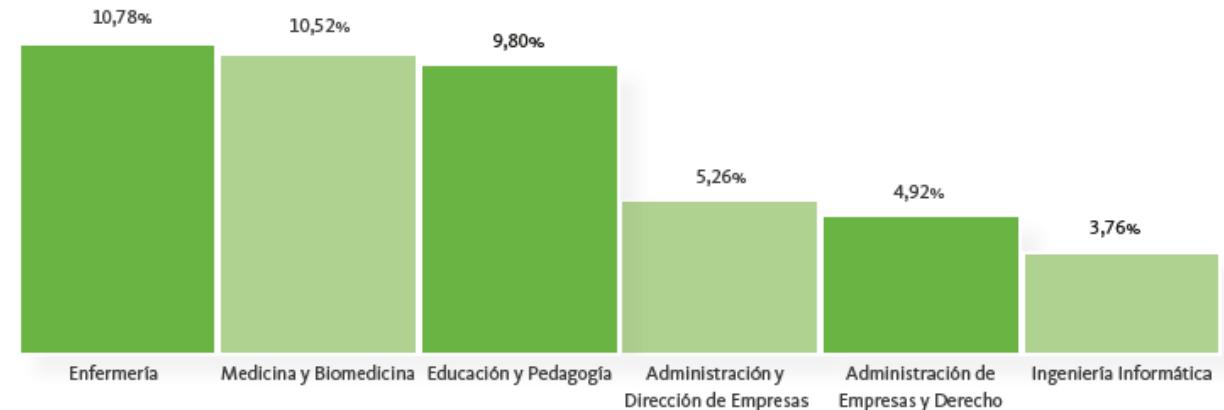
01

## What is happening in Spain?

Distribución de la oferta de empleo para titulados universitarios según rama de conocimiento

Ciencias 0,98%
Artes y Humanidades 1,07%
Ingeniería y Arquitectura 20,62%
Ciencias de la Salud 40,28%
Ciencias Sociales y Jurídicas 37,06%

Carreras universitarias más buscadas por las empresas

Enfermería 10,78%
Medicina y Biomedicina 10,52%
Educación y Pedagogía 9,80%
Administración y Dirección de Empresas 5,26%
Administración de Empresas y Derecho 4,92%
Ingeniería Informática 3,76%

Three years after the start of the pandemic, the option of **remote work remains**, although in most cases it is combined with in-person work in a hybrid format.

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## What is happening in Spain?

Digital transformation has led to an enhanced employability landscape in the wake of the pandemic.

| | |
|---|---|
| Comercial y Ventas | 47,92 % |
| Ingeniería y Producción | 33,33 % |
| Administración y Servicios Generales | 31,25 % |
| Atención al Cliente | 27,08 % |
| Tecnología, Informática y Telecomunicaciones | 14,58 % |
| Marketing, Comunicación y Contenidos | 14,58 % |
| Inteligencia de Negocio y Big Data | 6,25 % |
| Recursos Humanos | 6,25 % |
| Calidad, I+D, PRL y Medio Ambiente | 6,25 % |
| Legal | 6,25 % |
| Compras, Logística y Transporte | 4,17 % |
| Dirección General y/o Gerencia | 2,08 % |
| Diseño y maquetación | 0,00 % |

**If a company make new hires, in which functional areas will they be?**

| | 2022 | | 2021 | |
|---|---|---|---|---|
| Titulación universitaria | Ofertas (1) | Ofertas (2) | Ofertas (1) | Ofertas (2) |
| Enfermería | 10,78 % | 4,02 % | 12,42 % | 4,52 % |
| Medicina y Biomedicina | 10,52 % | 3,92 % | 13,41 % | 4,88 % |
| Educación y Pedagogía | 9,80 % | 3,66 % | 1,95 % | 0,71 % |
| Administración y Dirección de Empresas | 5,26 % | 1,96 % | 5,36 % | 1,95 % |
| Administración de Empresas y Derecho | 4,92 % | 1,83 % | 5,18 % | 1,89 % |
| Ingeniería Informática | 3,76 % | 1,40 % | 3,40 % | 1,24 % |
| Psicología y Psicopedagogía | 2,70 % | 1,01 % | 1,96 % | 0,71 % |
| Ingeniería Industrial | 2,50 % | 0,93 % | 3,50 % | 1,27 % |
| Fisioterapia | 2,31 % | 0,86 % | 2,42 % | 0,88 % |
| Ingeniería de Telecomunicaciones | 1,63 % | 0,61 % | 1,20 % | 0,44 % |
| Ciencias del Trabajo, Relaciones Laborales y Recursos Humanos | 1,47 % | 0,55 % | 1,79 % | 0,65 % |
| Comercio y Marketing | 1,41 % | 0,53 % | 2,03 % | 0,74 % |
| Economía | 0,91 % | 0,34 % | 1,25 % | 0,46 % |
| Ingeniería Eléctrica | 0,89 % | 0,33 % | 0,73 % | 0,27 % |
| Ingeniería en Geomática y Topografía | 0,75 % | 0,28 % | 0,41 % | 0,15 % |
| Ingeniería Mecánica | 0,73 % | 0,27 % | 0,98 % | 0,36 % |
| Ingeniería Civil | 0,60 % | 0,22 % | 0,51 % | 0,19 % |
| Ingeniería en Electrónica Industrial y Automática | 0,58 % | 0,22 % | 0,63 % | 0,23 % |
| Ingeniería Electromecánica | 0,56 % | 0,21 % | 0,39 % | 0,14 % |
| Arquitectura | 0,53 % | 0,20 % | 0,38 % | 0,14 % |
| Sin especificar temática específica de la titulación universitaria | 31,85 % | 11,88 % | 32,15 % | 11,71 % |
| Otras titulaciones | 5,53 % | 2,56 % | 7,94 % | 4,11 % |

(1) % sobre las ofertas de empleo que piden titulados universitarios
(2) % sobre el total de las ofertas de empleo

*Informe Infoempleo Adecco 2022*

**Most In-Demand University Degrees in Job Listings**
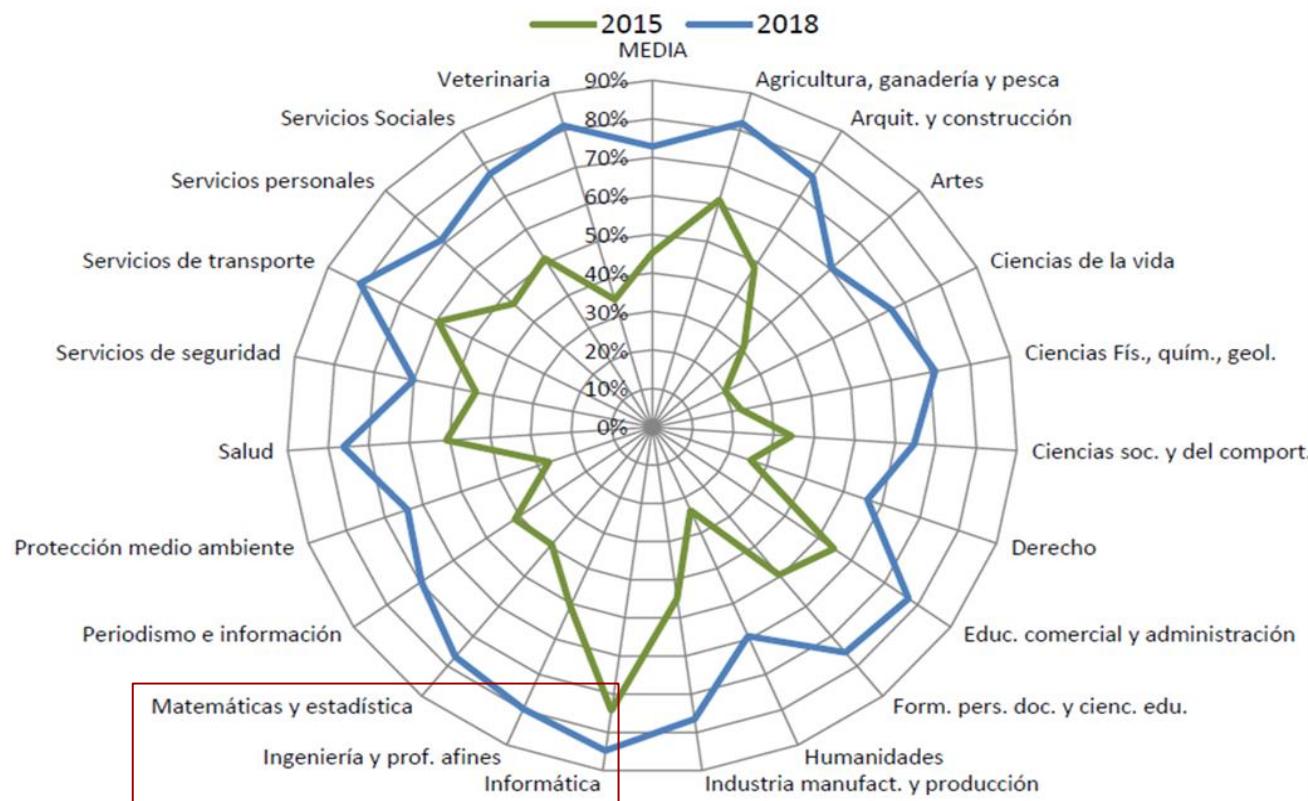
**OFF-EXAM CONTENT**

## How Computer Science Jobs Are Distributed in Spain?

| Sector | 2022 | | 2021 | | Aumento dentro del sector | Aumento dentro del global de oferta |
|---|---|---|---|---|---|---|
| | % sobre TIC | %sobre España | % sobre TIC | %sobre España | | |
| Informática | 50,88 % | 5,03 % | 47,85 % | 4,09 % | 3,03 % | 0,94 % |
| Telecomunicaciones | 22,18 % | 2,19 % | 22,77 % | 1,95 % | -0,58 % | 0,25 % |
| Consultoría Informática/Telecomunicación | 21,28 % | 2,10 % | 18,11 % | 1,55 % | 3,17 % | 0,56 % |
| Internet | 4,00 % | 0,40 % | 10,05 % | 0,86 % | -6,05 % | -0,46 % |
| Equipamiento y Distrib. Informática | 1,47 % | 0,15 % | 1,01 % | 0,09 % | 0,46 % | 0,06 % |
| Multimedia | 0,19 % | 0,02 % | 0,22 % | 0,02 % | -0,03 % | 0,00 % |

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## What is happening in Spain?



Employability is increasing in areas related to computer science due to the demand for specialists.

- Maths.
- Statistics.
- Physics.
- Data Science.
- Artificial Intelligence.

## What is happening in Spain?

AWS launched new Region in Spain by mid-2022



New Google Cloud region in Madrid, Spain now open

Google Cloud



Meta will create 2,000 jobs in five years and open a new data centre (a Meta lab), in Castile-La Mancha.

## What is happening in Europe?



**Proportion of ICT specialists in total employment, 2023**
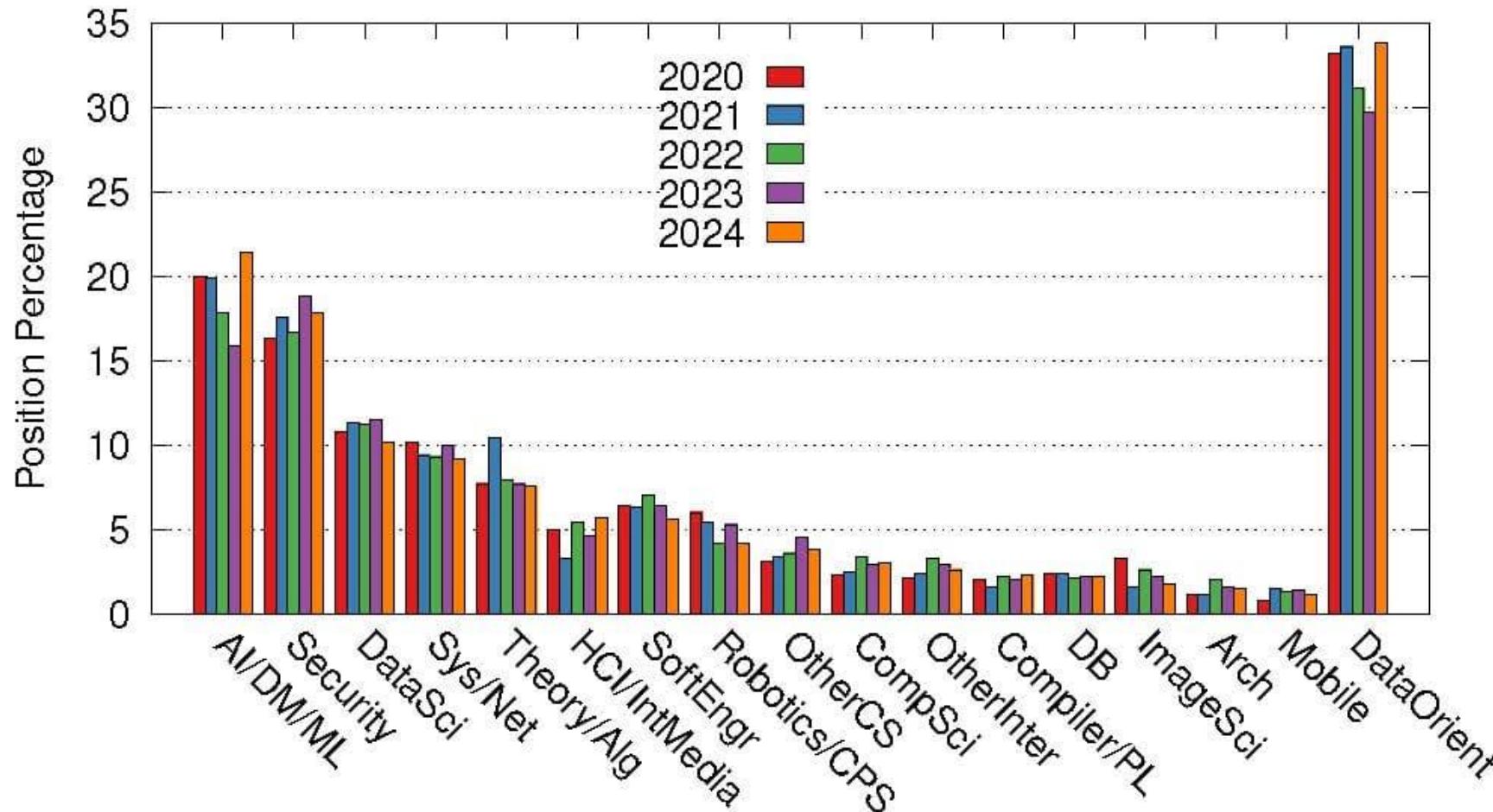
Information and Communication Technology (ICT)

eurostat

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## What is happening in the world?
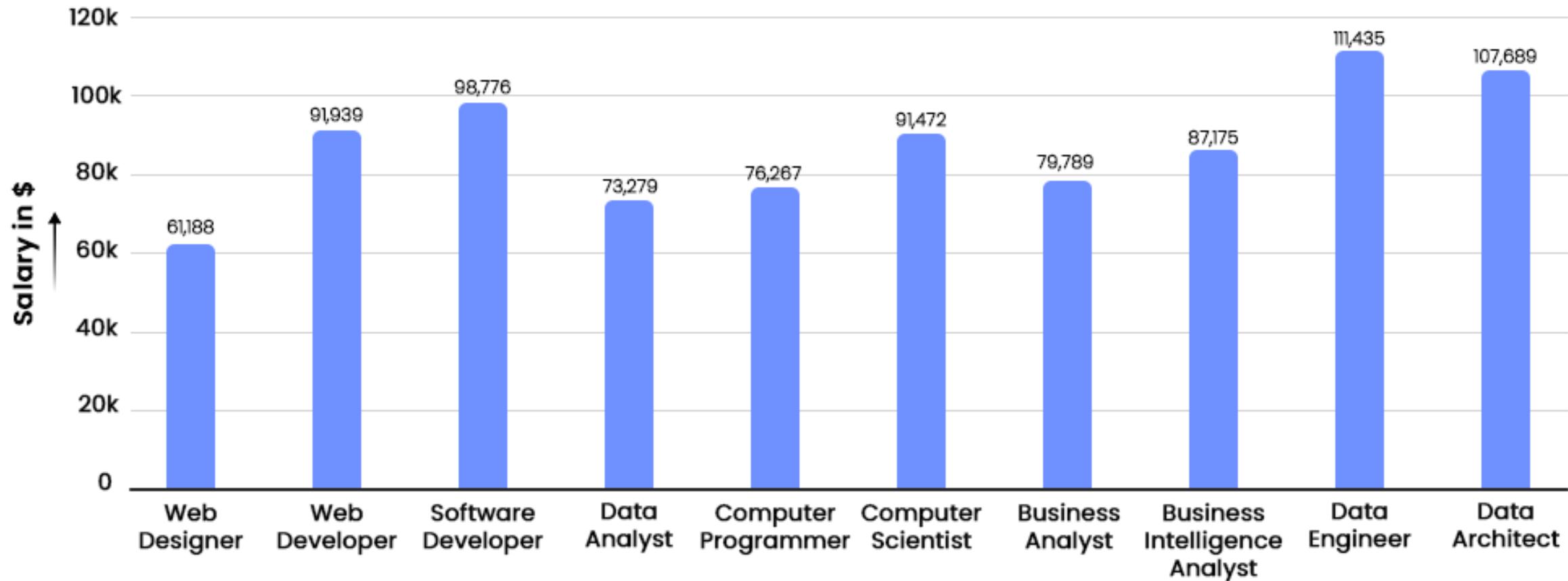


**Future Computer Science Needs**

CRA
Computing Research Association

## What is happening in the world?
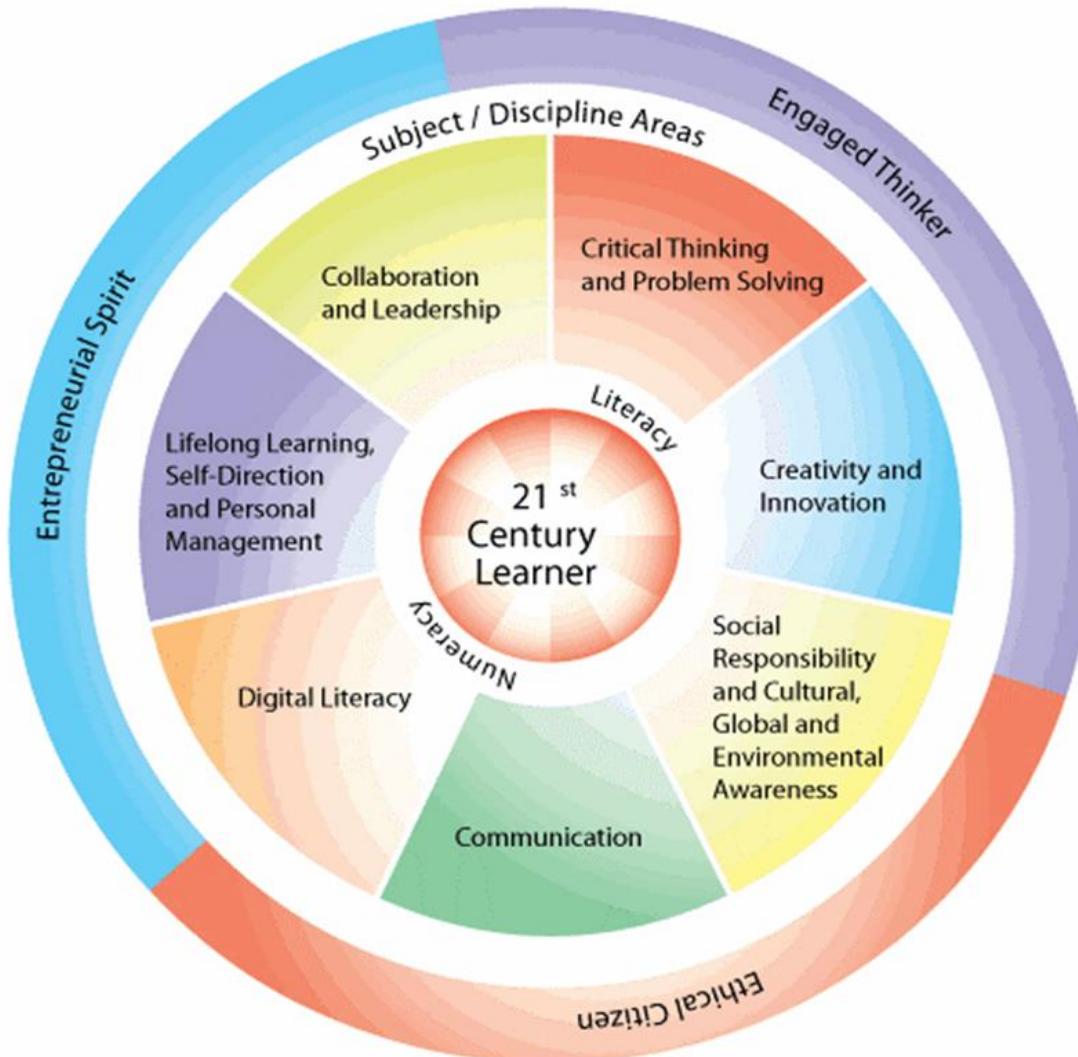
# The Curriculum Framework

# 02

# Which are the most important skills?

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**OFF-EXAM CONTENT**

## Listening

⚠ **OFF-EXAM CONTENT**

## Negotiation



How to Reach Agreements
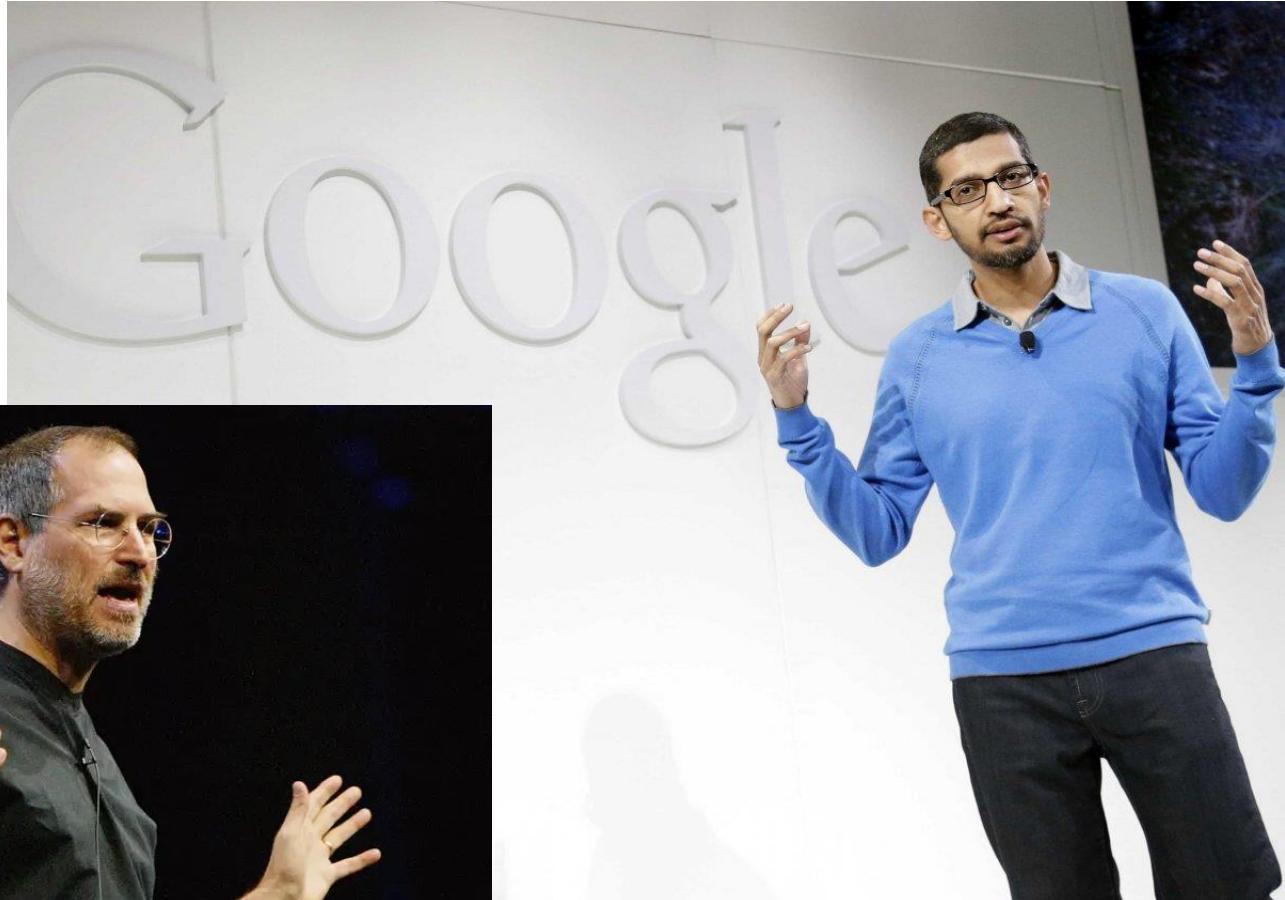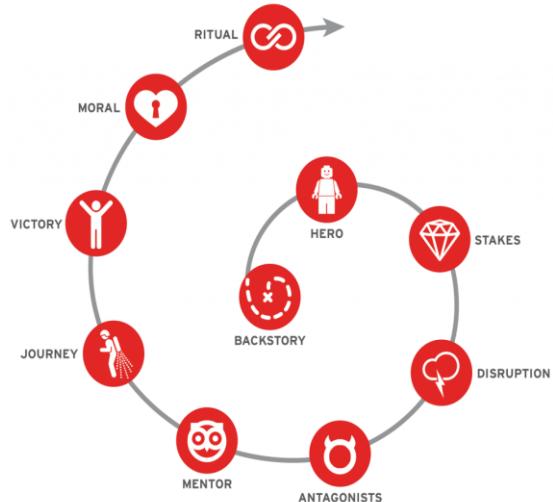
## Public speaking

**OFF-EXAM CONTENT**

## Storytelling

# The Curriculum Framework
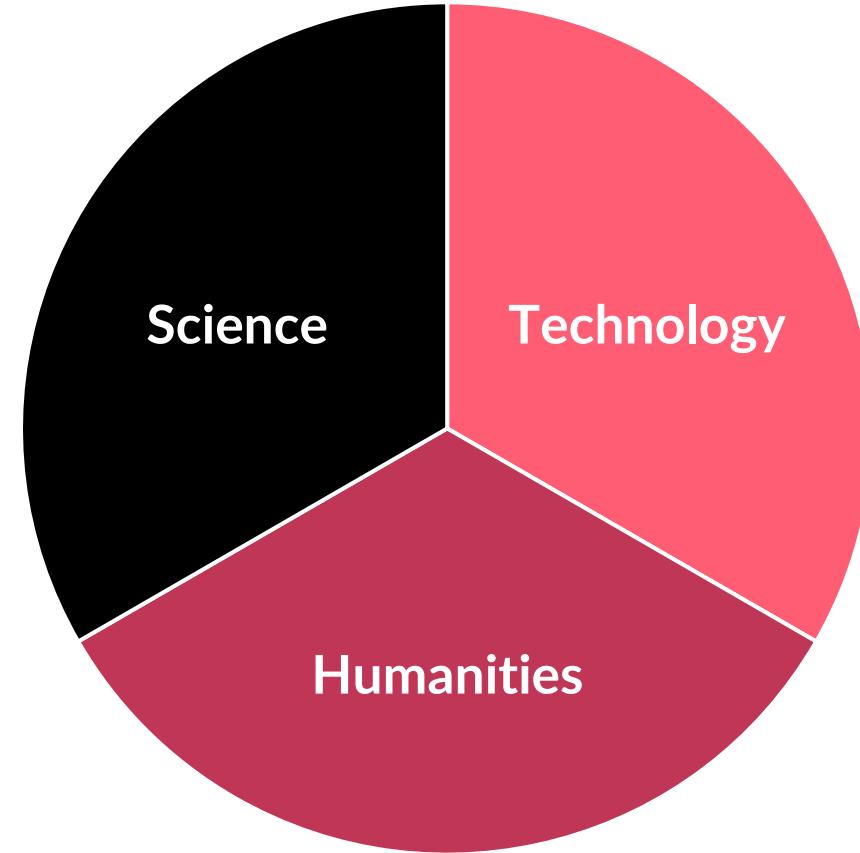
**What do you should learn?**
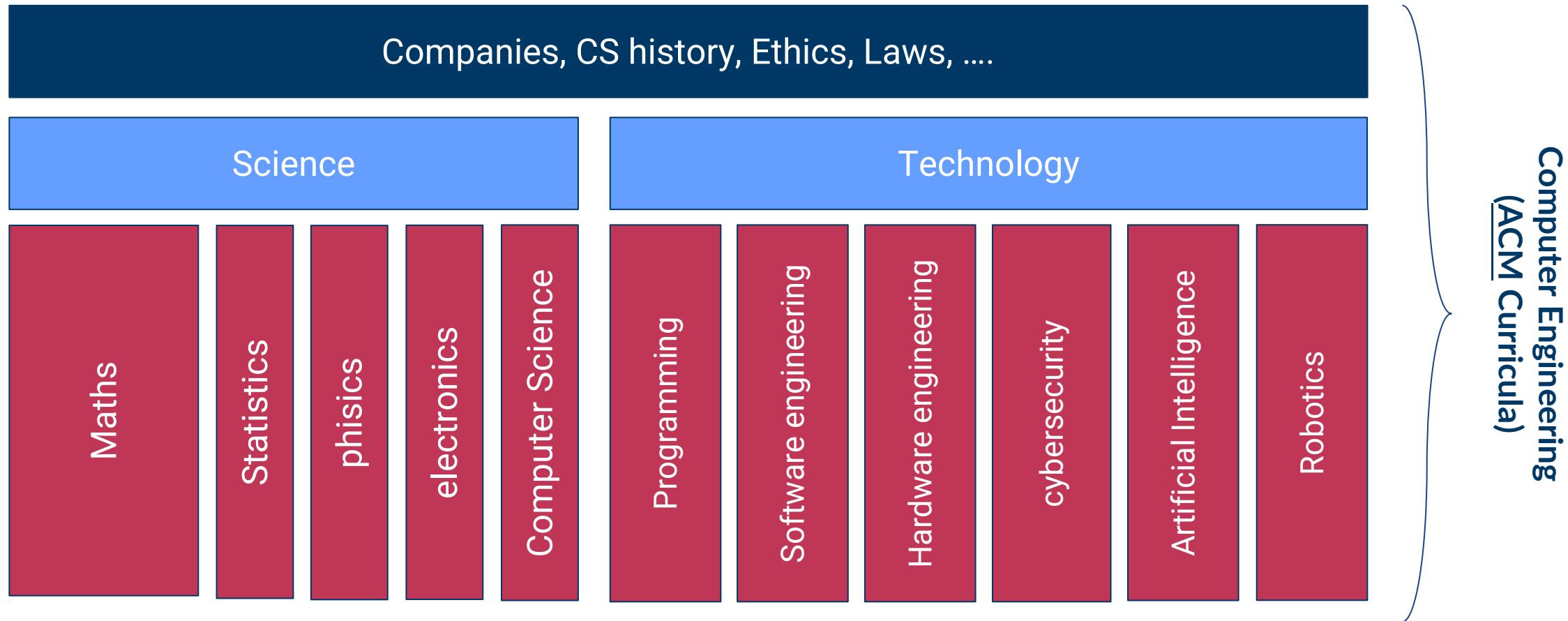
Theoretical
Knowledge

Productive
Knowledge



Practical Knowledge (soft skills)

# The Curriculum Framework

OFF-EXAM CONTENT

## What do you should learn? The ACM curricula



Companies, CS history, Ethics, Laws, ….

Science

Technology

Maths

Statistics

phisics

electronics

Computer Science

Programming

Software engineering

Hardware engineering

cybersecurity

Artificial Intelligence

Robotics

Computer Engineering (ACM Curricula)

# The Curriculum Framework

## What do you should learn? The UFV curricula

| Maths | Computer Science | Programming | Humanities |
|---|---|---|---|
| Discrete maths | Fundamentals of Computer Engineering | Practical Programming | Logic and Critical Thinking |
| Maths for engineering I | Electronic and computers | Oriented Object Programming | Person Management and Skills |
| Maths for engineering II | Companies and their processes | | History of Science and Technology |
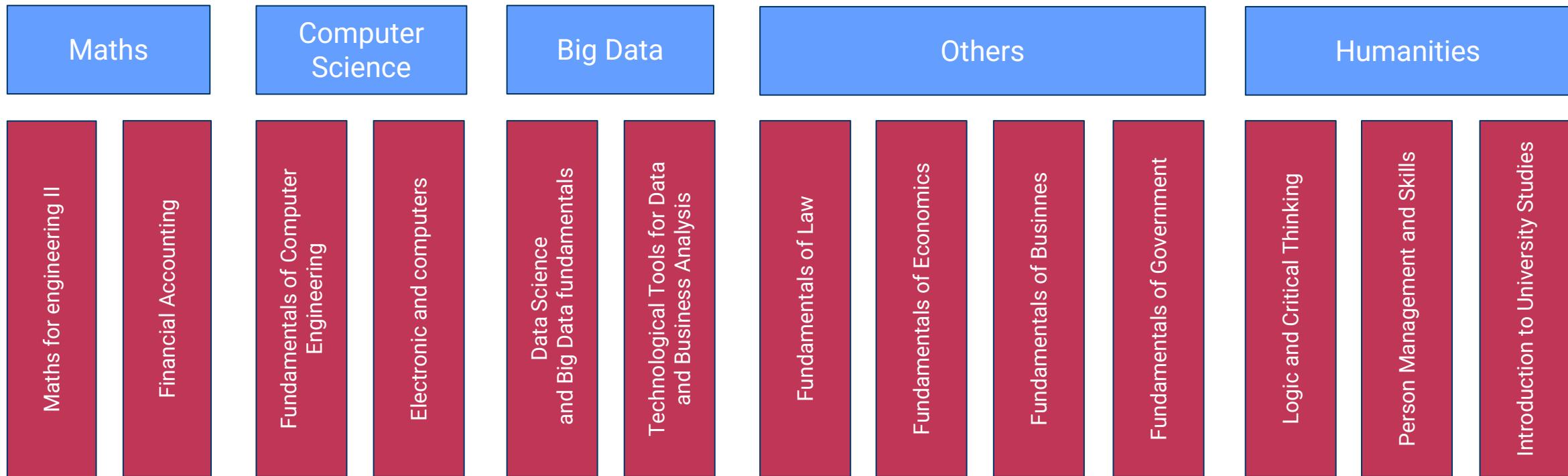
## Computer Engineering

# The Curriculum Framework

⚠ **OFF-EXAM CONTENT**

## What do you should learn? The UFV curricula

| Maths | Computer Science | Big Data | Others | Humanities |
|---|---|---|---|---|

| Maths for engineering II | Financial Accounting | Fundamentals of Computer Engineering | Electronic and computers | Data Science and Big Data fundamentals | Technological Tools for Data and Business Analysis | Fundamentals of Law | Fundamentals of Economics | Fundamentals of Businnes | Fundamentals of Government | Logic and Critical Thinking | Person Management and Skills | Introduction to University Studies |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

### Data and Business Analysis + Computer Engineering

# The Curriculum Framework

⚠ OFF-EXAM CONTENT

## What do you should learn? The UFV curricula

| Maths | | | | | | Computer Science | | | Humanities | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Algebra I | Algebra II | Calculus I | Calculus II | Discrete maths | Mathematical and Computational Logic | Fundamentals of Computer Engineering | Electronic and computers | Programming I | Logic and Critical Thinking | Person Management and Skills | Introduction to University Studies | Integrative Project I |
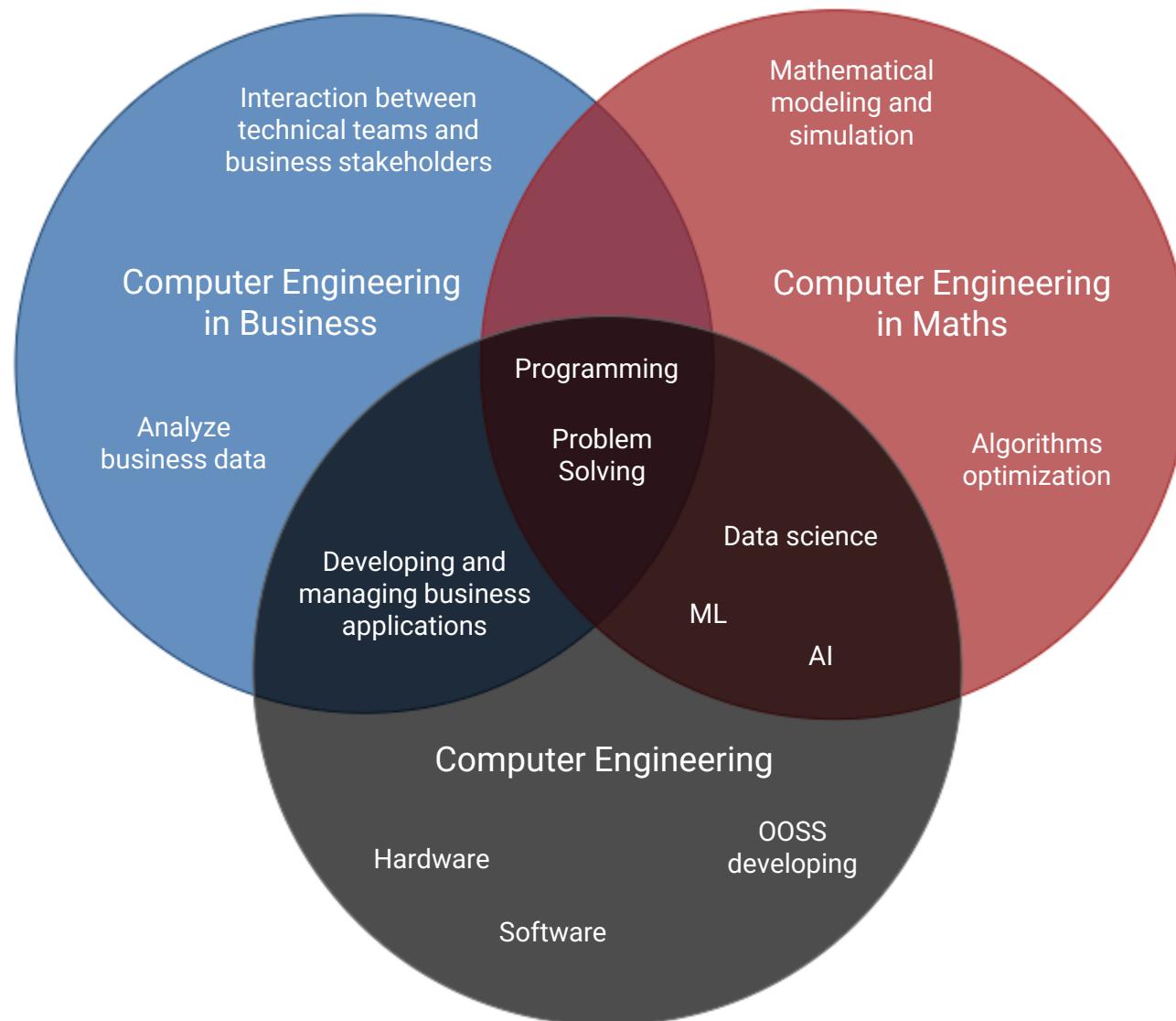
## Mathematical Engineering + Computer Engineering

# The Curriculum Framework

⚠ OFF-EXAM CONTENT

**Computer Engineering in Business**
- Interaction between technical teams and business stakeholders
- Analyze business data

**Computer Engineering in Maths**
- Mathematical modeling and simulation
- Algorithms optimization

**Computer Engineering**
- Hardware
- Software
- OOSS developing

- Programming
- Problem Solving
- Developing and managing business applications
- Data science
- ML
- AI

# Which is your profesional profile?

⚠ OFF-EXAM CONTENT

**A computer engineer …**

is an individual who contributes to the betterment of society, enhances the quality of life, and broadens the opportunities for a fulfilling existence through collaborative efforts in the development of IT solutions.

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⚠ OFF-EXAM CONTENT

**A computer engineer …**

is an individual who contributes to the betterment of society, enhances the quality of life, and broadens the opportunities for a fulfilling existence through collaborative efforts in the development of IT solutions.

**An individual who creates IT solutions to assist/help individuals or organizations.**

**⚠ OFF-EXAM CONTENT**

**A computer engineer …**

To ensure that technological progress preserves human values and favours the development of people and civilisations.

**Research**
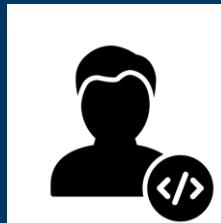
To ensure that technologies and systems drive the development of people and organisations.

**Consulting, innovation and development**

**Which is your professional profile?**

There are various methods to categorize the diverse profiles within the Technology Industry (TI) ...

| Tech | Manager | Expert | Researcher | Entrepreneur | Business |

You can work within some of these profiles or assume a leadership role in one of them; **it depends on your choices and abilities**.

**The UFV competencies ...**

- **Ethical and Human-Centric**: In the pursuit of their profession, these individuals are driven by a well-defined moral compass and a commitment to benefit others. Consequently, they align their actions, both in terms of goals and methods, with a people-centric approach.

- **Creativity and Innovation**: They do not confine themselves to familiar technologies and established procedures when addressing the present challenges of their clients. Instead, they prioritize the human aspect and possess the ability to innovate while seeking solutions, either by devising novel techniques and tools or by ingeniously amalgamating existing ones.

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**The UFV competencies …**

- **Curiosity and Self-Directed Learning:** They exhibit an unwavering curiosity, maintaining an ongoing quest for knowledge. They possess both the capability and inclination for continuous learning, consistently enhancing their skills and expertise to better address the requirements of their clients and society at large.

- **Collaboration and Interpersonal Aptitude:** They possess the capacity to engage effectively with others, particularly within their work teams, as well as with clients and suppliers. They actively encourage interactions and uphold values such as diversity, tolerance, and respect.

⚠ OFF-EXAM CONTENT

**The UFV competencies ...**

- **Leadership and Social Responsibility**: They possess the capability and readiness to serve as a catalyst for change and societal progress. Committed to their individual goals, those of their team, and their broader social context, they embrace a calling to serve and contribute to the common good. Their approach is marked by humility and integrity.

- **Personal Leadership and Excellence**: As the architects of their own lives, they are driven to take initiative and explore avenues for the realization of their personal life goals. This extends to their professional pursuits, where they align with their calling and strive for excellence.

# Where will you work?