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Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Syllabus
Course description

Course title	**Growth Mindset** **M1 Design Thinking and Prototyping** **M2 Algorithmic thinking Coding**
Course code	**25555**
Scientific sector	MODULE 1 – CEAR-08/D (former ICAR/13), MODULE 2 – IINF-05/A (former ING-INF/05)
Degree	LM 77 Master in Entrepreneurship and Innovation
Semester and academic year	1st semester 2025-2026
Year	1
Credits	14 (6 first MODULE, 8 second MODULE)
MODULEear	Yes

Short Description	**MODULE 1** Design Thinking is two decades old now. And in all these years we have understood something. The DT is not the solution to all problems. Why then is it increasingly popular? Communication agencies, personal coaches, big consulting groups why today everyone "does" Design Thinking? And even when the C-levels try to avoid it, perhaps by investing in another evocative name, they always find the same old story: post-it, games, the magic 4 steps taken from a manual written maybe on the other side of the world 20 years ago. Because being creative and innovative is the dream of every company. And when the company can't do it, because it is blocked by a thousand clutches, an automatic innovation distributor is ready at every corner, selling it ready-made at a low price. "Doing" Design Thinking becomes as easy as installing an app. But The DT is not an app to install. It's a new operating system. I will try to show through lectures and prominent case studies how Design Thinking is the perfect way to face complexity and to bring value to the companies. The competition is high. The rates are lowered. The quality as well. It becomes a war of meaningless terms that feeds on itself. **MODULE 2** This is a programming course particularly focused on coding and on how data are organized and handled by computers. Starting from the very basics of Python

	programming the students will get to learn the techniques for dealing with data, efficient algorithms and data structures. The course is strongly focused on practice, consisting of in very short theoretical sessions followed by several examples, exercises and assignments. This course gives future entrepreneurs and innovation managers a clear idea of how computer algorithms work, a knowledge which can help them better plan company's developments and potential innovations, in particular in the technological sector. Moreover, programming abilities gives access to job opportunities in the software development sector.
Total lecturing hours	**MODULE 1** – 36 hours, **MODULE 2** – 48 hours
Total lab hours	**MODULE 1 -** 16 hours
Total exercise hours	0
Attendance	**MODULE 1** Required at least 75% **MODULE 2** A continuous and regular attendance is suggested but not required. Intermittent attendance is strongly discouraged.
Prerequisites	**MODULE 1** not foreseen **MODULE 2** English understanding and reading at level B2. A basic course in computer science covering basic Microsoft Windows, file handling, Internet usage.
Course page	**MODULE 1+2** Course Offering - Enrolled from 2025 / Free University of Bozen-Bolzano

Specific educational objectives	The course refers to the basic educational activities and belongs to the scientific area of Economics. The course is designed to catch the idea that: Design is more than a feeling: It's analytical leadership more than a product: It's user experience more than a department: It's cross-functional talent more than a phase: It's continuous iteration The course is designed to acquire at the same time programming skill and a deep idea on how computers behave and usually handle problems.

MODULE 1	**Design Thinking and Prototyping**

Lecturer	- Silvia Sanasi silvia.sanasi@unibz.it
Scientific sector of the lecturer	ECON-07/A (former SECS-P/08)
Teaching language	English
Office hours	please refer to the lecturer's timetable
Lecturing assistant	None
Teaching assistant	None
Office hours	18
List of topics covered	Design Thinking Definitions, Methods and Application – product and service design, Value proposition canvas, Business Model Canvas, personas, Customer Journey, Creative Tools, Design Sprint, Lean Startup, Prototyping
Teaching format	Frontal lectures and group project work

MODULE 2	**Algorithmic thinking Coding**
Lecturer	Cristina Maria Gangai cristinamaria.gangai@unibz.it
Scientific sector of the lecturer	IINF-05/A (former ING-INF/05)
Teaching language	English
Office hours	please refer to the lecturer's timetable
Lecturing assistant	None
Teaching assistant	None
Office hours	24
List of topics covered	Basic Python programming, typical algorithms and data structures, computational complexity.
Teaching format	Frontal lectures in standard classroom with examples and exercises. Students use their own notebook, or a computer borrowed from the library and do home/in-lesson assignments, which will be corrected and commented together in the lessons.
Learning outcomes	**MODULE 1** The project will be based on the 3 pillars of the Design Thinking: Empathy, Strategy and Prototyping. Where with Empathy we mean how you look at people, how you identify the needs, how you get insights through understanding them. With strategy understanding the business model, process, and culture of the company (the client). And Prototyping which is the doing part of design thinking.

	MODULE 2 Knowledge and understanding: • knowledge of programming skills • knowledge and understanding of data structures • knowledge and understanding of algorithms Applying knowledge and understanding: • ability to organize and restructure data • ability to determine the complexity of algorithms Making judgments: • ability to choose the adequate tools or techniques while coding • ability to determine the difficulty level for data handling Communication skills: Ability to discuss technical and programming aspects of a project, and to effectively communicate the functioning of an algorithm, including the rationale behind design choices. Learning skills: Ability to independently deepen understanding of programming and algorithm analysis concepts, developing effective strategies to tackle computational problems.
Assessment MODULE 1	Assessment of a project work (project report + pitch) and individual short essays The students will work on a real-life challenge offered by an organization. The starting point for the project work will be one of these: Business (e.i. potential of a brand, business model, a new category of products...); Technology (e.i. technological unlock product driven, capability driven...); People (e.i. sustainability, aging, health and wellness...). • No exam for non-attending students.
Assessment MODULE 2	1. Practical assessment on Python programming 2. Written and practical assessment on computational complexity 3. Written and practical assessment on algorithms As optional replacement for points 1 and 2, two midterm tests.
Assessment language	English

Evaluation criteria and criteria for awarding marks	**MODULE 1** The evaluation is made of a collective grade (resulting from the group project work) and an individual evaluation that will make up the student's final grade. The evaluation criteria are as follows: • Project report (60% of project evaluation) • Final project pitch (40% of project evaluation) • 3 individual short essays (+/- 2 points on individual evaluation) at the beginning, middle, and after the end of the course • Individual participation to in-class discussions and project reviews (+/- 1 points on individual evaluation) **MODULE 2** Grade is the weighted average of the exam's parts (or the corresponding midterms), based on the number of lessons' hours.

Required readings	**MODULE 1** Main suggested bibliography for the project-based course (more references will be provided during the course) • Brown, T. (2009). *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation*. Harper Collins. • Martin, R. L. (2009). *The design of business*: *Why design thinking is the next competitive advantage*. Harvard Business Press. • Verganti, R. (2009). *Design driven innovation: changing the rules of competition by radically innovating what things mean*. Harvard Business Press. • Osterwalder, A., Pigneur, Y., Bernarda, G., & Smith, A. (2015). *Value proposition design: How to create products and services customers want*. John Wiley & Sons. • Bland, D. J., & Osterwalder, A. (2019). *Testing business ideas: A field guide for rapid experimentation*. John Wiley & Sons. • Knapp, J., Zeratsky, J., & Kowitz, B. (2016). *Sprint: How to solve big problems and test new ideas in just five days*. Simon and Schuster. **MODULE 2** The learning material is fully provided during the lessons. For those interested in further reading or deepening their understanding, the following books are optional suggestions:

	• Horstmann C.S., Necaise R.D. (2019). *Python for Everyone.* John Wiley & Sons • Wirth, N. (1986). "Algorithms and data structures". Prentice-Hall.
Supplementary readings	