

Master of Science in Media Engineering and Technology

Profile of the Study Program

The **GIU Faculty of Engineering** seeks to establish world-leading engineering knowledge by providing first-class teaching and pursuing cutting edge innovative research. Our knowledge targets the benefit of society and is transferred to the industry through our graduates, who are capable of taking leadership positions in a variety of fields in industry and academia. Research and teaching are in alignment with the Media Engineering and Technology Faculty of the German University in Cairo, enabling extended as well as student exchange.

The study program **Master of Science in Media Engineering and Technology** contributes to the university's mission by providing a unique study program that carefully blends research-oriented learning with market-oriented training. This is done through a set of diversified teaching methods and a curriculum that addresses state-of-the-art topics and techniques. The offered courses ensure that graduates have advanced knowledge in different areas of computer science and/or digital media engineering. The overall study program objectives are:

- Deepen the fundamental scientific and engineering principles in the field of Computer Science and Engineering and Digital Media Engineering and Technology
- Amplify the scientific capabilities by analyzing and solving problems, and conducting research work
- Build and refine personal skills in critical thinking, problem analysis and problem solving
- Strengthen the ability to work in teams and communicate effectively, both verbally and in writing, in a multi-cultural environment to achieve objectives
- Motivate and enable further studies (PhD), nationally and internationally

Within the program students must choose between two majors:

- *Computer Science and Engineering (CSEN)* is designed to give students more experience with various problems in advanced computer and computational engineering, by being able to apply scientific methods, and being able to adapt to new scientific findings. Graduates will have command of state-of-the-art computer engineering techniques, skills and tools, and knowledge of contemporary issues and modern trends in computer engineering. They will be able to design, as

well as to analyze and assess computer components and systems. In addition, the students will learn to estimate the impacts of computer engineering solutions in multidisciplinary problems which require computational methods.

- *Digital Media Engineering and Technology (DMET)* is designed to produce graduate engineers with the skills to develop digital technologies for audio-visual content production and delivery. Increasingly sophisticated technologies, including virtual reality, interactive media and computer vision will enable us all to experience more ideas, more compellingly and more easily. Demand for expertise in these areas is growing at an amazing rate. The DMET courses provide students with both sets of skills to meet these new demands – to be fully accredited engineers with an understanding not only of advanced media hardware and software systems but also with the knowledge and appreciation of how these systems can be used in dynamic and creative ways.

The **qualification goals** of the postgraduate study program in Media Engineering and Technology are:

1. Demonstrate research skills utilizing logic and mathematics, including calculus and discrete mathematics
2. Demonstrate advanced skills in software design and development, algorithms, operating systems, programming languages, theory of computation, computer architecture, or other key areas in computer science or digital media engineering
3. Successfully apply these principles and practices to a variety of problems
4. Work with others on multi-disciplinary teams in both classroom and laboratory environments
5. Demonstrate the ability to communicate effectively both orally and in writing
6. Ability to carry out a scientific task independently using scientific methods
7. Communicate a specific research task and analyze and discuss the results obtained, including conclusions,
8. Realize the need to continuously refine their computing knowledge and skills and learn to use new tools and processes
9. Demonstrate competitive professional advancement with the option to pursue higher graduate degrees and engage in advanced research in areas of their interest within the industry, research centers, and academia both in the local and global environment

The **teaching methods** include a balanced mix between research-oriented projects and practical tasks. After finalizing the courses, the students write their thesis under the supervision of a PhD holder. Interdisciplinary research and collaboration with partner universities are strongly encouraged. The highest quality standards are enforced to ensure the research produced has a clear scientific value. All teaching and research activities in this program are conducted using the English language.

Curriculum

L = Lecture, E = Exercise (Tutorials), P = Practical (all in contact hours)

Semester 1

Core courses taken by all majors

Code	Course	L	T	P	ECTS
DMET M101	Experimental Design	2	2	0	5
DMET M102	Computer Vision	2	2	0	5

Courses per major:

- CSEN

xxx	Elective I	2	2	0	5
xxx	Elective II	2	2	0	5
CSEN M103	Artificial Intelligence	2	2	0	5
CSEN M104	Advanced Computer Lab I	0	0	4	5

- DMET

xxx	Elective I	2	2	0	5
xxx	Elective II	2	2	0	5
DMET M105	Advanced Video Processing	2	2	0	5
DMET M106	Advanced Media Lab I	0	0	4	5

Total		10	10	4	30
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Semester 2

Core courses taken by all majors

Code	Course	L	T	P	ECTS
HUMA M201	Project Management	2	2	0	3
CSEN/DMET M202	Seminar	2	0	0	2

Courses per major

- CSEN

DMET/CSEN/ MCTR	Elective I	2	2	0	5
DMET/ CSEN /MCTR	Elective II	2	2	0	5
CSEN M203	Computer and Network Security	2	2	0	5
CSEN M204	Advanced Computer Lab II	0	0	4	5
CSEN M205	Compiler	2	2	0	5

- DMET

DMET/ CSEN /MCTR	Elective I	2	2	0	5
DMET/ CSEN /MCTR	Elective II	2	2	0	5
DMET M206	Image Processing	2	2	0	5
DMET M207	Advanced Media Lab II	0	0	4	5
DMET M208	Audio and Acoustics	2	2	0	5

Total		12	10	4	30
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Electives are to be selected from updated list per semester.

Semester 3

Code	Course	Duration	ECTS
CSEN/DMET M301	Master Thesis and Seminar	6 months	30