Bachelor 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 **Bachelor 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 overall study program objectives are:

- Produce graduates that can pursue top international leadership positions.
- Provide graduates with strong foundations in basic sciences, computer sciences and engineering, and digital media engineering, so that they are able to creatively apply their understanding to the real-world problems they will face in whatever career path they choose.
- Tackle challenging and fundamental real-world problems with the potential of long-term social benefit.
- Enable graduates to pursue postgraduate studies at international leading academic institutions.

Within the program students can 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 undergraduate study program in Media Engineering and Technology are:

1. Possess deep understanding of fundamental basic sciences such as mathematics, physics, and computer science
2. Possess advanced practical skills in programming and software development
3. Possess practical and theoretical knowledge in specialized fields of CSEN and DMET such as databases, algorithms, operating systems, embedded systems, computer graphics, computer networks, and security
4. Demonstrate advanced analytical and problem-solving skills
5. Demonstrate the ability to work under pressure in a demanding environment
6. Pursue graduate studies in different fields of computer science and digital media engineering in any national or international academic institution of their choice
7. Understand and respect the professional standards of ethics
8. Demonstrate good oral and written communication abilities, teamwork, and multi-cultural adaptation
9. Demonstrate ability to apply research methods to given problems

The **teaching methods** ensure strong foundations in theoretical concepts as well as advanced practical skills. Constant interaction, discussions, teamwork, and guidance in small groups (max. 25 students) are always used. Research-oriented projects and practical tasks allow the students to explore advanced concepts and fields prior to graduation. The teaching language is English throughout the entire curriculum.

In industry, our bachelor program enables the **graduates** to pursue opportunities nationally or internationally. Our program provides theoretical knowledge and research skills, at the same time it is practice-oriented and thus our graduates are considered market-ready. The graduates acquire these technical skills through courses that deepen their knowledge of the required theoretical material, and applied projects that develop their practical skills. Thus, our graduates will possess the knowledge to work with state-of-the-art tools and technologies and develop

advanced computer-based systems. The students will also have the required skills to self-learn and work independently or as part of a team.

In academia, our bachelor program graduates are qualified to pursue master's degrees in almost any university nationally or internationally. Our program helps the students to develop the necessary research and problem-solving skills for pursuing a graduate degree. In addition, our studies are built on a strong foundation in basic sciences such as mathematics, physics, and chemistry. Moreover, our students learn how to apply scientific methodology and how to design experiments to evaluate different projects.

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Curriculum

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

1st Semester

Code	No.	Course Name	L	E	P	ECTS
CSEN	B102	Introduction to Computer Programming	4	4	4	12
EDPT	B101	Engineering Drawing and Design	1	2	0	3
MATH	B103	Mathematics I (Analysis and Linear Algebra)	4	4	0	8
PHYS	B102	Physics I	2	2	0	5
HUMA	B102	Critical Thinking and Scientific Methodology	0	2	0	2
Total			11	14	4	**30**

2nd Semester

Code	No.	Course Name	L	E	P	ECTS
PHYS	B201	Physics II	2	2	2	5
ELCT	B201	Electric Circuits I	2	2	2	5
CSEN	B201	Data Structures and Algorithms	2	2	2	6
ELCT	B202	Digital Logic Design	2	2	0	5
MATH	B201	Mathematics II (Multivariate Analysis & Differential Equations)	4	4	0	7
HUMA	B202	Communication and Presentation Skills	0	2	0	2
Total			12	14	6	**30**

3rd Semester

Code	No.	Course Name	L	E	P	ECTS
MATH	B301	Mathematics III Probability and Statistics	2	2	0	4
COMM	B301	Signal and System Theory	2	2	2	5
CSEN	B301	Computer Programming Lab	2	0	2	5

Code	No.	Course Name	L	E	P	ECTS
CSEN	B302	Computer Organization & System Programming	2	2	0	4
CSEN	B303	Concepts of Programming Languages	2	2	0	5
ELCT	B301	Electric Circuits II	2	2	2	5
HUMA	B302	Research Paper Writing	0	2	0	2
Total			12	12	6	**30**

4th Semester

Code	No.	Course Name	L	E	P	ECTS
MATH	B401	Mathematics IV Discrete Mathematics	2	2	0	4
DMET	B401	Introduction to Media Engineering	2	2	0	5
CSEN	B401	Databases I	2	2	2	6
CSEN	B403	Introduction to Communication Networks	2	2	0	5
CSEN	B405	Digital System Design	2	2	0	4
CSEN	B402	**CSEN** Theory of Computation	4	2	0	6
DMET	B402	**DMET** Computer Graphics	2	2	2	6
Total			14/12	12	2/4	**30**

5th Semester

Code	No.	Course Name	L	E	P	ECTS
CSEN	B501	Computer System Architecture	2	2	2	6
CSEN	B502	Operating Systems	2	2	0	5
MNGT	B501	Introduction to Management	2	0	0	2
CSEN	B503	**CSEN** Software Engineering	2	0	2	6
CSEN	B504	Databases II	2	0	2	5
DMET	B502	Network and Media Lab	2	0	2	6
DMET	B501	**DMET** Web Technologies and Usability	2	0	2	6
DMET	B503	Digital Signal Processing	2	2	0	5
DMET	B502	Network and Media Lab	2	0	2	6
Total			12	4/6	8/6	**30**

6th Semester

Code	No.	Courses	L	E	P	ECTS
CSEN	B601	Embedded System Architecture	3	2	0	5
DMET	B402	**CSEN** Computer Graphics	2	2	2	6
CSEN	B603	Analysis and Design of Algorithms	2	2	0	5
CSEN	B602	Microprocessors	3	2	0	6
CSEN	B604	Advanced Computer Lab	0	0	4	8
DMET	B602	**DMET** Visualization and Animation	3	2	2	7
DMET	B603	Video and Audio Technology	2	2	0	5
DMET	B604	Multimedia and Networking	2	2	0	5
DMET	B606	Advanced Media Lab	0	0	4	8
Total			10	8	6	**30**

7th Semester

Code	No.	Course Name	Duration	ECTS
CSEN/DMET	B701	Internship/Training	3 Months	15
CSEN/DMET	B702	Bachelor Thesis & Seminar	3 Months	15
Total			6 Months	**30**