



COMMUNICATIONS & COMPUTERS ENGINEERING

PROGRAM MATRIX

<http://engfac.mans.edu.eg/>

PROGRAM VISION

“ Achieve leadership in the field of communications and computer engineering and gain the confidence of the local and regional community in the graduate of the program ”

PROGRAM MISSION

“ The Communications and Computers Engineering program at Mansoura University committed to prepare scientifically and technically qualified and professional engineers in the fields of communications and computer engineering, able to compete in the local and regional labor market and conduct scientific research to serve society and develop the environment “

PROGRAM AIMS

Upon successful completion of the program, graduates must be able to:

1. Acquire knowledge of mathematics, elementary science, necessary to solve engineering fundamental problems, design systems, conduct experiments, and analyze data within realistic constraints and considering the impacts on society and environment.
2. Identify practical, soft, presentation, management and language skills to ensure effective communication, display professional, manage projects and ethical responsibilities, engage in self and life-long learning, and demonstrate knowledge of contemporary engineering issues.
3. Acquire knowledge and practical skills of communication and computer engineering requirements to solve their associated problems, design and conduct experiments within heterogeneous teams under realistic constraints.
4. Identify different kinds of communication, network, security, control, and electronics, embedded systems with an understanding the design, operation, maintenance and associated limitations in industrial applications.
5. Use current advanced techniques, skills, necessary to design, implement computer-based systems in diverse fields with appropriate attention to hardware installation, software design, data manipulation and system operations.
6. Incorporate economics and business practices on both operational and decision-making levels including projects and risks using system analysis tools and techniques.

Intended Learning Outcomes (ILO's)

Knowledge and Understanding

The graduates of the Communications and Computers engineering program should be able to:

1. Memorize concepts and theories of mathematics and elementary sciences related to the communication and information engineering.
2. Recognize the basics of information and communication technology (ICT).
3. Identify the characteristics of engineering materials related to the communication and computer engineering.
4. Underline the principles of design for elements, processes and systems related to communication and computer engineering.
5. Define the methodologies of solving engineering problems, data collection and interpretation.
6. Describe the quality assurance systems, codes of practice and standards
7. Recognize the health and safety requirements and environmental issues.
8. Recognize business and management principles relevant to engineering.
9. Identify current engineering technologies as related to communication and Computer engineering.
10. Be aware of topics related to humanitarian interests and moral issues.
11. Be aware of Technical language and report writing
12. Identify Professional ethics and impacts of engineering solutions on society and environment.
13. Identify Contemporary engineering topics.
14. List principles of analyzing and design of electronic circuits and control systems.
15. Recognize Biomedical instrumentation.



A Knowledge and Understanding (Continued)

16. Acquire the basics of communication systems.
17. Describe the characteristics of coding and decoding techniques related to ICT.
18. Acquire an understanding of microwave applications.
19. Acquire an understanding of antennas and wave propagation.
20. State Nanotechnology applications.
21. Identify related research and current advances in the field of computer software and hardware.
22. Recognize the use of optical fiber.
23. Recall engineering principles in the fields of data manipulation, logic design, circuit analysis, machine and assembly languages, computer organization and architectures, memory hierarchy, embedded systems, signal processing, operating and distributed systems, real-time systems and reliability analysis.

B Intellectual Skills

The graduates of the Communications and Computers engineering program should be able to:

1. Select appropriate mathematical and computer-based methods for modeling and analyzing problems.
2. Select appropriate solutions for engineering problems based on analytical thinking.
3. Think in a creative and innovative way in problem solving and design.
4. Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.
5. Assess and evaluate the characteristics and performance of components, systems and processes.
6. Investigate the failure of components, systems, and processes.
7. Solve engineering problems, often on the basis of limited and possibly contradicting information.
8. Select and appraise appropriate ICT tools to a variety of engineering problems.
9. Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.
10. Incorporate economic, societal, environmental dimensions and risk management in design.
11. Analyze results of numerical models and assess their limitations.
12. Create systematic and methodic approaches when dealing with new and advancing technology.
13. Formulate mathematical tools, computing methods, design techniques for modeling and analyzing communication and computer-based systems.
14. Integrate computer objects running on different system configurations.
15. Synthesize, and apply suitable IT tools to computer engineering problems.
16. Create various computer-based solutions to business system problems including direct and indirect costs and cost-benefit analysis.
17. Identify symptoms in problematic situations.
18. Innovate solutions based on non-traditional thinking and the use of the latest information and communication technologies.

C Practical and Professional Skills

On successful completion of the program, the graduates of the Communications and Computers engineering program should be able to:

1. Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.
2. Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services.
3. Create and/or re-design a process, component or system, and carry out specialized engineering designs.
4. Practice the neatness and aesthetics in design and approach.
5. Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.
6. Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.
7. Apply numerical modeling methods to engineering problems.
8. Apply safe systems at work and observe the appropriate steps to manage risks.
9. Demonstrate basic organizational and project management skills.
10. Apply quality assurance procedures and follow codes and standards.
11. Exchange knowledge and skills with engineering community and industry.
12. Prepare and present technical reports.
13. Design and operate computer-based, electronic and communication systems.
14. Use appropriate specialized communication and information engineering tools throughout the phases of the life cycle of system development;
15. Write computer programs on professional levels achieving acceptable quality measures in software development
16. Conduct user support activities appropriate to the discipline.

D General and Transferrable Skills

The graduates of the Communications and Computers engineering program should be able to:

1. Collaborate effectively within multidisciplinary team.
2. Work in stressful environment and within constraints.
3. Communicate effectively.
4. Demonstrate efficient IT capabilities.
5. Lead and motivate individuals.
6. Effectively manage tasks, time, and resources.
7. Search for information and engage in life-long self-learning discipline.
8. Acquire entrepreneurial skills.
9. Refer to relevant literatures.