



مركز ضمان الجودة والتأهيل للاعتماد

Quality Assurance
& Qualification for Accreditation Center



جامعة ٦ أكتوبر
October 6 University


السيد الأستاذ الدكتور / محمد محمود
عميد كلية الهندسة

تحية طيبة وبعد ،،،

مرسل لسيادتكم صورة (طبق الأصل) من النسخة المُعتمدة من المعايير الأكاديمية المرجعية
لبرنامج هندسة الإلكترونيات والاتصالات الكهربائية ، بالإضافة إلى صورة (طبق الأصل) من
خطاب اعتماد المعايير الصادر من الهيئة القومية لضمان جودة التعليم والاعتماد .

وتفضلوا بقبول وافر الشكر ،،،

مدير مركز ضمان الجودة


ع.١٥/١٠/٥
أ.م.د/ داليا طه

تحريراً في ٢٠١٥/١٠/٥

السيد الأستاذ الدكتور / عميد كلية الهندسة

جامعة ٦ أكتوبر

تحية طيبة وبعد ، ، ،

فى إطار التعاون المثمر والبناء بين الهيئة القومية لضمان جودة التعليم والاعتماد وكليتكم الموقرة ، وفى ضوء خطابكم بشأن طلب اعتماد المعايير الأكاديمية المرجعية لبرنامج هندسة الإلكترونيات والاتصالات الكهربائية.

يرجى التفضل بالإحاطة بأنه قد تم مراجعة وتحكيم المعايير الأكاديمية المرجعية المقدمة من كليتكم ، وقد تم اعتمادها من مجلس إدارة الهيئة بالجلسة رقم (١٤٥) بتاريخ ٢٠ سبتمبر ٢٠١٥ م، ومرسل لسيادتكم نسخة ورقية معتمدة من هذه المعايير.

وتفضلوا بقبول فائق الاحترام والتقدير ، ، ،

رئيس مجلس إدارة الهيئة


أ.د/ يوهانسن عيد

أ.د / أحمد عطية سعده
رئيس الجامعة
صوره ملين الراسل

Academic Reference Standards (ARS)
for
Electronics and Electrical Communications
Engineering
B. Sc. Program

Faculty of Engineering,
October 6 University

September 2015
1st Edition



هشام محمد السيد
أ.د / أحمد عطية سعده
رئيس الجامعة

Contents

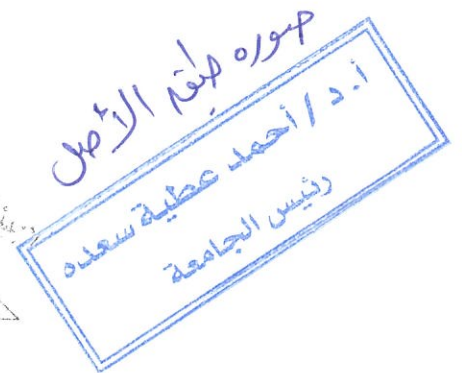
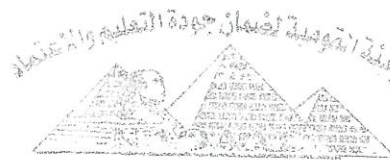
Introduction.....	3
National Academic Reference Standards (NARS) for Engineering ..	4
Curriculum Structure	10
Academic Reference Standards (ARS) for Electronics and Electrical Communications Engineering	11
Glossary	15



Introduction

The field of Electronics and Electrical Communications Engineering mainly deals with the communication technologies along with the basic electronic components, design of circuits and systems. It plays an important role in almost every sphere of our life. Radio, television, telephones, computers, automobiles, office machinery and house-hold appliances, life saving medical equipment and space vehicles represent a mere sample in the wide spectrum of application of Electronics. In the age of satellite transmitted television and transcontinental computer network, the challenge and opportunities in this profession continue to expand. Electronics and Communication Engineering graduates have unlimited opportunities in the field of mobile communication, microwave communication, robotics, defense, radio communication, TV broadcasting, telegraphy & telephony, VLSI design, DSP, wireless communication and biotechnology.

Electronics and Electrical Communications engineer should have strong background in basic science and basic mathematics and be able to see these tools in their own engineering field. He should employ necessary techniques, hardware, and communication tools for modern engineering applications. He also should be able to work in a multi-disciplinary environment, and follow and contribute to the developments in their own field recognizing the significance of lifelong learning.



Electronics and Electrical Communications engineering is a broad discipline that covers the fields of integrated electronic circuits, communications, signal processing, microwave, wave propagation and antennas, automatic control and monitoring systems, network analysis, digital signal processing, microprocessors, communication systems, mobile communications, biomedical, and image processing. Programs of communications engineering are designed to include concentration courses covering these areas while keeping a balance between theoretical and laboratory experience. Courses of interest include electric machinery, power systems, control theory, industrial electronics, digital control techniques, robotics, mechatronics, biomedical systems,...etc. The capstone senior thesis and industrial internship are also required. State-of-the-art elective courses provide seniors and advanced undergraduates.

National Academic Reference Standards (NARS) for Engineering

Attributes of the Graduates

The graduates of the engineering programs should be able to:

1. Apply knowledge of mathematics, science and engineering concepts to the solution of engineering problems.
2. Design a system; component and process to meet the required needs within realistic constraints.

صورة طبق الأصل
أ.د / أحمد عطية سعد
رئيس الجامعة

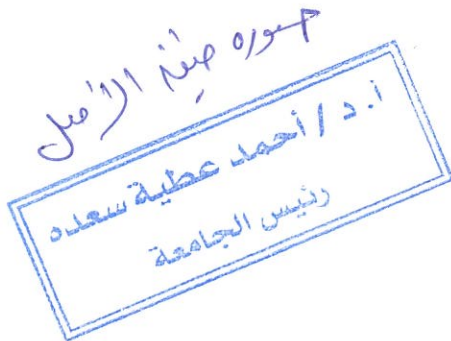


3. Design and conduct experiments as well as analyze and interpret data.
4. Identify, formulate and solve fundamental engineering problems.
5. Use the techniques, skills, and appropriate engineering tools, necessary for engineering practice and project management.
6. Work effectively within multi-disciplinary teams.
7. Communicate effectively.
8. Consider the impacts of engineering solutions on society and environment.
9. Demonstrate knowledge of contemporary engineering issues.
10. Display professional and ethical responsibilities; and contextual understanding.
11. Engage in self- and life- long learning.

1. Knowledge and Understanding

The graduates of the engineering programs should be able to demonstrate the knowledge and understanding of:

- 1.1. Concepts and theories of mathematics and sciences, appropriate to the discipline.
- 1.2. Basics of information and communication technology (ICT).
- 1.3. Characteristics of engineering materials related to the discipline.



- 1.4. Principles of design including elements design, process and/or a system related to specific disciplines.
- 1.5. Methodologies of solving engineering problems, data collection and interpretation.
- 1.6. Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.
- 1.7. Business and management principles relevant to engineering.
- 1.8. Current engineering technologies as related to disciplines.
- 1.9. Topics related to humanitarian interests and moral issues.
- 1.10. Technical language and report writing.
- 1.11. Professional ethics and impacts of engineering solutions on society and environment.
- 1.12. Contemporary engineering topics.

2. Intellectual Skills

The graduates of the engineering programs should be able to:

- 2.1. Select appropriate mathematical and computer-based methods for modeling and analyzing problems.
- 2.2. Select appropriate solutions for engineering problems based on analytical thinking.
- 2.3. Think in a creative and innovative way in problem solving and design.

هشور هظنم الرضل
ا.د / أحمد عطية سعده
رئيس الجامعة

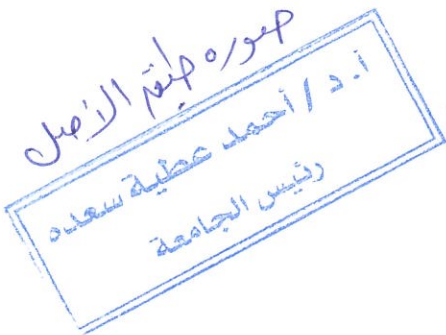


- 2.4. Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.
- 2.5. Assess and evaluate the characteristics and performance of components, systems and processes.
- 2.6. Investigate the failure of components, systems, and processes.
- 2.7. Solve engineering problems, often on the basis of limited and possibly contradicting information.
- 2.8. Select and appraise appropriate ICT tools to a variety of engineering problems.
- 2.9. Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.
- 2.10. Incorporate economic, societal, environmental dimensions and risk management in design.
- 2.11. Analyze results of numerical models and assess their limitations.
- 2.12. Create systematic and methodic approaches when dealing with new and advancing technology.

3. Practical and Professional Skills

The graduates of the engineering programs should be able to:

- 3.1. Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.



- 3.2. Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services.
- 3.3. Create and/or re-design a process, component or system, and carry out specialized engineering designs.
- 3.4. Practice the neatness and aesthetics in design and approach.
- 3.5. Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.
- 3.6. Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.
- 3.7. Apply numerical modeling methods to engineering problems.
- 3.8. Apply safe systems at work and observe the appropriate steps to manage risks.
- 3.9. Demonstrate basic organizational and project management skills.
- 3.10. Apply quality assurance procedures and follow codes and standards.
- 3.11. Exchange knowledge and skills with engineering community and industry.
- 3.12. Prepare and present technical reports.

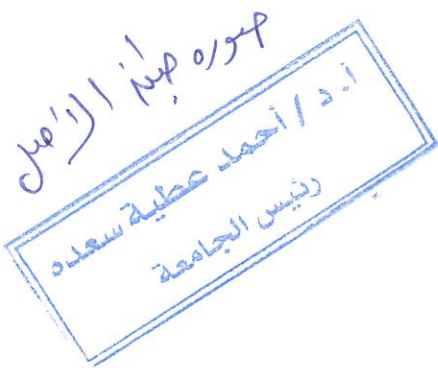
سورة هيثم الزهر
أ.د / أحمد عطية سعد
رئيس الجامعة



4. General and Transferable Skills

The graduates of the engineering programs should be able to:

- 4.1. Collaborate effectively within multidisciplinary team.
- 4.2. Work in stressful environment and within constraints.
- 4.3. Communicate effectively.
- 4.4. Demonstrate efficient IT capabilities.
- 4.5. Lead and motivate individuals.
- 4.6. Effectively manage tasks, time, and resources.
- 4.7. Search for information and engage in life-long self learning discipline.
- 4.8. Acquire entrepreneurial skills.
- 4.9. Refer to relevant literatures.



Curriculum Structure

Subject Areas	Percentage	Tolerance
Humanities and Social Sciences	11 %	9 - 12 %
Mathematics and Basic Sciences	21 %	20 - 26 %
Basic Engineering Sciences	21 %	20 - 23 %
Applied Engineering and Design	21 %	20 - 22 %
Computer Applications and ICT*	10 %	9 - 11 %
Projects* and Practice	9 %	8 - 10 %
Subtotal	93 %	92 - 94 %
Discretionary (Institution character-identifying) subjects	7 %	6 - 8 %
Total	100 %	100 %

* This part of the curriculum may be served in separate course(s) and/or included in several courses and its hours should be indicated in the course specification.

أ.د. / أحمد عطية سعود
رئيس الجامعة

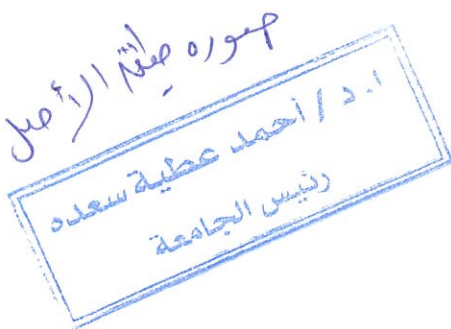


Academic Reference Standards (ARS) for Electronics and Electrical Communications Engineering

The Attributes of Electronics and Electrical Communications Engineering Graduates

In addition to the attributes of Engineering graduates, the Electronics and Electrical Communications Engineering graduates must be able to:

1. Participate in and lead quality improvement projects in the field of electronics and communications.
2. Manipulate with the electronic circuits and systems, all the way from the discrete components level, circuits analysis and design to the troubleshooting with emphasis on electronic power devices.
3. Apply control theory and measurement principals for industrial variables, signal conversion, conditioning and processing.
4. Deal with the computer's hardware, software, operating systems and interfacing.
5. Manipulate with the optoelectronics and optical fibers, antennas, radio wave propagation and microwave communication.
6. Design, operate and maintain digital and analog communication, mobile communication, coding, and decoding systems.



1. Knowledge and Understanding

In addition to the knowledge and understanding acquired by Engineering graduates, the Electronics and Electrical Communications Engineering graduates must demonstrate knowledge and understanding of:

- 1.1. Elementary science underlying electrical and electronic engineering systems and information technology.
- 1.2. Basics of design and analysis of electronic circuits and systems, while considering the constraints of applying inappropriate technology and the needs of commercial risk evaluation.
- 1.3. Principles of analysis and design of control systems with performance evaluation.
- 1.4. Computer Architecture and Interfacing.
- 1.5. Analog and Digital Communication systems.
- 1.6. Digital Signal Processing.
- 1.7. Biomedical instrumentation.
- 1.8. Integrated and nano-electronics.
- 1.9. Microwaves, Antennas, and radio wave propagation.
- 1.10. Optoelectronics and optical communications.
- 1.11. TV Technology.

أحمد عطية سعد
رئيس الجامعة
أ.د / أحمد عطية سعد
جامعة القاهرة



2. Intellectual Skills

In addition to the intellectual skills acquired by Engineering graduates, the Electronics and Electrical Communications Engineering graduates should be able to:

- 2.1. Select the appropriate mathematical tools and computing methods for modeling and analyzing electronics and communication systems
- 2.2. Develop innovative solutions for the practical industrial electronics and communications engineering problems based on non-traditional thinking and use of latest technologies.
- 2.3. Plan, conduct and write a report on a project or assignment.
- 2.4. Analyze the performance of digital and analog communication systems.
- 2.5. Synthesize and integrate electronic systems for certain specific function using the right equipment.
- 2.6. Select, synthesize and apply suitable IT tools to communication and electronics engineering problems.

3. Practical and Professional Skills

In addition to the practical and professional skills acquired by Engineering graduates, the Electronics and Electrical Communications Engineering graduates should be able to:

- 3.1. Use appropriate mathematical methods or IT tools.



- 3.2. Practice computer programming for the design and diagnostics of digital and analog communication systems.
- 3.3. Use relevant laboratory equipment and analyze the results correctly.
- 3.4. Troubleshoot, maintain and repair different types of electronic systems using the standard tools.
- 3.5. Identify appropriate specifications for required devices.
- 3.6. Use appropriate tools to measure electronic system performances.
- 3.7. Use appropriate devices to measure different parameters of communication systems.
- 3.8. Use laboratory equipment to design and implement high frequency measurements.
- 3.9. Troubleshoot, maintain, and repair different types of communication systems.

4. General and Transferable Skills

The graduates must be able to demonstrate the general and transferable skills of engineering graduates.

م. د. / أحمد عطية سعد
رئيس الجامعة

