Republic of Iraq
Ministry of Higher Education & Scientific Research
Supervision and Scientific Evaluation Directorate
Quality Assurance and Academic Accreditation
International Accreditation Dept.
Al-Ayen University

Academic Program Specification Form for The Academic 2024-2025

University: AL-Ayen Iraqi University
College: College of Engineering
Number of Departments in The College: Biomedical Engineering Department
Date of Form Completion: 25/9/2024

Dean's Name	Dean's Assistant For Scientific Affairs	The College Quality Assurance And University Performance Manager
Date : / /	Date : / /	Date : / /
Signature	Signature	Signature

Quality Assurance and University Performance Manager
Date: / /
Signature

TEMPLATE FOR COURSE SPECIFICATION

Electronics

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification.

1. Teaching Institution	Al-Ayen Iraqi University
2. University Department/Centre	Biomedical Engineering
3. Course title/code	MDER210
4. Modes of Attendance offered	Weekly, 4 hours theory + (3hours Lab + 1-hour Tutorial)
5. Semester/Year	First semester, 2024-2025
6. Number of hours tuition (total)	124 hours
7. Date of production/revision of this specification.	25/9/2024

8. Aims of the Course:

- Understanding basic electronic components.
- Design and analysis of electronic circuits.
- Ability to use engineering tools (Multisim, PSpice).

- Understanding frequency response of circuits and signal modulation.
- Applying electronics in practical applications and linking theory with practic
- Developing research and analytical thinking skills.

9. Learning Outcomes, Teaching, Learning and Assessment Method:

A. Cognitive goals

- Introduce students to basic electronic components.
- Enable students to design electronic circuits.
- Familiarize with physical principles.
- Understand the importance of biasing techniques and frequency response.
- Differentiate between different types of transistors and their applications.
- Analyze electronic circuits using simulation software.

B. The skills goals special to the course.

- Develop measurement and evaluation skills.
- Build and analyze integrated circuits.
- Develop laboratory skills.
- Use engineering tools and simulation programs.

Teaching and Learning Methods

A- Theoretical lectures.

B- Conducting laboratory experiments.

C- Learning through software and simulations.

D- Presentations and discussions.

E- Practical lessons and workshops.

F- Self-reading and scientific research.

Assessment methods

A- Midterm and final exams.

B- Practical evaluation in the lab.

C- Assignments, homework, and projects.

D- Presentations.

E- Reports and research.

F- Quizzes

Affective and value goals

• Fostering the spirit of innovation and creativity.

• Developing a sense of responsibility.

• Encouraging teamwork and collaboration.

• Promoting ethical and professional values.

• Inspiring initiative in ideas and leadership

General and rehabilitative transferred skills (other skills relevant employability and personal development)

• Technical knowledge of electronic concepts, which enhances employability i various engineering fields.

• Developing the ability to adapt to changes in work environments and technology.

• Leadership skills.

• Communication skills and the ability to express ideas clearly and effectively

• Time management and scheduling skills.

10. Course Structure					
Assessment Method	Teaching Method	Unit/Module or Topic Title	ILOs	Hours	Week
Homework, daily quizzes, monthly exams, and final exams.	Theoretical Lecture	Semiconductor Diodes: PN Junction, Forward & Reverse Biased	Student's grasp of the lecture content.	4	1st
Homework, daily quizzes, monthly exams, and final exams	Theoretical Lecture	Diode Equivalent Circuits, Dc characteristics.	Student's grasp of the lecture content.	4	2nd
Homework, daily quizzes, monthly exams, and final exams	Theoretical Lecture	Diode Applications: Rectifiers	Student's grasp of the lecture content.	4	3rd
Homework, daily quizzes, monthly exams, and final exams	Theoretical Lecture	Clipping & Clamping Circuits	Student's grasp of the lecture content.	4	4th
Homework, daily quizzes, monthly exams, and final exams	Theoretical Lecture	Zener Diodes	Student's grasp of the lecture content.	4	5th
Homework, daily quizzes, monthly exams, and final exams	Theoretical Lecture	Bipolar Junction Transistor (BJT): Operation of pnp and npn transistor	Student's grasp of the lecture content.	4	6th

Homework, daily quizzes, monthly exams, and final exams	Theoretical Lecture	Characteristics of CE, CB & CC Configurations Operating Point and Operating Regions	Student's grasp of the lecture content.	4	7th
Homework, daily quizzes, monthly exams, and final exams	Theoretical Lecture	Biasing the BJT:	Student's grasp of the lecture content.	4	8th
Homework, daily quizzes, monthly exams, and final exams	Theoretical Lecture	Equivalent circuit model, Dc analysis of transistor	Student's grasp of the lecture content.	4	9th
Homework, daily quizzes, monthly exams, and final exams	Theoretical Lecture	Design of dc bias circuits, design of current gain stabilized	Student's grasp of the lecture content.	4	10th
Homework, daily quizzes, monthly exams, and final exams	Theoretical Lecture	Small Signal Low Frequency Analysis: Transistor amplifier,	Student's grasp of the lecture content.	4	11th
Homework, daily quizzes, monthly exams, and final exams	Theoretical Lecture	Comparison of BJT Amplifier Configurations	Student's grasp of the lecture content.	4	12th
Homework, daily quizzes, monthly exams, and final exams	Theoretical Lecture	Cascading Amplifiers, Simplified Models,	Student's grasp of the lecture content.	4	13th

Homework, daily quizzes, monthly exams, and final exams	Theoretical Lecture	Frequency response of RC coupled amplifier & high performance of RC coupled amplifier.	Student's grasp of the lecture content.	4	14th

11. Infrastructure	
1. Electronic Devices and Circuit Theory. Robert L. Boylestad, Louis Nashelsky. 2. Electronic Circuits Handbook for Design and Application. F.A. Blosted.	1- Books Required reading
1. Boylestad, R., & Nashelsky, L. (2014). Electronic devices and circuit theory. Prentice Hall. 2. Malvino, A. P., & Bates, D. (2015). Electronic principles (7th ed.). McGraw-Hill Education. 3. Blosted, F. A. (2020). Electronic circuits: Handbook for design and application. Wiley.	2- Main references (sources)
BOOKS " The Art of Electronics" by Paul Horowitz and Winfield Hill " .Fundamentals of Electric Circuits" by Charles K. Alexander and Matthew N. O. Sadiku. JOURNALS 1. IEEE Journal of Solid-State Circuits. 2. Microelectronics Journal. 3. International Journal of Electronics. 4. Sensors and Actuators A: Physical.	A) Recommended books and references (scientific journals, reports…)

1. https://ieeexplore.ieee.org/ 2. https://www.sciencedirect.com/ 3. https://www.allaboutcircuits.com/ 4. https://www.electronicshub.org/ 5. https://www.mdpi.com/ 6. https://dl.acm.org/ 7. https://www.sparkfun.com/	B-Electronic references, Internet sites…

12. The development of the curriculum plan

A- Integrating new technologies (microelectronics, Internet of Things (IoT), embedded systems, and artificial intelligence) into electronic applications.
B- Vocational training and providing opportunities for students to gain practical training in companies to enhance their practical experience.
C- Collaboration with industry and healthcare: Establishing partnerships and organizing field visits to enhance applied understanding.
D- Enhancing teaching methods through project-based learning: Designing practical projects related to course topics to stimulate practical application.
E- Improving laboratory practical experiences: Developing equipment and increasing practical experiments.