**COURSE SPECIFICATION**

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| 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. |

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| Baghdad University | 1. Teaching Institution |
| College of Engineering/Department of Electrical Engineering | 2. University Department/Centre |
| Electronics I | 3. Course title/code |
| Electrical Engineering | 4. Program(s) to which it contributes |
| Internal | 5. Modes of Attendance offered |
| Second Year Class | 6. Semester/Year |
| 90 | 7. Number of hours tuition (total) |
| 2016 | 8. Date of production/revision of this specification |
| 9. Aims of the Course | |
| Build strong electrical engineers able to design microelectronic circuits. Solve delicate problems in CMOS and BJT transistors. In addition to BICMOS. Furthermore, Multistage transistors and power amplifiers class A, B, AB and class C stages for discrete and IC circuit design. | |
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| 10· Learning Outcomes, Teaching, Learning and Assessment Method |
| 1. Knowledge and Understanding   A1. Understanding academic texts and try to solve the problems in the end of each chapter.  A2. Learn how to reflect the theoretical functions and definitions to practical applications.  A3. Finding and understanding information about electronic problems and theories. |
| B. Subject-specific skills  B1. Solving some specific problems with different ideas related to the subject courses.  B2. Explore the web pages that concerned on Electronic circuits.  B3. Manipulating some powerful software like Multisim in order to solve some delicate problems in electronic circuits.  B4. Making an oral presentation and seminars. |
| Teaching and Learning Methods |
| Lecturing and Exercises and Homework. |
| Assessment methods |
| Exams |
| C. Thinking Skills  C1. Being able to form personal opinions about issues through attempting to solve different problems. |
| Teaching and Learning Methods |
| Lecturing & Class discussions |
| Assessment methods |
| Exams that involve problem-solving skills and critical thinking skills |

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| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1. Effective Electronic Circuits to understand and imagine the idea behind the problem want to be solved.  D2. Team work |

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| 11. Course Structure | | | | | |
| Assessment Method | Teaching  Method | Unit/Module or Topic Title | ILOs | Hours | Week |
| Exam | Lecturing, Discussions & Exercises | MOSFET, Device Structure and Physical  Operation |  | 3 | 1 |
| Exam | Lecturing, Discussions & Exercises | Current-Voltage Characteristics, MOSFET Circuits at DC |  | 3 | 2 |
| Exam | Lecturing, Discussions & Exercises | Applying the MOSFET in Amplifier Design, Small-Signal Operation and Models |  | 3 | 3 |
| Exam | Lecturing, Discussions & Exercises | Basic MOSFET Amplifier Configurations. |  | 3 | 4 |
| Exam | Lecturing, Discussions & Exercises | Biasing in MOS Amplifier Circuits |  | 3 | 5 |
| Exam | Lecturing, Discussions & Exercises | Discrete-Circuit MOS Amplifiers, The Body Effect and Other Topics |  | 3 | 6 |
|  |  | New Year Holiday |  |  | 7 |
|  |  | Exam (1) |  | 1 | 8 |
| Exam | Lecturing, Discussions & Exercises | BJT,  Device Structure and Physical Operation, |  | 2 | 8 |
| Exam | Lecturing, Discussions & Exercises | Current–Voltage Characteristics, BJT Circuits at DC |  | 3 | 9 |
| Exam | Lecturing, Discussions & Exercises | Applying the BJT in Amplifier, Design  Small-Signal Operation and  Models |  | 3 | 10 |
| Exam | Lecturing, Discussions & Exercises | Basic BJT Amplifier  Configurations |  | 3 | 11 |
| Exam | Lecturing, Discussions & Exercises | Biasing in BJT Amplifier  Circuits |  | 3 | 12 |
|  |  | Mid-Year Break |  |  | 13 |
|  |  | Exam (2) |  | 1 | 14 |
| Exam | Lecturing, Discussions & Exercises | Discrete-Circuit BJT Amplifiers, Transistor Breakdown and Temperature Effects |  | 2 | 14 |
| Exam | Lecturing, Discussions & Exercises | Building Blocks of  Integrated-Circuit  Amplifiers, Introduction, IC Design Philosophy The Basic Gain Cell |  | 3 | 15 |
| Exam | Lecturing, Discussions & Exercises | The Cascode Amplifier |  | 3 | 16 |
| Exam | Lecturing, Discussions & Exercises | IC Biasing—Current Sources, Current  Mirrors, and Current-Steering Circuits |  | 3 | 17 |
|  |  | Exam (3) |  | 1 | 18 |
| Exam | Lecturing, Discussions & Exercises | Current-Mirror Circuits with Improved  Performance |  | 2 | 18 |
| Exam | Lecturing, Discussions & Exercises | Some Useful Transistor Pairings |  | 3 | 19 |
| Exam | Lecturing, Discussions & Exercises | Output Stages and  Power Amplifiers, Classification of Output Stages, Class A Output Stage |  | 3 | 20 |
| Exam | Lecturing, Discussions & Exercises | Class B Output Stage |  | 3 | 21 |
| Exam | Lecturing, Discussions & Exercises | Class AB Output Stage |  | 3 | 22 |
|  |  | Exam (4) |  | 1 | 23 |
|  |  | Biasing the Class AB Circuit |  | 2 | 23 |
| Exam | Lecturing, Discussions & Exercises | CMOS Class AB Output Stages |  | 3 | 24 |
| Exam | Lecturing, Discussions & Exercises | Power BJTs |  | 3 | 25 |
| Exam | Lecturing, Discussions & Exercises | Variations on the Class AB  Configuration |  | 3 | 26 |
|  |  | IC Power Amplifiers  MOS Power Transistors |  | 3 | 27 |
|  |  | Final Exam |  | 3 | 28 |

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| 12. Infrastructure | | | |
| 1. [Adel S. Sedra](https://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=Adel+S.+Sedra&search-alias=books&field-author=Adel+S.+Sedra&sort=relevancerank) and [Kenneth C. Smith](https://www.amazon.com/s/ref=dp_byline_sr_book_2?ie=UTF8&text=Kenneth+C.+Smith&search-alias=books&field-author=Kenneth+C.+Smith&sort=relevancerank), Microelectronic Circuits (Oxford University Press, 1987) 6th Edition. 2. Behzad Razavi, Fundamentals of Microelectronics, Wiley 2014, Second Edition. 3. Malvino, Albert Paul. Electronic Principles, McGraw-Hill Education, Eighth Edition | | Required reading:  · CORE TEXTS  · COURSE MATERIALS  · OTHER | |
| Internet links related to the topics discussed in the book and class. | | Special requirements (include for example workshops, periodicals, IT software, websites) | |
| None | | Community-based facilities  (include for example, guest  Lectures , internship , field studies) | |
| 13. Admissions | | | |
| ---------- | | Pre-requisites | |
| 60 | | Minimum number of students | |
| 70 | | Maximum number of students | |