

وزارة التعليم العالي والبحث العلمي جهاز
الإشراف والتقويم العلمي
دائرة ضمان الجودة والاعتماد الأكاديمي

استمارة وصف البرنامج الأكاديمي للعام الدراسي ٢٠٢٤_٢٠٢٥ للكليات والمعاهد

الجامعة : جامعة شط العرب الأهلية

الكلية /المعهد : الكلية التقنية الهندسية

القسم العلمي : قسم هندسة تقنيات الأجهزة الطبية

تاريخ ملء الملف : 2025/8/4

التوقيع :

اسم المعاون العلمي: أ.د. كامل حسين السواري

التاريخ :

4/8/2025

الأستاذ الدكتور
كامل حسين السوداني
كيمياء تحليلية

التوقيع :

اسم رئيس القسم : د. نائل جبار

التاريخ : 2025 /8/4



دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي: التاريخ

/ /

التوقيع

مصادقة السيد العميد

أ.م.د. مازن عبدالاله علوان

عميد الكلية التقنية الهندسية

Electronic Circuits I

| Module Information | | | | | |
|------------------------------------|-----------------------|-------------------------|--|--|----------------------|
| معلومات المادة الدراسية | | | | | |
| Module Title | Electronic Circuits I | | Module Delivery | | |
| Module Type | Core | | <div><input checked="" type="checkbox"/> Theory</div> <div><input type="checkbox"/> Lecture</div> <div><input checked="" type="checkbox"/> Lab</div> <div><input checked="" type="checkbox"/> Tutorial</div> <div><input type="checkbox"/> Practical</div> <div><input type="checkbox"/> Seminar</div> | | |
| Module Code | MIET2102 | | | | |
| ECTS Credits | 5 | | | | |
| SWL (hr/sem) | 125 | | | | |
| Module Level | | UGII | | | Semester of Delivery |
| Administering Department | | MIET | College | EETC | |
| Module Leader | Ali Ghazi | | e-mail | Ali7new@mtu.edu.iq | |
| Module Leader's Acad. Title | | Lecturer | Module Leader's Qualification | | M.Sc. |
| Module Tutor | Ilham Sabeeh Ahmed | | e-mail | Ilhamsabeeh414@gmail.com | |
| Peer Reviewer Name | | Prof. Dr. Ahmed R. Ajel | e-mail | Dr_ahmed.r@mtu.edu.iq | |
| Scientific Committee Approval Date | | 8/11/2023 | Version Number | | 1.0 |

| Relation with other Modules | | | |
|-----------------------------------|---|----------|--------|
| العلاقة مع المواد الدراسية الأخرى | | | |
| Prerequisite module | Fundamentals of Electrical Engineering (AC) MIET1201 | Semester | UGI_S2 |
| Co-requisites module | None | Semester | |

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

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|--|--|
| Module Aims أهداف المادة الدراسية | <ol style="list-style-type: none"> 1. The graduate gets scientific and applied skills of electronic circuits. 2. The graduated students will gain the ability of knowledge of different parts of electronic circuits. 3. Development and training the engineering technical staffs on the electronic circuits. 4. Preparation the research and studies to improve and develop the action of electronic circuits. 5. Prepare application engineers in technical and electronic engineering. 6. Put the proposals and alternatives for the electronic devices. |
| Module Learning Outcomes مخرجات التعلم للمادة الدراسية | <ol style="list-style-type: none"> 1. Become aware of the general characteristics of electronic devices. 2. Be able to describe the difference types of electronic categories. 3. Develop a clear understanding of the basic operation and characteristics of electronic devices. 4. Become familiar with the use of equivalent circuits to analyze series, parallel, and series-parallel electronic networks. 5. Be able to predict the output response of an electronic networks. 6. Become familiar with the analysis of and the range of applications for electronic devices. 7. Become familiar with the basic construction and operation of the various types of electronic categories. 8. Be able to test a various type of electronic terminals. 9. Be able to determine the dc levels for the variety of important electronic circuits. 10. Understand how to measure the important voltage levels of electronic circuits. 11. Begin to understand the troubleshooting process as applied to electronic configurations. 12. Develop a sense for the stability factors of an electronic circuits. 13. Learn to use the equivalent model to find the important ac parameters for an amplifier. 14. Develop some skill in troubleshooting ac amplifier networks. |
| Indicative Contents المحتويات الإرشادية | <p>Indicative content includes the following.</p> <p><u>Part A Electronic Theory</u></p> <p>Semiconductor Materials: Ge, Si, and GaAs 2, Covalent Bonding and Intrinsic Materials, n -Type and p -Type Materials , Semiconductor Diode , Transistor Construction ,Transistor Operation , Construction and Characteristics of JFETs ,Transfer Characteristics, Important Relationships ,Depletion-Type MOSFET Enhancement-Type MOSFET [10 hrs]</p> <p>Diode Applications -Load-Line Analysis, Series Diode Configurations, Parallel and</p> |

| | |
|--|---|
| | Series–Parallel Configurations, Sinusoidal Inputs; Half-Wave Rectification Full-Wave Rectification , Clippers , Clampers Networks with a dc and ac Source, Zener Diodes , Voltage-Multiplier Circuits [12 hrs] |
| | Revision problem classes [6 hrs] |
| | <u>Part B - DC Electronic Circuits</u> |
| | BJT Transistor - Operating Point, dc bias configurations of a BJT transistor, Miscellaneous Bias Configurations of a BJT transistor 4.11 Design Operations of a BJT transistor, Multiple BJT Networks, Current Mirrors. [13 hrs] |
| | FET Transistor - biasing arrangements for the n and p channel JFET, 7.7 Depletion-Type MOSFETs, Enhancement-Type MOSFETs, Combination Networks, Universal JFET Bias, Practical Applications. [10 hrs] |
| | <u>Part C - AC Electronic Circuits</u> |
| | BJT Transistor - Amplification in the AC Domain, BJT Transistor Modeling, the r_e Transistor Model, Effect of R_L and R_s , Determining the Current Gain, Cascaded Systems, Darlington Connection, Feedback Pair, The Hybrid Equivalent Model. [17 hrs] |

| Learning and Teaching Strategies استراتيجيات التعلم والتعليم | |
|--|---|
| Strategies | The main strategy will be encourage active participation and engagement of students through activities such as group discussions, hands-on experiments, problem-solving tasks, and case studies. This approach promotes critical thinking, collaboration, and knowledge application and encourages students to explore and discover knowledge through inquiry and investigation. Pose open-ended questions or problem scenarios that require learners to research, analyze, and draw conclusions independently. |

| Student Workload (SWL) الحمل الدراسي للطالب | | | |
|--|-----|---|---|
| Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا | 5 |
| Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل | 46 | Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا | 3 |
| Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل | 125 | | |

| Module Evaluation تقييم المادة الدراسية | | | | | |
|--|------------------------|-------------|------------------|------------|---------------------------|
| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
| Formative assessment | Quizzes | 2 | 16% (16) | 5,10 | LO #1,2,10 and 11 |
| | Assignments | 2 | 8% (8) | 2,12 | LO # 3,4 ,6,7 and 14 |
| | Projects / Lab. | 1 | 8% (8) | continuous | |
| | Report | 1 | 8% (8) | 13 | LO # 5,8 and 10 |
| Summative assessment | Midterm Exam | 2 hr | 10% (10) | 8 | LO # 1,2,5,9,10 and 13 |
| | Final Exam | 4hr | 50% (50) | 16 | All |
| Total assessment | | | 100% (100 Marks) | | |

| Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري | |
|--|--|
| | Material Covered |
| Week 1 | Introduction - |
| Week 2 | Semiconductors materials |
| Week 3 | Diode Configurations |
| Week 4 | Diode Networks with a dc and ac Source |
| Week 5 | Zener Diodes |
| Week 6 | Bipolar junction transistor |
| Week 7 | Mid-term Exam |
| Week 8 | DC biasing BJTs |
| Week 9 | Multiple BJT Networks |
| Week 10 | Field effect transistor and MOSFET |
| Week 11 | Depletion-Type MOSFET |

| | |
|----------------|---|
| Week 12 | Enhancement type MOSFET |
| Week 13 | BJT AC Analysis |
| Week 14 | BJT Transistor Modeling and Effect of RL and Rs |
| Week 15 | Preparatory week before final exam |

| Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر | |
|---|---|
| | Material Covered |
| Week 1 | Lab 1: Diode characteristics |
| Week 2 | Lab 2: Half – wave Rectifier |
| Week 3 | Lab 3: full wave Rectifier |
| Week 4 | Lab 4: Filter for Halve – wave and full wave Rectifiers |
| Week 5 | Lab 5: Voltage Doubler |
| Week 6 | Lab 6: Voltage Tripler |
| Week 7 | Lab 7: Positive Series Clipper |
| Week 8 | Lab 8: Negative Series Clipper |
| Week 9 | Lab 9: positive parallel Clipper |
| Week 10 | Lab 10: Negative parallel Clipper |
| Week 11 | Lab 11: Clamper |
| Week 12 | Lab12: Zener Diode |
| Week 13 | Lab13: Fixed V_i , Variable RL Zener Diode |
| Week 14 | Lab14: Fixed RL , Variable V_i Zener Diode |

| Learning and Teaching Resources مصادر التعلم والتدريس | | |
|---|---|----------------------------------|
| | Text | Available in the Library? |
| Required Texts | Electronic devices and circuit theory 11th edition, Robert L. Boylestad , Louis Nashelsky | Yes |
| Recommended Texts | | No |
| Websites | https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering | |

| Grading Scheme مخطط الدرجات | | | | |
|--|-------------------------|---------------------|-----------|---------------------------------------|
| Group | Grade | التقدير | Marks (%) | Definition |
| Success Group (50 - 100) | A - Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | B - Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | C - Good | جيد | 70 - 79 | Sound work with notable errors |
| | D - Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | E - Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| Fail Group (0 – 49) | FX – Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | F – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |
| Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. | | | | |