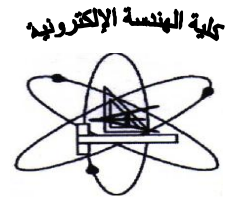


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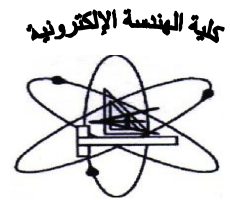


Department offering the program: Electronics and Electrical Communications Engineering
Department offering the course: Electronics and Electrical Communications Engineering

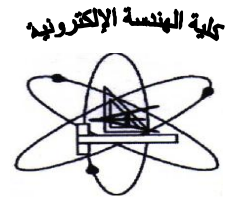
Course Specification

| 1. Course Basic Information | | |
|---|---|---|
| Code: ECE 213 Department requirement | Title: Electrical Circuits | Academic year: 2015-2016 Level (2) – Semester (1st) |
| Field: Basic Eng. Science | Teaching hours: Lecture [2] Tutorial [1] Lab [0] | |

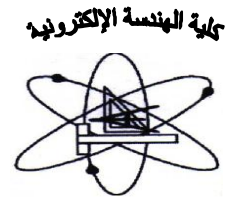
| | |
|--|--|
| 2. Course Objectives | <ol style="list-style-type: none"> To introduce students to fundamental theories and methodologies for analyzing DC, and AC circuits. To equip students a good knowledge of determining Complex impedance, Power and power factor. To provide students some skills to understand Coupling and Resonance circuits. To prepare students to understand Nonlinear circuit analysis. To introduce students to the concepts of two port networks. To teach students the use of circuit simulation and software packages (CAD) for DC and AC circuits. |
| 3. Intended learning outcomes: ARS | Course ILOs |
| A- Knowledge and understanding A.1 Explain concepts and theories of mathematics and sciences, appropriate to Electrical Circuits . A.2 Outline basics of information and communication technology (ICT) A.5 Demonstrate methodologies of solving engineering problems, data collection, and interpretation. | A1.1 Explain concepts and theories of mathematics and sciences, appropriate to DC circuit analysis . A1.2 Explain concepts and theories of mathematics and sciences, appropriate to A.C. fundamentals . A1.3 Explain concepts and theories of mathematics and sciences, appropriate to Power analysis in A.C. circuit . A1.4 Explain concepts and theories of AC analysis . A1.5 Explain concepts and theories of Coupling circuits . A1.6 Explain concepts and theories of Resonance circuits . A1.7 Explain concepts and theories of Non linear circuits . A1.8 Explain concepts and theories of Two port networks . A2.1 Outline basics CAD for circuit analysis and solutions . A5.1 Demonstrate methodologies of solving A.C. circuit . A5.2 Demonstrate methodologies of solving Multi-frequency Drivers circuits . A.5.3 Demonstrate methodologies of solving Coupling circuits problems. A.5.4 Demonstrate methodologies of solving Resonance circuits problems. A.5.5 Demonstrate methodologies of solving Non linear circuit problems. A.5.6 Demonstrate methodologies of solving Two port networks problems. |



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|------------------------|--|--|
| B- Intellectual skills | <p>B.1 Select appropriate mathematical and computer-based methods for modeling and analyzing problems.</p> <p>B.2 Select appropriate solutions for engineering problems based on analytical thinking.</p> <p>B.8 Select and appraise appropriate ICT tools to a variety of engineering problems.</p> | <p>B1.1 Select appropriate mathematical and computer-based methods for analyzing DC circuit problems.</p> <p>B1.2 Select appropriate mathematical and computer-based methods for analyzing Power in A.C. circuit problems.</p> <p>B1.3 Select appropriate mathematical and computer-based methods for analyzing AC circuits problems.</p> <p>B1.4 Select appropriate mathematical and computer-based methods for analyzing Multi-frequency Drivers circuits problems.</p> <p>B1.5 Select appropriate mathematical and computer-based methods for analyzing Coupling circuits problems.</p> <p>B1.6 Select appropriate mathematical and computer-based methods for analyzing Resonance circuits problems.</p> <p>B1.7 Select appropriate mathematical and computer-based methods for analyzing Non linear circuits problems.</p> <p>B1.8 Select appropriate mathematical and computer-based methods for analyzing Two port networks problems.</p> <p>B2.1 Select appropriate solutions for DC circuits problems based on analytical thinking.</p> <p>B2.2 Select appropriate solutions for Power in A.C. circuit problems based on analytical thinking.</p> <p>B2.3 Select appropriate solutions for A.C. circuits problems based on analytical thinking.</p> <p>B2.4 Select appropriate solutions for Multi-frequency Drivers circuits problems based on analytical thinking.</p> <p>B2.5 Select appropriate solutions for Coupling circuits problems based on analytical thinking.</p> <p>B2.6 Select appropriate solutions for Resonance circuits problems based on analytical thinking.</p> <p>B2.7 Select appropriate solutions for Non linear circuits problems based on analytical thinking.</p> <p>B2.8 Select appropriate solutions for Two port networks problems based on analytical thinking..</p> <p>B8.1 Select and appraise appropriate CAD tools to a variety of DC and AC circuits problems.</p> |
| | C- Professional skills | <p>C.1 Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.</p> |



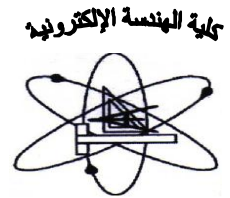
| | | |
|---|--|---|
| | <p>C.6 Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to electrical circuits and develop required computer programs.</p> | <p>C1.6 Apply knowledge of mathematics, and science to solve Resonance circuits problems. C1.7 Apply knowledge of mathematics, and science to solve Non linear circuits problems. C1.8 Apply knowledge of mathematics, and science to solve Two port networks problems.</p> <p>C6.1 Use a wide range of analytical tools, techniques pertaining to DC circuit problems. C.6.2 Use a wide range of analytical tools, techniques pertaining to power problems. C.6.3 Use a wide range of analytical tools, techniques pertaining to AC circuit problems. C6.4 Use a wide range of analytical tools, techniques pertaining to Multi-frequency Drivers problems. C6.5 Use a wide range of analytical tools, techniques pertaining to Coupling circuits problems. C6.6 Use a wide range of analytical tools, techniques pertaining Resonance circuits problems. C6.7 Use a wide range of analytical tools, techniques pertaining to nonlinear circuits problems. C6.8 Use a wide range of analytical tools, techniques pertaining to Two port networks problems.</p> |
| <p>D- General skills</p> | <p>D.3. Communicate effectively.</p> <p>D.6. Effectively manage tasks, time, and resources.</p> <p>D.7 Search for information and engage in life-long self-learning electrical circuit basics and principles.</p> | <p>D3.1 Communicate effectively, clearly and use the appropriate medium, including written and oral in class room and in lecture time.</p> <p>D6.1 Effectively manages tasks, time, and resources at the time of solving problems, writing reports, and doing exams.</p> <p>D7.1 Search for information and engage in electrical circuit basics and principles life-long self-learning and continue to be motivated to learn new subjects.</p> |
| <p>4. Course contents</p> | <p>Introduction to DC circuit analysis and Circuit theories- A.C. fundamentals - Power analysis in A.C. circuit - Theories of AC analysis - Method of A.C. circuit solutions – Multi-frequency Drivers - Coupling circuits- Resonance circuits – Non linear circuit analysis- Two port networks- CAD for circuits .</p> | |
| <p>5. Teaching and learning methods</p> | <ul style="list-style-type: none"> - Lectures - Tutorials - Reports | |
| <p>6. Teaching and Learning Methods for disable students</p> | <ul style="list-style-type: none"> • Official low cost special classes for developing student skills, arranged by the faculty administration. • Assign a portion of the office hours for those students. • Repeat the explanation of some of the material at tutorials. | |



| 7. Student assessment | |
|--|---|
| a- Assessment methods | - Weekly sheet exercises at class room - Quizzes - Mid-term and final exams |
| b- Assessment schedule | - Exercise sheet: Weekly - Quiz 1: Week <u>no</u> 4 - Mid-term exam: Week <u>no</u> 8 - Quiz 2: Week <u>no</u> 12 - Final-term examination: Week <u>no</u> 16 |
| c- Weighting of assessment | - Class tutorial and quizzes: 10 % - Mid-term examination: 20 % - Final-term examination: <u>70 %</u> Total 100 % |
| 8. List of text books and references | |
| a- Course notes | - There are lecture notes prepared in the form of a book authorized by the department |
| b- Text books | - James W. Nilsson and Susan Reidel, Electric Circuits, 8 th ed, Prentice Hall, Upper Saddle River, NJ, 2010. |
| c-Recommended books | [1] Charles K. Alexander and Matthew N.O. Sadiku, "Fundamentals of Electric Circuits", 4 th edition, McGraw-Hill, 2009 [2] James W. Nilsson and Susan A. Riedel, Introduction to PSPICE Manual: Electric Circuits, 4th edition, Prentice Hall, 2000. [3] Steven T. Karris, Circuit Analysis II with MATLAB® Applications, Orchard Publications, 2003. |
| d- Periodicals, Web sites, etc. | www.hyperstaffs.info/work/physics/child/index.html www.andythelwell.com/blobz www.zephyrus.co.uk/circuits1.html www.ddpp.com/DDPP3_pdf/elecCkts.pdf http://www.allaboutcircuits.com/textbook/direct-current/chpt-2/computer-simulation-electric-circuits/ www.teachersdomain.org/.../phy03.sci.phys.mfw.zalarm |

Course contents - ILOs Matrix

| Content topics | Week | A- Knowledge & understanding | B- Intellectual skills | C- Professional and practical skills | D- General and transferable skills |
|--|------|------------------------------|------------------------|--------------------------------------|------------------------------------|
| Introduction to DC circuit analysis and Circuit theories | 1 | A1.1, A.5 | B1.1, B2.1 | C1.1, C6.1 | D3.1, D6.1, D7.1 |
| A.C. fundamentals | 2 | A1.1 | | | D3.1, D6.1, D7.1 |
| Power analysis in A.C. circuit | 3 | A1.3 | B1.2, B2.2 | C1.2, C6.2 | D3.1, D6.1, D7.1 |
| Theories of AC analysis | 4 | A1.4, A.5 | | | D3.1, D6.1, D7.1 |
| Method of A.C. circuit solutions | 5-7 | A.1, A5.1 | B1.3, B2.3 | C1.3, C6.3 | D3.1, D6.1, D7.1 |
| Multi-frequency | 9 | A5.2 | B1.4, B2.4 | C1.4, C6.4 | D3.1, D6.1, D7.1 |



| | | | | | |
|------------------------------------|-------|------------|------------|------------|------------------|
| Drivers | | | | | |
| Coupling circuits | 10 | A1.5, A5.3 | B1.5, B2.5 | C1.5, C6.5 | D3.1, D6.1, D7.1 |
| Resonance circuits | 11 | A1.6, A5.4 | B1.6, B2.6 | C1.6, C6.6 | D3.1, D6.1, D7.1 |
| Non linear circuit analysis | 12 | A1.7, A5.5 | B1.7, B2.7 | C1.7, C6.7 | D3.1, D6.1, D7.1 |
| Two port networks | 13 | A1.8, A5.6 | B1.8, B2.8 | C1.8, C6.8 | D3.1, D6.1, D7.1 |
| CAD for circuits | 14-15 | A2.1 | B8.1 | | D3.1, D6.1, D7.1 |

Teaching and learning methods - ILOs Matrix

| Teaching and learning methods | A. Knowledge & understanding | B. Intellectual skills | C. Professional & practical skills | D. General & transferable skills |
|-------------------------------|------------------------------|------------------------|------------------------------------|----------------------------------|
| Lectures | A.1, A.5 | B.1, B.2, B.8 | C.1, C.6 | D.3, D.7, D.9 |
| Tutorials | A.1, A.5 | B.1, B.2, B.8 | C.1, C.6 | D.3 |
| Exercises | A.1, A.5 | B.1, B.2, B.8 | C.1, C.6 | D.3, D.7, D.9 |

Assessment methods - ILOs Matrix

| Assessment methods | A. Knowledge & understanding | B. Intellectual skills | C. Professional & practical skills | D. General & transferable skills |
|----------------------------------|------------------------------|------------------------|------------------------------------|----------------------------------|
| Weekly sheet exercises | A.1, A.5 | B.1, B.2, B.8 | C.1, C.6 | D.3, D.6 |
| Reports | A.1, A.5 | B.1, B.2, B.8 | C.1, C.6 | D.3, D.6, D.7 |
| Quizzes | A.1, A.5 | B.1, B.2 | C.1, C.6 | |
| Mid-term and Final written exams | A.1, A.5 | B.1, B.2 | C.1, C.6 | D.6, D.7 |

Authorized from department board at 15/05/2016

Authorized from college board at 05/06/2016

Course coordinator:

Prof. Mohamed F. Elkordy

Head of Department:

Prof. Fathi El-Sayed Abd El-Samie