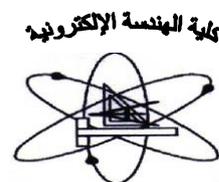


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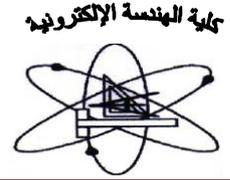


Department offering the program: Electronics and Electrical Communications
Department offering the course: Industrial Electronics and Control Engineering

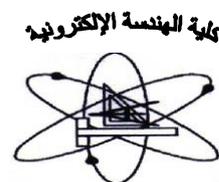
Course Specification

| 1.Course Basic Information | | |
|--|---------------------------------------|--|
| Code: ACE 125 | Title: Electrical Measurements | Academic year: 2015-2016 |
| Department Requirement | | Level (1) – Semester (2nd) |
| Field: Basic Engineering Sciences | Teaching hours: Lecture [2] | Tutorial [0] Lab [1] |

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|--|--|--|
| 2.Course objectives | <ol style="list-style-type: none"> 1. To introduce students to Measurement systems. 2. To enhance student ability to explain the purpose of standards. 3. To enhance student ability to demonstrate the importance of correct interpretation of data. 4. To acquire student the skills to differentiate among different sources of measurement errors. 5. To provide students basic statistical methods for handling errors. 6. To teach students the analysis and design of attenuators. 7. To teach students direct and alternating current indicating instruments. 8. To provide students with DC and AC bridges 9. To enhance student ability to demonstrate the design and use of oscilloscopes. | |
| 3.Intended Learning Outcomes: ARS | Course ILOs | |
| A- Knowledge and Understanding: | <p>A.1. Explain concepts and theories of mathematics and sciences, appropriate to Electrical Measurements.</p> <p>A.4. Demonstrate principles of design including elements design, process and/or a system related to Electrical Measurements.</p> <p>A.5. Demonstrate methodologies of solving engineering problems, data collection and interpretation in Electrical Measurements.</p> | <p>A1.1 Explain concepts and theories of sciences, appropriate to Measurement systems.</p> <p>A1.2 Explain concepts and theories of mathematics appropriate to Attenuators.</p> <p>A4.1 Demonstrate principles of design for Attenuators.</p> <p>A4.2 Demonstrate principles of design related to direct and alternating current indicating instruments.</p> <p>A4.3 Demonstrate principles of design related to DC and AC bridges.</p> <p>A4.4 Demonstrate principles of design related to Oscilloscopes.</p> <p>A5.1 Demonstrate methodologies of data collection and interpretation using Attenuators.</p> <p>A5.2 Demonstrate methodologies of data collection and interpretation using direct and alternating current indicating instruments.</p> <p>A5.3 Demonstrate methodologies of data collection and interpretation using DC and AC bridges.</p> <p>A5.4 Demonstrate methodologies of data collection and interpretation using Oscilloscopes.</p> |



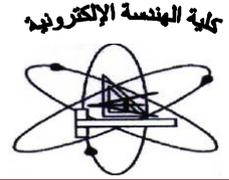
| | | |
|-------------------------------|--|--|
| | A.8. Describe current engineering technologies as related to Electrical Measurements. | A8.1 Describe current engineering technologies as related to Attenuators. A8.2 Describe current engineering technologies as related to Direct and alternating current indicating instruments. A8.3 Describe current engineering technologies as related to Oscilloscopes. |
| B- Intellectual Skills | B.5. Assess and evaluate the characteristics and performance of components, systems and processes in Electrical Measurements. | B5.1 Assess and evaluate the characteristics and performance of Attenuators. B5.2 Assess and evaluate the characteristics and performance of Direct and alternating current indicating instruments. B5.3 Assess and evaluate the characteristics and performance of DC bridges and AC bridges. B5.4 Assess and evaluate the characteristics and performance of Oscilloscopes. |
| C- Professional Skills | C.5. Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results. C.8. Apply safe systems at work and observe the appropriate steps to manage risks. C.12. Prepare and present technical reports. | C5.1 Use direct or alternating current indicating instruments to design experiments, collect, analyze and interpret results. C5.2 Use DC bridges or AC bridges to design experiments, collect, analyze and interpret results. C5.3 Use Oscilloscopes to design experiments, collect, analyze and interpret results. C8.1 Apply Attenuators at laboratory work and observe the appropriate steps to manage risks. C12.1 Prepare and present technical reports on Measurement errors. C12.2 Prepare and present technical reports on Error detection in cables. |
| D- General Skills | D.1. Collaborate effectively within multidisciplinary team. D.2. Work in stressful environment and within constraints. D.3. Communicate effectively. D.6. Effectively manage tasks, time, and resources. | D1.1 Collaborate effectively within multidisciplinary team during Laboratory sessions. D2.1 Work in stressful environment and within constraints to finish experimental tasks. D3.1 Communicate effectively in Laboratory times with colleagues and demonstrator. D.6.1. Effectively manage tasks, time, and resources during preparation of assigned lab task, and exams. |
| 4.Course Contents | Introduction to Measurement systems – Measurement errors – Attenuators – Direct and alternating current indicating instruments – DC bridges – AC bridges – Error detection in cables - Oscilloscopes. | |
| 5.Teaching and | <ul style="list-style-type: none"> Lectures | |



| | |
|--|--|
| Learning Methods | <ul style="list-style-type: none"> Labs Reports |
| 6. Teaching and Learning Methods for disable students | <ul style="list-style-type: none"> Official low cost special classes for developing student skills, arranged by the faculty administration. Give the students specific tasks. Repeat the explanation of some of the material and tutorials. Scheduled time in order to improve their skills. |
| 7. Student Assessment | |
| <ul style="list-style-type: none"> Assessment Methods | <ul style="list-style-type: none"> Weekly laboratory tasks and reports Quizzes Midterm, and final exams |
| <ul style="list-style-type: none"> Assessment Schedule | <ul style="list-style-type: none"> Weekly laboratory tasks and reports: Weekly Quizz-1: Week <u>no</u> 5 Mid-Term exam: Week <u>no</u> 8 Oral and practical lab. exam: Week <u>no</u> 15 Final – term examination: Week <u>no</u> 16 |
| <ul style="list-style-type: none"> Weighting of Assessment | <ul style="list-style-type: none"> Semester lab. work and quizzes : 10 % Mid-term examination: 10 % Oral and practical lab. exam 20 % Final – term examination: 60 % Total 100 % |
| 8. List of Text Books and References: | |
| a- Course notes | There are lectures notes prepared in the form of a book authorized by the department. |
| b- Text books | N.Sanjay and R. Akhilesh, " Electronics measurement and instrumentation ", Dhanpat Rai Publishing Company , 2004. |
| c- Recommended books | J.B. Gupta" A Course In Electronics & Electrical Measurements And Instrumentation", Modern Media, 2006. |
| d- Periodicals, Web sites, etc. | <ul style="list-style-type: none"> www.measurement.com www.instrumentation.com |

Course Contents - ILOs Matrix

| Content Topics | Week | A- Knowledge & Understanding | B- Intellectual skills | C- Professional and practical skills | D- General and transferable skills |
|--|------|------------------------------|------------------------|--------------------------------------|------------------------------------|
| Measurements and measurement systems | 1 | A1.1 | | | D1.1, D2.1, D3.1, D6.1 |
| Measurement errors; Data and data analysis | 2-3 | A5.1, A5.2, A5.3, A5.4 | | C12.1 | D1.1, D2.1, D3.1, D6.1 |
| Attenuators | 4-5 | A1.2, A5.1, A8.1 | B5.1 | C8.1 | D1.1, D2.1, D3.1, D6.1 |
| DC indicating instruments | 6-7 | A5.2, A8.2 | B5.2 | C5.1 | D1.1, D2.1, D3.1, D6.1 |
| AC indicating instrument | 9-10 | A5.2, A8.2 | B5.2 | C5.1 | D1.1, D2.1, |



| | | | | | |
|---|-------|------|------|-------------|------------------------|
| | | | | | D3.1, D6.1 |
| Dc and AC Bridges measurements | 11-12 | A5.3 | B5.3 | C5.2 | D1.1, D2.1, D3.1, D6.1 |
| Error detection in cables-Oscilloscopes | 13-15 | A5.4 | B5.4 | C5.3, C12.2 | D1.1, D2.1, D3.1, D6.1 |

Teaching and Learning Methods - ILOs Matrix

| Teaching and Learning Methods | D. General & Transferable Skills | C. Professional & practical Skills | B. Intellectual Skills | A. Knowledge & Understanding |
|-------------------------------|----------------------------------|------------------------------------|------------------------|------------------------------|
| Lectures | A.1, A.5, A.8 | B.5 | - | D.3 |
| Labs | A.1, A.5, A.8 | B.5 | C.5, C.12 | D.1, D.2, D.3, D.6 |
| Reports | A.1, A.5, A.8 | B.5 | C.12 | D.1, D.2, D.3, D.6 |

Assessment Methods - ILOs Matrix

| Assessment Methods | D. General & Transferable Skills | C. Professional & practical Skills | B. Intellectual Skills | A. Knowledge & Understanding |
|----------------------------------|----------------------------------|------------------------------------|------------------------|------------------------------|
| Weekly laboratory tasks | A.1, A.5, A.8 | B.5 | C.5, C.12 | D.1, D.2, D.3, D.6 |
| Reports | A.1, A.5, A.8 | B.5 | C.12 | D.1, D.2, D.3, D.6 |
| Oral and practical exam | A.1, A.5, A.8 | B.5 | C.5 | D.2, D.6 |
| Quizzes | A.1, A.5, A.8 | B.5 | - | D.2, D.6 |
| Midterm, and Final written exams | A.1, A.5, A.8 | B.5 | C.5, C.12 | D.2, D.6 |

Authorized from department board at 15/05/2016

Authorized from college board at 05/06/2016

Course coordinator:
Prof.Dr. Gomaa El-Far

Head of Department:
Prof. Fathi El-Sayed Abd El-Samie