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|  | **ECTS Course Description Form** |
| **PART I ( Senate Approval)** |
| **Offering School**  | **Engineering** |
| **Offering department** | **Electrical and Electronics Engineering** |
| **Program(s) Offered to** | **Electrical and Electronics Engineering** | **Compulsory** |
| **Computer Engineering** | **Elective** |
| **Industrial Engineering** | **Elective** |
| **Course Code**  | **EE 202L** |
| **Course Name** | **Circuit Theory 2 Laboratory** |
| **Language of Instruction** | **English** |
| **Type of Course** | *Course/Laboratory* |
| **Level of Course** | **Undergraduate** |
| **Hours per Week** | **Lecture: 0** | **Laboratory: 2** | **Recitation:**  | **Practical:**  | **Studio:** | **Other:** |
| **ECTS Credit** | **2** |
| **Grading Mode** | **Letter Grade** |
| **Pre-requisites** | *EE 201 and EE 201L* |
| **Co-requisites** | *EE 202 Circuit Theory II and EE 202L Circuit Theory II Laboratory courses should be taken concurrently within a semester* |
| **Registration Restriction** | *-* |
| **Educational Objective** | This laboratory course is focused on the experimental application of the knowledge gained in EE 202 class. Experiments include basic circuit elements and opamps driven with sinusoidal voltages, as well as power analysis with alternative current. |
| **Course description** | Experiments on phasors, sinusoidal analysis and ac power |
| **Learning Outcomes** | **LO1** | Apply circuit laws and analysis techniques in AC circuits |
|  | **LO2** | Use phasors for AC circuit analysis |
|  | **LO3** | Analyze AC circuits containing op amps |
|  | **LO4** | Analyze and understand three phase systems |
| **PART II ( Faculty Board Approval)** |
| **Basic Outcomes (University-wide)** | **No.** | **Program Outcomes** | **LO1** | **LO2** | **LO3** | **LO4** |  |  |
| **PO1** | **Ability** to communicate effectively and write and present a report in Turkish and English.  | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO2** | **Ability** to work individually, and in intra-disciplinary and multi-disciplinary teams. | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO3** | **Recognition** of the need for life-long learning and **ability** to access information , follow developments in science and technology, and continually reinvent oneself. | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO4** | **Knowledge** of project management, risk management, innovation and change management, entrepreneurship, and sustainable development. | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO5** | **Awareness** of sectors and **ability** to prepare a business plan. | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO6** | **Understanding** of professional and ethical responsibility and **demonstrating** ethical behavior. | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **Faculty Specific Outcomes** | **PO7** | **Ability to develop, select and use modern techniques and tools necessary for engineering applications and ability to use information technologies effectively.** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO8** | **Recognition of the effects of engineering applications on health, environment and safety in the universal and societal dimensions and the problems of the time and awareness of the legal consequences of engineering solutions.** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO9** | **Ability to identify, define, formulate and solve complex engineering problems; and electing and applying appropriate analysis and modelling methods for this purpose.** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **Discipline Specific Outcomes (program)** | **PO10** | **Gains comprehensive knowledge in mathematics, natural sciences, related engineering fields and general engineering subjects.** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO11** | **Able to identify complex engineering problems and solve them with appropriate methods of analysis.** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO12** | **Able to design a complex electronic system that meets the desired performance by using modern design techniques and taking real life conditions into account.** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO13** | **Able to develop new techniques and tools for solution of current engineering problems.** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO14** | **Able to use computer software and hardware technologies together with information technologies in an effective way.** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO15** | **Able to produce innovative solutions for solution of current engineering problems by gathering data through experiment design and interpretation of results.** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO16** | **Able to actively work individually or in teams where engineers from the same or different disciplines are involved.** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO17** | **Gains competency in effective written and verbal communication, presentation and preparation of technical reports in Turkish and English.**  | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO18** | **Constantly increases knowledge with the awareness of lifelong learning by closely following the developments in science and technology .** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO19** | **Acts in accordance with scientific and ethical principles and the standards used in engineering practice at every stage of career** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO20** | **Able to describe concepts related to business life such as project management, risk management, change management, entrepreneurship and sustainability.** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO21** | **Gains awareness of the legal consequences of engineering solutions developed together with the effect of engineering applications on health, environment and safety on a universal and social scale.** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO22** | **Able to solve problems involving probability and statistics, derivative and integral calculations, multivariable mathematics, linear algebra, differential equations, and complex variables, and their electrical and electronics applications.** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO23** | **Able to organize projects and events for the social environment they live in with the awareness of social responsibility and implement them.** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
| **PO24** | **Able to plan and direct activities for employees under their responsibility to develop within the framework of a project.** | 🗸 | 🗸 | 🗸 | 🗸 |  |  |
|  |  |  |  |  |  |  |  |  |
| **PART III ( Department Board Approval)** |
| **Course Subjects, Contribution of Course Subjects to Learning Outcomes, and Methods for Assessing Learning of Course Subjects** | **Subjects** | **Week** |  | **LO1** | **LO2** | **LO3** | **LO4** | **LO5** | **LO6** |
| **S1** | *3* | Experiment on sinusoids and phasors, phasor relationships for circuit elements  | *A1-A4-A8* | *A1-A4-A8* | *A1-A4-A8* | *A1-A4-A8* |  |  |
| **S2** | *5* | Experiment on steady state analysis, Nodal and Mesh analysis, superposition theorem  | *A1-A4-A8* | *A1-A4-A8* | *A1-A4-A8* | *A1-A4-A8* |  |  |
| **S3** | *7* | Experiment on Thevenin and Norton equivalent circuits, Op amp AC circuits, and ac power analysis  | *A1-A4-A8* | *A1-A4-A8* | *A1-A4-A8* | *A1-A4-A8* |  |  |
| **S4** |  |  |  |  |  |  |  |  |
| **S5** |  |  |  |  |  |  |  |  |
| **S6** |  |  |  |  |  |  |  |  |
| **S7** |  |  |  |  |  |  |  |  |
| **S8** |  |  |  |  |  |  |  |  |
| **S9** |  |  |  |  |  |  |  |  |
| **S10** |  |  |  |  |  |  |  |  |
| **S11** |  |  |  |  |  |  |  |  |
| **S12** |  |  |  |  |  |  |  |  |
| **S13** |  |  |  |  |  |  |  |  |
| **S14** |  |  |  |  |  |  |  |  |
| **Assessment Methods, Weight in Course Grade, Implementation and Make-Up Rules**  | **No.** | **Type** | **Weight** | **Implementation Rule** | **Make-Up Rule** |
| **A1** | **Exam** |  |  |  |
| **A2** | **Quiz** | *%20* | *A quiz with two questions is applied in the beginning of each lab. Only calculators are allowed.*  | The student is informed about a make up in case his/her excuse is valid and an accompanying doctors report is provided. |
| **A3** | **Homework** |  |  |  |
| **A4** | **Project** |  |  |  |
| **A5** | **Report** | %30 | A lab report is submitted that summarizes the experiment and obtained results after each experiment. | The student is informed about a make up in case his/her excuse is valid and an accompanying doctors report is provided. |
| **A6** | **Presentation** |  | - | - |
| **A7** | **Attendance/ Interaction** |  | - | - |
| **A8** | **Class/Lab./****Field Work** | %50 | Experiments as part of the class are performed by the students in groups.  | The student is informed about a make up lab in case his/her excuse is valid and an accompanying doctors report is provided. |
| **A9** | **Other** |  |  |  |
| **TOTAL** | **100%** |
| **Evidence of Achievement of Learning Outcomes** | At least one question from each experiment is asked during the quizzes. Students are required to perform the lab experiments and write a report for each lab and the project. A weighted average is calculated for each student based on the percentage of each assessment method. Students are required to collect a minimum score over 100, which is announced by the instructor, to pass the course. This score is determined based on class average. |
| **Method for Determining Letter Grade** | The scores of 3 exams, 3 labs and the project are used to calculate the final score. Maximum scores from each contributor is shown below.

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| --- | --- | --- | --- | --- | --- | --- |
| Assesment | Quiz | Reports |  | Lab |  | Total |
| Point | 20 | 30 |  | 50 |  | 100 |

The table below is used to conver the total point over 100 to letter grade:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Point | 100-75 | 74-70  | 69-65 | 64-60 | 59-55 | 54-50 | 49-45 | 44-40 | 39-35 | 34-30 |
| Grade | A | A- | B+ | B | B- | C+ | C | C- | D+ | D |

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| **Teaching Methods, Student Work Load** | **No** | **Method** | **Explanation** | **Hours** |
| ***Time applied by instructor*** |
| **1** | **Lecture** |  |  |
| **2** | **Interactive Lecture** |  |  |
| **3** | **Recitation** |  |  |
| **4** | **Laboratory** | Experiments from the class content are performed | *3x4* |
| **5** | **Practical** |  |  |
| **6** | **Field Work** |  |  |
| ***Time expected to be allocated by student*** |
| **7** | **Project** |  |  |
| **8** | **Homework** | A report on the lab work is prepared | *3x10* |
| **9** | **Pre-class Learning of Course Material**  | Next class’ material is read before the class | *3x2* |
| **10** | **Review of Course Material** |  |  |
| **11** | **Studio** |  |  |
| **12** | **Office Hour** | Questions and technical aspects regarding experiments are discussed | 3x2 |
| **TOTAL** | *54* |
| **IV. PART** |
| **Instructor** | **Name** | Mustafa İlker Beyaz |
| **E-mail** | mibeyaz@antalya.edu.tr |
| **Phone Number** | 0242 245 0367 |
| **Office Number** | 0242 245 0367 |
| **Office Hours** | *Determined during each semester, 2 hours per week* |
| **Course Materials** | **Mandatory** | *ABU EE 202L Laboratory Manuel* |
| **Recommended** |  |
| **Other** | **Scholastic Honesty** | Violations of scholastic honesty include, but are not limited to cheating, plagiarizing, fabricating information or citations, facilitating acts of dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. Any for of scholastic dishonesty is a serious academic violation and will result in a disciplinary action. |
| **Students with disabilities** | Reasonable accommodations will be made for students with verifiable disabilities. |
| **Safety Issues**  | The course does not require any special safety precautions. |
| **Flexibility** | Circumstances may arise during the course that prevents the instructor from fulfilling each and every component of this syllabus; therefore, the syllabus is subject to change.  Students will be notified prior to any changes.  |