*Recommended template: “Course Description, Syllabus, Course Requirements”*

# course syllabus and course requirements academic year … semester …

|  |  |
| --- | --- |
| Course title | Electrical Safety Technology |
| **Course Code** | IVB457ANVM |
| **Hours/Week: le/pr/lab** | 2/1 |
| **Credits** | 4 |
| **Degree Programme** | Electrical Engineer |
| **Study Mode** | Full time |
| **Requirements** | Midterm |
| **Teaching Period** | 5. |
| **Prerequisites** | Electrical Engineering (IVB468ANVM) |
| **Department(s)**  **Course Director** | dr. Kvasznicza Zoltán |
| **Teaching Staff** | Showqi Hageb |
|  |  |

# course description

*A short description of the course (max. 10 sentences).*

*Neptun: Instruction/Subjects/Subject Details/Basic data/Subject description*

Electrical power generating, three phase system, the danger of electricity, electrical shock, protecting methods, protecting devices.

# syllabus

*Neptun: Instruction/Subjects/Subject Details/Syllabus*

## **goals and objectives**

*Goals, student learning outcome.*

*Neptun: Instruction/Subjects/Subject Details/Syllabus/Goal of Instruction*

The aim of this subject is to give general knowledge about Electrical Safety Technology, electric shock and protecting against electric shock by using different methods.

## **course content**

*Neptun: Instruction/Subjects/Subject Details/Syllabus/Subject content*

|  |  |
| --- | --- |
|  | TOPICS |
| LECTURE | 1. Introduction to Electrical Safety Technology, single and three phase systems, Isolating transformer and Auto transformer 2. Purpose of studying Electrical Safety Technology, Electricity and its danger to humans, the basics of electrical protection, electric shock, factors influencing the physiological effect of electric current, safe limits of voltage and current value on the human body, 3. Effects of electric current on the human body, different effects of AC and DC on the human body, Resistance of the human body, preface about earthing systems. 4. Protecting methods against electric shock, earthing systems (TT, TN, IT), (TN-c, TN-C-S). 5. Solving numerical problems regarding to the earthing systems. 6. Measurements on the demonstration board, measurements of insulation resistance, the continuity of PE conductors, earthing resistance, the loop impedance and the residual current circuits. 7. Contact Voltage, Step Voltage, Protecting devices (Fuses, CB /Circuit Breakers/, and RCD /Residual Current Device), numerical. 8. Methods of measurements of soil resistivity. 9. International rules and standards (IEC 60364-4, IEC 60034-5) 10. Protection against electric shock by using low voltage (IEC 60364-4: ELV, SELV, PELV and FELV), Auto Transformer. 11. IP code (IEC 60034-5) 12. Protecting methods against electric shock by using barriers, Isolating Transformer, double insulated appliances and Equipotential Bonding. 13. General review |
| PRACTICE | * Numerical problems   *.* |
| laboratory practice |  |

### **DETAILED SYLLABUS AND COURSE SCHEDULE**

### *academic holidays included*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LECTURE | | | | |
| week | **Topic** | **Compulsory reading; page number**  **(from … to …)** | **Required tasks (assignments, tests, etc.)** | **Completion date, due date** |
| 1. | … | … | … | … |
| 2. |  |  |  |  |
| 3. |  |  |  |  |
| 4. |  |  |  |  |
| 5. |  |  |  |  |
| 6. |  |  |  |  |
| 7. |  |  |  |  |
| 8. |  |  |  |  |
| 9. |  |  |  |  |
| 10. |  |  |  |  |
| 11. |  |  |  |  |
| 12. |  |  |  |  |
| 13. |  |  |  |  |
| 14. |  |  |  |  |
| 15. |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PRACTICE, LABORATORY PRACTICE | | | | |
| week | **Topic** | **Compulsory reading; page number**  **(from … to …)** | **Required tasks (assignments, tests, etc.)** | **Completion date, due date** |
| 1. | … |  |  |  |
| 2. |  |  |  |  |
| 3. |  |  |  |  |
| 4. |  |  |  |  |
| 5. |  |  |  |  |
| 6. |  |  |  |  |
| 7. |  |  |  |  |
| 8. |  |  |  |  |
| 9. |  |  |  |  |
| 10. |  |  |  |  |
| 11. |  |  |  |  |
| 12. |  |  |  |  |
| 13. |  |  |  |  |
| 14. |  |  |  |  |
| 15. |  |  |  |  |

## **assessment and evaluation**

*(Neptun: Instruction/Subjects/Subject Details/Syllabus/Examination and Evaluation System)*

##### **Attendance**

*In accordance with the Code of Studies and Examinations of the University of Pécs, Article 45 (2) and Annex 9. (Article 3) a student may be refused a grade or qualification in the given full-time course if the number of class absences exceeds 30% of the contact hours stipulated in the course description.*

Attending is required all classes and its control takes place occasionally at presentations and at every practical and laboratory classes. Presentations and practical classes cannot be made up, laboratory classes can be made up once at an extra date agreed with the laboratory lecturer. In case of absence the student must present a valid excuse, such as a doctor's note.

***Method for monitoring attendance****(e.g.: attendance sheet / online test/ register, etc.)*

Attendance sheet

##### **assessment**

*Cells of the appropriate type of requirement is to be filled out (course-units resulting in mid-term grade or examination). Cells of the other type can be deleted.*

Course resulting in mid-term grade(PTE TVSz 40§(3))

**Mid-term assessments, performance evaluation and their ratio in the final grade**(The samples in the table to be deleted.)

|  |  |  |
| --- | --- | --- |
| **Type** | **Assessment** | **Ratio in the final grade** |
| Test 1 (DC machines) | Max. 50 points | 20 % |
| Test 2 (Electrical drives) | Max. 50 points | 20 % |
| Test 3 (Electrical drives) | Max. 50 points | 20 % |

**Opportunity and procedure for re-takes**(PTE TVSz 47§(4))

*The specific regulations for improving grades and resitting testsmust be read and applied according to the general Code of Studies and Examinations. E.g.: all tests and assessment tasks can be repeated/improved at least once every semester, and the tests and home assignments can be repeated/improved at least once in the first two weeks of the examination period.*

Possibility

Re-take possibility twice in the last week of the study period and in the first two weeks of the exam period.

**Grade calculation as a percentage**

based on the aggregate performance according to the following table

|  |  |
| --- | --- |
| **Course grade** | **Performance in %** |
| excellent (5) | 85 % … |
| good (4) | 70 % ... 85 % |
| satisfactory (3) | 55 % ... 70 % |
| pass (2) | 40 % ... 55 % |
| fail (1) | below 40 % |

The lower limit given at each grade belongs to that grade.

Course-unitwithfinal examination

**Mid-term assessments, performance evaluation and their weightingas a pre-requisite for taking the final exam**

(The samples in the table to be deleted.)

|  |  |  |
| --- | --- | --- |
| Type | Assessment | Weighting as a proportion of the pre-requisite for taking the exam |
| 1. *e.g..: Test 1* | *eg. max 20 points* | *eg. 20 %* |
| 1. *e.g.: Test 2* | *eg. max 30 points* | *eg. 30 %* |
| 1. *e.g.: home assignment (project documentation)* | *eg. max 30 points* | *eg. 30 %* |
| 1. *…* | *eg. max 15 points* | *eg. 20 %* |

**Requirements for the end-of-semester signature**

(Eg.: mid-term assessment of 40%)

…

**Re-takes for the end-of-semester signature** (PTE TVSz 50§(2))

*The specific regulations for grade betterment and re-take must be read and applied according to the general Code of Studies and Examinations. E.g.: all the tests and the records to be submitted can be repeated/improved each at least once every semester, and the tests and home assignments can be repeated/improved at least once in the first two weeks of the examination period.*

…

***Type of examination*** *(written, oral): ……Written……………………….*

***The exam is successful if the result is minimum 40 %.*** *(The minimum cannot exceed 40%.)*

**Calculation of the grade**(TVSz 47§ (3))

The mid-term performance accounts for  ***…*** %, the performance at the exam accounts for ***…*** % in the calculation of the final grade.

**Calculation of the final grade based on aggregate performance in percentage.**

|  |  |
| --- | --- |
| **Course grade** | **Performance in %** |
| excellent (5) | 85 % … |
| good (4) | 70 % ... 85 % |
| satisfactory (3) | 55 % ... 70 % |
| pass (2) | 40 % ... 55 % |
| fail (1) | below 40 % |

The lower limit given at each grade belongs to that grade.

## **Specified literature**

*In order of relevance. (In Neptun ES: Instruction/Subject/Subject details/Syllabus/Literature)*

##### **compulsory reading and availability**

* Electric Motors and Drives Fundamentals, A. Hughes, Heinemann Newnes

##### **recommended literature and availability**

* Electric drives: Concepts and Applications, V. Subrahmanyam, McGraw-Hill