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

# course syllabus and course requirements 2022/2023 I.

|  |  |
| --- | --- |
| Course title | Design and Production Technology |
| **Course Code** | **IVB274AN** |
| **Hours/Week: le/pr/lab** | **2/0/1** |
| **Credits** | **4** |
| **Degree Programme** | **Electrical Engineering BSc 5. s.** |
| **Study Mode** | **living education** |
| **Requirements** | **midsemester grade** |
| **Teaching Period** | **autumn** |
| **Prerequisites** | **-** |
| **Department(s)**  **Course Director** | **Department of Automation**  **Dr. Viktor Bagdán** |
| **Teaching Staff** |  |
|  |  |

# course description

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

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

Acquiring advanced technical knowledge essential to the 21st century to the work of an engineer who wants to be knowledgeable and creative in the world of State of The Art technology.

# syllabus

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

## **goals and objectives**

*Goals, student learning outcome.*

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

Short description:

Knowledge of the basics and methods of manufacturing technology. Insight into small series and mass production manufacturing processes and design methods. Independent design task.

## **course content**

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

|  |  |
| --- | --- |
|  | TOPICS |
| LECTURE | *1. Introduction*  *2. Task specifications and list of requirements*  *3. Component basics, through-hole components and surface-mount parts, enclosures*  *4. Processes and principles of design and development*  *5. Failure mode and effects analysis (FMEA), flowchart (FC), control plan (CP)*  *6. Manufacturing documentation*  *7. PCB design software*  *8. The aspects of prototype making*  *9. Production under mass production conditions, state-of-the-art production lines*  *10. The aspects of product development and manufacturing efficiency, Lean*  *11. Environmental considerations, lead-free soldering, RoHS*  *12. References, Recommended Literature*  ***13. Factory tour (HARMAN Professional Kft.)*** |
| PRACTICE | 1. *topic* 2. *topic* 3. *topic* 4. *etc.* |
| laboratory practice | 1. *EAGLE PCB design software* 2. *Independent design task* |

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

### *academic holidays included*

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| --- | --- | --- | --- | --- |
| LECTURE | | | | |
| week | **Topic** | **Compulsory reading; page number**  **(from … to …)** | **Required tasks (assignments, tests, etc.)** | **Completion date, due date** |
| 1. | Course description, introduction, requirements for the subject | [1], 1-4 | learn | 2nd week |
| 2. | Task specifications and list of requirements, Component basics | [1], 5-13 | learn | 3rd week |
| 3. | Component basics, through-hole components | [1], 14-25 | learn | 4th week |
| 4. | Component basics, surface-mount parts, enclosures | [1], 26-51 | learn | 5th week |
| 5. | Processes and principles of design and development | [1], 52-62 | learn | 7th week |
| 6. | Factory tour (HARMAN Professional Kft.) |  | participate |  |
| 7. | First midterm test |  |  |  |
| 8. | Failure mode and effects analysis (FMEA), flowchart (FC), control plan (CP) | [1], 63-67 | learn | 9th week |
| 9. | Manufacturing documentation | [1], 68-76 | learn | 10th week |
| 10. | PCB design software | [1], 77-84 | learn | 11th week |
| 11. | The aspects of prototype making | [1], 85-90 | learn | 12th week |
| 12. | Production under mass production conditions, state-of-the-art production lines | [1], 91-103 | learn | 13th week |
| 13. | The aspects of product development and manufacturing efficiency, Lean  Environmental considerations, lead-free soldering, RoHS | [1], 104-112 | learn | 14th week |
| 14. | Second midterm test |  |  |  |
| 15. | Retake of midterm tests |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PRACTICE, LABORATORY PRACTICE | | | | |
| week | **Topic** | **Compulsory reading; page number**  **(from … to …)** | **Required tasks (assignments, tests, etc.)** | **Completion date, due date** |
| 1. |  |  |  |  |
| 2. | EAGLE PCB design software | [2], 1-4 | learn, complete tasks in EAGLE | 3rd week |
| 3. | EAGLE PCB design software | [2], 5-7 | learn, complete tasks in EAGLE | 4th week |
| 4. | EAGLE PCB design software | [2], 8-11 | learn, complete tasks in EAGLE | 5th week |
| 5. | EAGLE PCB design software | [2], 12-16 | learn, complete tasks in EAGLE | 6th week |
| 6. | EAGLE PCB design software | [2], 17-22 | learn, complete tasks in EAGLE | 7th week |
| 7. | EAGLE PCB design software | [2], 23-26 | learn, complete tasks in EAGLE | 8th week |
| 8. | EAGLE PCB design software | [2], 27-30 | learn, complete tasks in EAGLE | 9th week |
| 9. | EAGLE PCB design software | [2], 31-32 | learn, complete tasks in EAGLE | 10th week |
| 10. | EAGLE PCB design software | [2], 33 | learn, complete tasks in EAGLE | 11th week |
| 11. | EAGLE PCB design software | [2], 34 | learn, complete tasks in EAGLE | 12th week |
| 12. | Independent design task |  |  |  |
| 13. | Independent design task |  |  |  |
| 14. | Independent design task |  |  |  |
| 15. | Submission of independent design task |  |  |  |

## **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.*

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

attendance sheet (Excel)

##### **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** |
| *midterm Test 1* | *max 100 pont* | *33,3 %* |
| *midterm Test 2* | *max 100 pont* | *33,3 %* |
| *home assignment (project documentation)* | *max 100 pont* | *33,3 %* |
| *…* |  |  |

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

*The specific regulations for improving grades and resitting tests must 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.*

Opportunity for retakes: 8th week (first tests), 15th week (second tests)

**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.

## **Specified literature**

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

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

[1.] Viktor Bagdán - Design and Production Aspects of Electronic Products

[2.] Tervezes\_es\_gartas\_gyak\_eagle\_manual.pdf

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

[3.] Dr. Wersényi György – Híradástechnikai alkatrészek, Győr, 2004, Széchenyi István Egyetem, Távközlési Tanszék

[4.] Dr. Kardos Károly, Jósvai János - Gyártási folyamatok tervezése, 2006. március 28.

[5.] A termék életciklusa. /Kempelen Farkas Digitális Tankönyvtár/

[6.] Tersztyánszky László - Ólommentes forrasztás, Budapesti Műszaki és Gazdaságtudományi Egyetem, Elektronikai Technológia Tanszék (BME-ETT)