**General Information:**

**Name of Course: Intelligent Systems 1**

**Course Code:** PMTMINB315HA

**Semester: 5th**

**Number of Credits:** 3

**Allotment of Hours per Week: 2** lectures

**Evaluation:** Based on midterm exams (with grade)

**Prerequisites: PMTMINB210HA**

**Instructors: Dr Miklós GERZSON, associate professor**

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**Introduction, Learning Outcomes**

The course is intend for undergraduate students in the Bachelor of Engineering Information Technologist Program.

After successful completion of the course students will be enlightened upon the main concepts of system theory and the control theory based on the state space representation of the systems. These skills will help them to make their future work better in the field of control engineering.

**General Course Description and Main Content:**

Brief Syllabus:

* basics of modelling
* Kalman’s system model
* description of systems based on the state space and input - output representation
* stability concepts and investigation methods
* observability, controllability
* introduction to the formal languages, grammars, automata

**Methodology:**

Demonstration of theoretical background in lectures and common solving of tasks on exercises.

**Schedule:**

Study period in 15 weeks: September 3 - December 14 (2018)

1. Introduction, basic requirements
2. Basics of modelling
3. Kalman’s system representation
4. System classes, Input – output models
5. Basic concepts of stability
6. The most important stability investigation methods.
7. Root locus method
8. State space representation: basic forms, solvability, relation with I/O models
9. State space representation: observability, controllability, stability
10. National holiday
11. Midterm test 1
12. Introduction to formal languages, grammars
13. Different types of automata
14. Turing machines
15. Midterm test 2

**Attendance:**

Attending is required all classes, and may impact the grade (only positively). In case of unexcused absences from more than 30% of the total number of lesson will be grounds for failing the class. To be in class at the beginning time and stay until the scheduled end of the lesson is required, tardiness of more than 20 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

**Evaluation + Grading**

Grading is based the results of the midterm exams.

**Grading scale**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Numeric Grade: | 5 | 4 | 3 | 2 | 1 |
| Evaluation in points: | 85%-100% | 70%-85% | 55%-70% | 40%-55% | 0-40% |

**Students with special needs:**

Students with special physical needs and requiring special assistance must first register with the Dean of the Students Office. All reasonable requests to provide an equal learning environment for all students is to be assured.

**Required Reading and other Materials will be equivalent to:**

* Lecture notes, examples, exercises in the Neptun MeetSreet
* Schwarzenbach J, and Gill K.F.: System Modelling and Control, Edward Arnold, 1992
* Aström K.J and Wittenmark B.: Computer-Controlled Systems, Prentice-Hall 1990
* Kuo B.C. Automatic Control Systems, Prentice Hall, 1991