## UNIVERSITY OF EAST SARAJEVO
## FACULTY OF MECHANICAL ENGINEERING
## EAST SARAJEVO

| Study program / module | MECHANICAL ENGINEERING/ PRODUCTION ENGINEERING |
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| Course title | Digital systems | | | |
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| **Course code** | **Course status** | **Semester** | **Fund of classes** | **ECTS points** |
| МАФ12МC2007.326,0320 | Elective | II | 3+2 | 6 |
| **Teachers** | PhD Saša Prodanović, assistant professor | | | |

| Conditionality by other courses: | The form of conditionality |
|---|---|
| No conditioning | ------------- |

**Course aims:**

Introduction and learning various kinds of logic circuits and methods for their analysis and design, in the production engineering.

**Learning outcomes (acquired knowledge):**

Acquiring knowledge about digital automatic control systems within the manufacturing plants. Application of methods for analysis and design of logic circuits. Mastering the settings of programmable logic controllers (PLC) with a focus on controled objects in the field of production engineering.

**Course content:**

Course structure. Logic functions: definition, logic diagrams, minimization. Combinational logic circuits: definition, analysis and design of arithmetic logic circuits, examples. Combinational logic circuits with integrated logic circuits: design; adders; value comparator; decoder and demultiplexer; encoder and multiplexer; ROM and programmable logic matrix. Synchronous sequential logic circuits: concept, flip flops, analysis and synthesis. Asynchronous sequential logic circuits: analysis and synthesis. Registers, counters and memories. A/D and D/A converters. Programmable logic controllers: structure, tuning and application in production systems.

**Teaching methods:**

Teaching is done interactively through lectures, auditory and practical exercises and through consultation. The lectures present the theoretical part of the material, illustrated with typical examples. The acquired knowledge through auditory and practical exercises, is applied to solve a specific task. The exam grade is formed on the basis of: attendance at lectures and exercises, successfully completed and defended project assignment, success at colloquiums and final exam.

**Literature:**

Basic Literature
[1]  З. Бучевац, Дигитални системи, Ауторизована предавања
[2]  З. Бучевац, Практикум за лабораторијске вежбе из Дискретних дигиталних система аутоматског управљања, Фондација "Универзитет будућности", Мрљеш д.о.о, Београд 2000.
[3]  M. Morris Mano, Digital Design, Prentice-Hall, New Jersey, 1984.
Additional literature
[1]  A. D. Friedman, Fundamentals of logic design and switching, Computer Science Press Inc., Rockville, Maryland, 1986.
[2]  A. Paul Malvino, D. P. Leach, Digital principles and applications, McGraw-Hill, New York, 1975.

**Type of student evaluation:**

To pass exam it is required at least 50% of each of the following activities:

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| Attending classes | 5 | Colloquium 1 | 20 |
| Attending exercises | 5 | Colloquium 2 | 20 |
| Project assignment | 20 | Final exam | 30 |

**Special designation for the course:**

**Name and surname of the teacher who prepared the information**: PhD Saša Prodanović, assistant professor