# SYLLABUS

## 1. Course title:

Machine vision

## 2. Code:

## 3. Cycle of study:

I

## 4. ECTS credits:

3

## 5. Type of course:

Elective

## 6. Prerequisites:

## 7. Class restrictions:

None

## 8. Duration / semester(s):

1 | VIII

## 9. Weekly contact hours and student workload:

| | Semester (1) | Semester (2) | (for two-semester courses) | Workload: (hours) |
|---|---|---|---|---|
| | I | | | |
| 9.1. Lectures | 2 | | Classes: | 22,50 |
| 9.2. Seminars | 0 | | Individual work: | 62,63 |
| 9.3. Laboratory / Practice classes | 0 | | In total: | 85,13 |

## 10. Faculty:

Faculty of Mechanical Engineering

## 11. Department/study program:

Production engineering

## 12. Lecturer:

PhD Mirza Bećirović, assistant professor

## 13. Course aims:

Acquiring theoretical and practical knowledge in the field of machine vision and its applications.

## 14. Learning outcomes:

**At the end of the semester, successful students, who have continuously performed their duties throughout the entire teaching period, will be able to: independently design, develop, implement and use modern machine vision systems in various areas of practical application.**

## 15. Course content:

**1. Introduction to machine vision;**
**2. Fundamentals of digital image processing;**
**3. Properties of light, two-dimensional signals and systems;**
**4. Digital image formation;**
**5. Image transformation;**
**6. Image quality improvement;**
**7. Image restoration;**
**8. First test;**
**9. Image compression;**
**10. Edge extraction;**
**11. Texture description;**
**12. Image segmentation;**
**13. Binary image operations;**
**14. Color image processing;**
**15. Second test;;**

## 16. Learning methods:

**- Lectures – theoretical lectures, active two-way communication between student and professor, mandatory student attendance;**
**- Written (from the theoretical part and tasks);**
**- Seminar/graphic works – independent work of the student on solving the problem set;**
**- Consultations – clarification of any ambiguities related to the topic**

## 17. Assessment methods:

**Defense of seminar/graphic works – the student defends his/her work before the professor/assistant – answers the questions asked;**
**- Written (from the theoretical part and assignments) – the student solves the questions/assignments set in a given period of time related to the topic of study;**
**- Final exam – oral answer to the questions asked by the professor;**
**- Make-up exam (written) – solving the questions/assignments set in a given period of time related to the topic of study;**
**- Make-up exam (oral) – oral answer to the questions asked.**

**Grading system: (20)+(20)+(40)+(20)=(100) points**

| Grade | described | by letter | points |
|---|---|---|---|
| 5 (five) | Does not meet minimum criteria | F;FX | <54 |
| 6 (six) | meets the minimum criteria | E | 54 -64 |
| 7 (seven) | Generally good, but with significant flaws | D | 65-74 |
| 8 (eight) | Average, with noticeable errors | C | 75-84 |
| 9 (nine) | Above average, with some errors | B | 85-94 |
| 10 (ten) | Exceptional success without mistakes or with minor mistakes | A | 95-100 |

## 18. Assessment components:

**Grading will be based on the following activities:**
**- Attendance at classes = 0 points.**
**- Seminar/Graphic work = 20 points.**
**- Test tasks (2x10) = 20 points.**
**- Theory tests (2x20) = 40 points.**
**- Pre-exam obligations = 80 points.**
**- Final exam = 20 points.**
**- Total = 100 points.**

**When solving the obligations related to knowledge testing, the student must earn more than 50% of the maximum number of points prescribed for a given activity. If the student does not earn the required number of points from a certain form of knowledge testing, he/she will take a make-up exam from the given segment of knowledge testing.**

## 19. Mandatory reading list:

**1. Oge Marques, Gustavo Benvenutti Borba - Image Processing Recipes in MATLAB , 2024, CRC Pressr;**
**2. Miodrag V. Popović: Digitalna obrada slike, 2006;**

## 20. Additional reading list:

**1. Solomon, C., & Breckon, T. (2011). Fundamentals of Digital Image Processing.Press,;**

## 21. Web sources:

## 22. Applicable from the academic year:

**2025/2026**

## 23. Adopted in the Faculty/Academy session: