



## RTU Course "Industrial Engineering"

15513 Aparātu būvniecības katedra

### General data

|   |   |
|---|---|
| Code  | MAB700  |
| Course title  | Industrial Engineering  |
| Course status in the programme  | Compulsory/Courses of Limited Choice; Courses of Free Choice  |
| Course level  | Post-graduate Studies   |
| Course type   | Academic  |
| Field of study  | Mechanics, Mechanical Engineering, Machine Building   |
| Responsible instructor  | Juris Krizbergs   |
| Volume of the course: parts and credits points                        | 1 part, 2.0 Credit Points, 3.0 ECTS credits   |
| Language of instruction   | LV, EN  |
| Possibility of distance learning                                      | Not planned   |
| Maximum auditorium capacity   | 25  |
| Maximum number of students per semester                               | 25  |
| Abstract  | Manufacturing management processes and their optimization methods and technics. Manufacturing optimization principles using Lean, Six Sigma, etc. Application of means for improvement of manufacturing productivity (CAD/CAM/CAE).   |
| Goals and objectives of the course in terms of competences and skills | Aim of the course is to prepare students for work as supervisors of manufacturing in enterprises specialising in mechanical engineering and metal processing. Achievement of student ability to investigate and analyse the processes of manufacturing and to give proposals for possible optimisation.   |
| Structure and tasks of independent studies                            | Review of literature. Group work to analyse case studies.   |
| Recommended literature  | 1. L.Bunga,A.Jonāns Aparātbūves un mašīnbūves tehnoloģijas pamati.Rīga ,Zvaigzne,1978.,340 lpp.<br>2. George Thusty. Manufacturing Processes and Equipment. Prentice-Hall, Inc., 2000. 928 p.<br>3. Frank Kreith. Mechanical Engineering Handbook. CRC Press LLC, 1999.<br>4. John M. Gross, Kenneth R. McInnis. Kanban Made Simple: Demystifying and Applying Toyota' s Legendary Manufacturing Process. Amacom, 2003. 259 p.<br>5. Briefcase Books - Six Sigma Managers. MCGraw-Hill. 20 p. |
| Course prerequisites  | It is necessary to have knowledge in technology of building machines and apparatus, metal cutting machines, auxiliary devices and cutting tools.  |

### Course outline

| Theme  | Hours |
|--|-------|
| Basics of Lean manufacturing                           | 4     |
| Methods of manufacturing optimization                  | 4     |
| Reduction and/or elimination of waste in manufacturing | 2     |
| Basics of quality control (ISO9000)                    | 4     |
| Ergonomics   | 2     |
| Computer Aided Engineering (CAD)                       | 4     |
| Computer Aided Manufacturing (CAM)                     | 4     |
| Computer Aided Engineering (CAE)                       | 2     |
| Case study "Optimization of manufacturing"             | 4     |
| Innovation management                                  | 2     |

### Learning outcomes and assessment

| Learning outcomes   | Assessment methods    |
|---|-----------------------|
| Able to analyse manufacturing organization rules                          | Exam                  |
| Able to prepare manufacturing process for units of machines and apparatus | Laboratory work, exam |
| Fluent in methods of manufacturing optimization                           | Exam                  |
| Able to recognize and eliminate manufacturing waste                       | Laboratory work, exam |

### Study subject structure

| Part | CP  | ECTS | Hours per Week |           |      | Tests |      |      | Tests (free choice) |      |      |
|------|-----|------|----------------|-----------|------|-------|------|------|---------------------|------|------|
|      |     |      | Lectures       | Practical | Lab. | Test  | Exam | Work | Test                | Exam | Work |
| 1.   | 2.0 | 3.0  | 2.0            | 0.0       | 0.0  |       | *    |      |                     |      |      |