| Course Description Form | |
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| **Course Code and Name** | ME305 Mechanisms |
| **Course Semester** | 5 |
| **Catalog Content** | Introduction to mechanisms; examples, fundamental definitions, degree of freedom, joint restrictions, classification of mechanisms. Kinematic analysis of planar mechanisms: position, velocity and acceleration analysis using graphical and analytical methods. Linear mechanical systems; simple gear trains, planetary gear trains. Cam mechanisms. |
| **Textbook** | Theory of machines and Mechanism, J.E. Shigley and J.J. Uicker, Mc-Graw Hill Comp., England. |
| **Supplementary Textbooks** | 1. Mechanisms, E. Söylemez, METU Publication No:64 1999 Ankara<br>2. Mechanism Design, A.G Erdman.,G.N. Sandor, Prentice Hall 1997 |
| **Credit** | 5 |
| **Prerequisites of the Course ( Attendance Requirements)** | |
| **Type of the Course** | Compulsory |
| **Instruction Language** | English |
| **Course Objectives** | Learning the methods used for the kinematic analysis of mechanisms and linear mechanical systems.<br>Learning the basics of cam mechanisms |
| **Course Learning Outcomes** | 1) Can understand the concept of degrees of freedom.<br>2) Can apply position analysis to linear mechanisms.<br>3) Can apply speed analysis to linear mechanisms.<br>4) Can apply acceleration analysis to linear mechanisms.<br>5) Can apply kinematic analysis to gear trains. |
| **Instruction Methods** | The delivery mode of this course is face-to-face |
| **Weekly Schedule** | 1. Week Introduction to mechanisms: Basic concepts, joints and link types.<br>2. Week Introduction to mechanisms: Degrees of freedom, Grubler's Equation, classification of mechanisms.<br>3. Week Position analysis: Graphical methods.<br>4. Week Position analysis: Loop closure equations.<br>5. Week Velocity analysis: Graphical and analytical methods.<br>6. Week Velocity analysis: Graphical and analytical methods.<br>7. Week Velocity analysis: Instantaneous centers.<br>8. Week Acceleration analysis: Graphical and analytical methods<br>9. Week Acceleration analysis: Graphical and analytical methods<br>10. Week Acceleration analysis: Graphical and analytical methods<br>11. Week Position, velocity and acceleration analysis by means of complex numbers.<br>12. Week Simple and Phanetary Gear trains.<br>13. Week Simple and Phanetary Gear trains.<br>14. Week Introduction to cam mechanisms<br>15. Week Final Exam |
| **Teaching and Learning Methods**<br><br>*(These are examples. Please fill which activities you use in the course)* | Weekly theoretical course hours:3<br>Weekly applied course hours:0<br>Reading Activities:3<br>Internet browsing, library work:3<br>Designing and implementing materials:2<br>Report preparing<br>Preparing a Presentation |

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| | Presentations<br>Preparation of Midterm and Midterm Exam:4<br>Final Exam and Preparation for Final Exam:7 |

**Assessment Criteria**

| | Numbers | Total Weighting (%) |
|---|---|---|
| Midterm Exams | 2 | 60 |
| Assignment | | |
| Application | | |
| Projects | | |
| Practice | | |
| Quiz | | |
| Percent of In-term Studies (%) | | 60 |
| Percentage of Final Exam to Total Score (%) | 1 | 40 |
| Attendance | | |

**Workload**

| Activity | Total Number of Weeks | Duration (weekly hour) | Total Period Work Load |
|---|---|---|---|
| Weekly Theoretical Course Hours | 14 | 3 | 42 |
| Weekly Tutorial Hours | | | |
| Reading Tasks | 7 | 3 | 21 |
| Studies | 6 | 3 | 18 |
| Material Design and Implementation | 1 | 2 | 2 |
| Report Preparing | | | |
| Preparing a Presentation | | | |
| Presentations | | | |
| Midterm Exam and Preperation for Midterm Exam | 6 | 4 | 24 |
| Final Exam and Preperation for Final Exam | 2 | 7 | 14 |
| Other ( should be emphasized) | 2 | 2 | 4 |
| Total Workload | | | 125 |
| Total Workload / 25 | | | 5,0 |
| Course Credit (ECTS) | | | 5 |

**Contribution Level Between Course Learning Outcomes and Program Outcomes**

| No | Program Outcomes | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 1 | Adequate knowledge of subjects specific to mathematics, natural sciences and related engineering disciplines; ability to use theoretical and applied knowledge related to these areas in complex engineering problems. | | | | X | |
| 2 | Ability to identify, define, formulate, and solve complex engineering problems; ability to select and apply appropriate analysis and modeling methods to this end. | | | | X | |
| 3 | Ability to design a complex | | | | X | |

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| | system, process, device or product under realistic constraints and conditions to meet specific requirements; ability to apply modern design methods for this purpose. | | | | | | |
| 4 | Ability to develop, select and use modern techniques and tools required for the analysis and solution of complex problems encountered in engineering practice; ability to use information technologies effectively. | | X | | | | |
| 5 | Ability to design and conduct experiments, collect data, analyze and interpret results to investigate complex engineering problems or discipline-specific research topics. | | | | | | |
| 6 | Ability to work effectively in disciplinary and multi-disciplinary teams; ability to work individually. | | | | | | |
| 7 | Ability to communicate effectively in Turkish, both orally and in writing; knowledge of at least one foreign language; the ability to write effective reports and understand written reports, to prepare design and production reports, to deliver effective presentations, to give and receive clear and understandable instructions. | | | | | | |
| 8 | Awareness of the necessity of lifelong learning; the ability to access information, to follow developments in science and technology, and to renew oneself constantly. | | | | | | |
| 9 | Acting in accordance with ethical principles, professional and ethical responsibility; information about standards used in engineering applications. | | | | | | |
| 10 | Information about business life practices such as project management, risk management and change management; awareness of entrepreneurship, innovation; information about sustainable development. | | | | | | |
| 11 | Knowledge about the universal and social effects of engineering applications on health, environment and safety and the problems of the age reflected in the engineering field; awareness of the legal consequences of engineering solutions. | | | | | | |

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| **The Course's Lecturer(s) and Contact Informations** | 1. Doç.Dr. Tuncay KARAÇAY<br>karacay@gazi.edu.tr<br>2. Prof.Dr. Mehmet EROĞLU<br>Meroglu58@gmail.com<br>3. Prof.Dr. Ömer KELEŞ<br>keles@gmail.com @gazi.edu.tr |