**FACULTY OF ENGINEERING, ARCHITECTURE AND DESIGN**

**COMPUTER ENGINEERING**

**CURRICULUM**

**1. SEMESTER**

| C.Code | Course Name | Type | T | A | L | C | ECTS |
|---|---|---|---|---|---|---|---|
| CENG 101 | Algorithms and Programming I | C | 2 | 0 | 2 | 3 | 6 |
| CENG 103 | Introduction to Computer Engineering | C | 3 | 0 | 0 | 3 | 6 |
| MATH 121 | Calculus I | C | 4 | 0 | 0 | 4 | 6 |
| PHYS 101 | Physics | C | 3 | 0 | 2 | 4 | 6 |
| ENG 101 | English for Academic Purposes I | C | 3 | 0 | 0 | 3 | 3 |
| ATA 101 | Ataturk's Principles and History of Revolutions I | C | 2 | 0 | 0 | 2 | 2 |
| TRD 101 | Turkish Language I | C | 2 | 0 | 0 | 2 | 2 |
| CAP 002 | Career Planning and meeting with the sector | C | 1 | 0 | 0 | 1 | 2 |
| | | | **19** | **0** | **4** | **21** | **33** |

**2. SEMESTER**

| C.Code | Course Name | Type | T | A | L | C | ECTS |
|---|---|---|---|---|---|---|---|
| CENG 102 | Algorithms and Programming II | C | 2 | 0 | 2 | 3 | 6 |
| CENG 106 | Introduction to Artificial Intelligence | C | 2 | 0 | 2 | 3 | 6 |
| MATH 122 | Calculus II | C | 4 | 0 | 0 | 4 | 6 |
| MATH 124 | Linear Algebra | C | 3 | 0 | 0 | 3 | 5 |
| ENG 102 | English for Academic Purposes II | C | 3 | 0 | 0 | 3 | 3 |
| ATA 102 | Ataturk's Principles and History of Revolutions II | C | 2 | 0 | 0 | 2 | 2 |
| TRD 102 | Turkish Language II | C | 2 | 0 | 0 | 2 | 2 |
| | | | | | | | |
| | **TOTAL** | | **18** | **0** | **4** | **20** | **30** |

**3. SEMESTER**

| C.Code | Course Name | Type | T | A | L | C | ECTS |
|---|---|---|---|---|---|---|---|
| CENG 201 | Data Structures | C | 3 | 0 | 2 | 4 | 5 |
| CENG 203 | Object Oriented Programming | C | 3 | 0 | 2 | 4 | 5 |
| CENG 207 | Discrete Mathematics | C | 3 | 0 | 0 | 3 | 5 |
| MATH 225 | Probability and Statistics | C | 3 | 0 | 0 | 3 | 5 |
| OHS 201 | Occupational Health and Safety I | C | 2 | 0 | 0 | 2 | 2 |
| | Departmental Elective | E | 3 | 0 | 0 | 3 | 5 |
| | University Elective | E | 2 | 0 | 0 | 2 | 3 |
| | | | | | | | |
| | **TOTAL** | | **19** | **0** | **4** | **21** | **30** |

**4. SEMESTER**

| C.Code | Course Name | Type | T | A | L | C | ECTS |
|---|---|---|---|---|---|---|---|
| CENG 202 | Operating Systems | C | 3 | 0 | 0 | 3 | 5 |
| CENG 204 | Programming Languages | C | 3 | 0 | 2 | 4 | 5 |
| CENG 208 | Machine Learning | C | 3 | 0 | 0 | 3 | 5 |
| MATH 222 | Numerical Analysis | C | 3 | 0 | 0 | 3 | 5 |
| OHS 202 | Occupational Health and Safety II | C | 2 | 0 | 0 | 2 | 2 |
| EEE 208 | Digital Electronics | C | 3 | 0 | 2 | 4 | 5 |
| CENG 200 | Practicum | C | 0 | 0 | 0 | 0 | 5 |
| | | | | | | | |
| | **TOTAL** | | **17** | **0** | **4** | **19** | **32** |

**5. SEMESTER**

| C.Code | Course Name | Type | T | A | L | C | ECTS |
|---|---|---|---|---|---|---|---|
| CENG 303 | Computer Architecture | C | 3 | 0 | 0 | 3 | 6 |
| CENG 305 | Database Management | C | 3 | 0 | 0 | 3 | 6 |
| CENG 307 | Computer Networks | C | 3 | 0 | 0 | 3 | **6** |
| | Departmental Elective | E | 3 | 0 | 0 | 3 | 5 |
| | Departmental/Non-departmental Elective | E | 3 | 0 | 0 | 3 | 5 |
| | | | | | | | |
| | **TOTAL** | | **15** | **0** | **0** | **15** | **28** |

**6. SEMESTER**

| C.Code | Course Name | Type | T | A | L | C | ECTS |
|---|---|---|---|---|---|---|---|
| CENG 302 | System Analysis and Design | C | 3 | 0 | 0 | 3 | **6** |
| CENG 304 | Software Engineering | C | 3 | 0 | 0 | 3 | **6** |
| | Departmental Elective | E | 3 | 0 | 0 | 3 | 5 |
| | Departmental Elective | E | 3 | 0 | 0 | 3 | 5 |
| | Departmental/Non-departmental Elective | E | 3 | 0 | 0 | 3 | 5 |
| | Departmental/Non-departmental Elective | E | 3 | 0 | 0 | 3 | 5 |
| | **TOTAL** | | **18** | **0** | **0** | **18** | **32** |

**7. SEMESTER**

| C.Code | Course Name | Type | T | A | L | C | ECTS |
|---|---|---|---|---|---|---|---|
| | Departmental Elective | E | 3 | 0 | 0 | 3 | 5 |
| | Departmental Elective | E | 3 | 0 | 0 | 3 | 5 |
| | Departmental Elective | E | 3 | 0 | 0 | 3 | 5 |
| | Departmental Elective | E | 3 | 0 | 0 | 3 | 5 |
| | Departmental/Non-departmental Elective | E | 3 | 0 | 0 | 3 | 5 |
| | Departmental/Non-departmental Elective | E | 3 | 0 | 0 | 3 | 5 |
| | **TOTAL** | | **18** | **0** | **0** | **18** | **30** |

**8.SEMESTER**

| C.Code | Course Name | Type | T | A | L | C | ECTS |
|---|---|---|---|---|---|---|---|
| CENG 402 | Graduation Project | C | 2 | 4 | 0 | 4 | 8 |
| | Internship* | C | 0 | 24 | 0 | 12 | 22 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | **TOTAL** | | **2** | **28** | **0** | **16** | **30** |

| | |
|---|---|
| **Practicum:** | Internship is mandatory for graduation. It starts in the summer at the end of the 4th semester at the earliest and has total 5 ECTS. Duration is 30 days. |

***INTERNSHIP APPLIED COURSES**

| C. Code | Course Name | Type | T | U | L | C | AKTS |
|---|---|---|---|---|---|---|---|
| CENG 404 | Vocational Training in Business | Z | 0 | 24 | 0 | 12 | 22 |
| CENG 406 | Computer Engineering Applications | Z | 0 | 24 | 0 | 12 | 22 |

* Alternatively, one of the two courses will be taken

| | |
|---|---|
| ***CREDIT / ECTS TOTAL*** | **245** |
| ***ELECTIVE COURSE CREDIT / ECTS TOTAL*** | **68** |
| ***ELECTIVE COURSE RATIO (%)*** | **27,76** |

**DEPARTMENTAL ELECTIVE COURSES**

| C.Code | Course Name | Type | T | A | L | C | ECTS |
|---|---|---|---|---|---|---|---|
| CENG 350 | Algorithm Design and Analysis | E | 3 | 0 | 0 | 3 | 5 |
| CENG 351 | Computer Graphics | E | 3 | 0 | 0 | 3 | 5 |
| CENG 352 | Java Programming | E | 3 | 0 | 0 | 3 | 5 |
| CENG 353 | Web Application Development | E | 3 | 0 | 0 | 3 | 5 |
| CENG 354 | Quality and Process Management in Information Technology | E | 3 | 0 | 0 | 3 | 5 |
| CENG 355 | Internet of Things (IoT) | E | 3 | 0 | 0 | 3 | 5 |
| CENG 356 | Generative Artificial Intelligence | E | 3 | 0 | 0 | 3 | 5 |
| CENG 357 | Vocational English I | E | 3 | 0 | 0 | 3 | 5 |
| CENG 358 | Vocational English II | E | 3 | 0 | 0 | 3 | 5 |
| MATH 221 | Differential Equations | E | 4 | 0 | 0 | 4 | 6 |
| CENG 450 | Asynchronous Programming | E | 3 | 0 | 0 | 3 | 5 |
| CENG 451 | Information Technologies and the Environment | E | 3 | 0 | 0 | 3 | 5 |
| CENG 452 | Information Technology Governance | E | 3 | 0 | 0 | 3 | 5 |
| CENG 453 | Information Systems and Applications | E | 3 | 0 | 0 | 3 | 5 |
| CENG 454 | Fuzzy Logic | E | 3 | 0 | 0 | 3 | 5 |
| CENG 455 | Cloud Computing | E | 3 | 0 | 0 | 3 | 5 |
| CENG 456 | Natural Language Processing | E | 3 | 0 | 0 | 3 | 5 |
| CENG 457 | Low-Code Programming | E | 3 | 0 | 0 | 3 | 5 |
| CENG 458 | Embedded System Design | E | 3 | 0 | 0 | 3 | 5 |
| CENG 459 | Special Topics in Information Technologies | E | 3 | 0 | 0 | 3 | 5 |
| CENG 460 | Current Programming Languages | E | 3 | 0 | 0 | 3 | 5 |
| CENG 461 | Advanced Network Expertise | E | 3 | 0 | 0 | 3 | 5 |
| CENG 462 | Advanced Programming | E | 3 | 0 | 0 | 3 | 5 |
| CENG 463 | Inovation | E | 3 | 0 | 0 | 3 | 5 |
| CENG 464 | Human-Computer Interaction | E | 3 | 0 | 0 | 3 | 5 |
| CENG 465 | Cryptology | E | 3 | 0 | 0 | 3 | 5 |
| CENG 466 | Quantum Computers | E | 3 | 0 | 0 | 3 | 5 |

| C.Code | Course Name | Type | T | A | L | C | ECTS |
|---|---|---|---|---|---|---|---|
| CENG 467 | Quantum Programming | E | 3 | 0 | 0 | 3 | 5 |
| CENG 468 | Deep Learning | E | 3 | 0 | 0 | 3 | 5 |
| CENG 469 | Network Security | E | 3 | 0 | 0 | 3 | 5 |
| CENG 470 | Image Processing | E | 3 | 0 | 0 | 3 | 5 |
| CENG 471 | Mobile Application Development | E | 3 | 0 | 0 | 3 | 5 |
| CENG 472 | Project Management | E | 3 | 0 | 0 | 3 | 5 |
| CENG 473 | Data Science | E | 3 | 0 | 0 | 3 | 5 |
| CENG 474 | Declarative Programming | E | 3 | 0 | 0 | 3 | 5 |
| CENG 475 | Data Organization and Management | E | 3 | 0 | 0 | 3 | 5 |
| CENG 476 | Formal Languages and Abstract Machines | E | 3 | 0 | 0 | 3 | 5 |
| CENG 477 | Game Programming | E | 3 | 0 | 0 | 3 | 5 |
| CENG 478 | Pattern Recognition | E | 3 | 0 | 0 | 3 | 5 |
| CENG 479 | Parallel and Distributed Systems | E | 3 | 0 | 0 | 3 | 5 |
| CENG 480 | Robotik | S | 3 | 0 | 0 | 3 | 5 |
| CENG 481 | Robotics Programming | E | 3 | 0 | 0 | 3 | 5 |
| CENG 482 | Script Programming | E | 3 | 0 | 0 | 3 | 5 |
| CENG 483 | Cyber Security | E | 3 | 0 | 0 | 3 | 5 |
| CENG 484 | System Programming | E | 3 | 0 | 0 | 3 | 5 |
| CENG 485 | Data Mining | E | 3 | 0 | 0 | 3 | 5 |
| CENG 486 | Database Management Systems | E | 3 | 0 | 0 | 3 | 5 |
| CENG 487 | Artificial Neural Networks | E | 3 | 0 | 0 | 3 | 5 |
| CENG 488 | Artificial Intelligence | E | 3 | 0 | 0 | 3 | 5 |
| CENG 489 | Assistive Technologies | E | 3 | 0 | 0 | 3 | 5 |
| CENG 490 | Software Quality Assurance | E | 3 | 0 | 0 | 3 | 5 |
| CENG 491 | Software and Hardware Design | E | 3 | 0 | 0 | 3 | 5 |
| CENG 492 | Next Generation Programming | E | 3 | 0 | 0 | 3 | 5 |
| CENG 493 | Green Information Technologies | E | 3 | 0 | 0 | 3 | 5 |