# DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGY
# COURSE SYLLABUS

| Course Details | | | | |
|---|---|---|---|---|
| **Code** | | **Academic Year** | | **Semester** |
| MAT204 | | 2 | | 4 |
| **Title** | | **T** | **A** | **L** | **ECTS** |
| Statistical Methods of Data Analysis | | 2 | 2 | 1 | 6 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Language** | German | | | | | |
| **Level** | **Undergraduate** | **X** | **Graduate** | | **Postgraduate** | |
| **Department / Program** | Energy Science and Technology | | | | | |
| **Forms of Teaching and Learning** | Face-to-face | | | | | |
| **Course Type** | **Compulsory** | | **Elective** | **X** | | |
| **Objectives** | Introduction to probability and statistics | | | | | |
| **Content** | Fundamentals of probability, discrete and continuous random variables, multivariate random variables, basics of descriptive statistics, inductive statistics, point estimation, confidence intervals, hypothesis tests, pairwise tests, analysis of variance, regression analysis, compatibility tests, non-parametric tests. | | | | | |
| **Prerequisites** | None | | | | | |
| **Coordinator** | | | | | | |
| **Lecturer(s)** | Asst.prof. dr. Esra Ataç Baş | | | | | |
| **Assistant(s)** | | | | | | |
| **Work Placement** | None | | | | | |

| Recommended or Required Reading | |
|---|---|
| **Books / Lecture Notes** | |
| **Other Sources** | |

| Additional Course Material | |
|---|---|
| **Documents** | |
| **Assignments** | |
| **Exams** | |

| Course Composition | | |
|---|---|---|
| **Mathematics und Basic Sciences** | 70 | % |
| **Engineering** | 30 | % |
| **Engineering Design** | | % |
| **Social Sciences** | | % |
| **Educational Sciences** | | % |

| | | |
|---|---|---|
| **Natural Sciences** | | % |
| **Health Sciences** | | % |
| **Expert Knowledge** | | % |

## Assessment

| Activity | Count | Percentage (%) |
|---|---|---|
| **Midterm Exam** | 1 | 20 |
| **Quiz** | 1 | 20 |
| **Assignments** | | |
| **Attendance** | | |
| **Recitations** | | |
| **Projects** | | |
| **Final Exam** | 1 | 60 |
| | **Total** | **100** |

## ECTS Points and Work Load

| Activity | Count | Duration | Work Load (Hours) |
|---|---|---|---|
| **Lectures** | 14 | 2 | 28 |
| **Self-Study** | 14 | 2 | 28 |
| **Assignments** | | | |
| **Presentation / Seminar Preparation** | | | |
| **Midterm Exam** | 1 | 2 | 2 |
| **Recitations** | 14 | 2 | 28 |
| **Laboratory** | 14 | 1 | 14 |
| **Projects** | | | |
| **Final Exam** | 1 | 2 | 2 |
| | | **Total Work Load** | **102** |
| | | **ECTS Points** (Total Work Load / Hour) | **6** |

## Learning Outcomes

| | |
|---|---|
| **1** | Learning the basics of probability |
| **2** | Learning about discrete and continuous random variables |
| **3** | Learning multivariate random variables and limit theorems in probability |
| **4** | Learning the basics of descriptive statistics |
| **5** | Learning the basics of point estimation, confidence intervals, and hypothesis testing |
| **6** | Learning the basics of analysis of variance, regression, compatibility tests, non-parametric tests |

## Weekly Content

| | |
|---|---|
| **1** | Fundamentals of probability |

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| | |
|---|---|
| **2** | Discrete random variables |
| **3** | Continuous random variables |
| **4** | Continuous random variables |
| **5** | Multivariate random variables |
| **6** | Multivariate random variables |
| **7** | Descriptive statistics |
| **8** | Point estimation, confidence intervals |
| **9** | Midterm |
| **10** | Confidence intervals |
| **11** | Hypothesis tests |
| **12** | Hypothesis tests, pairwise t-test |
| **13** | Analysis of variance, regression analysis |
| **14** | Compatibility tests |
| **15** | Non-parametric tests |

**Contribution of Learning Outcomes to Program Objectives (1-5)**

| | P1 | P2 | P3 | P4 | P5 | P6 | P7 |
|---|---|---|---|---|---|---|---|
| **1** | | | | | | | |
| **2** | | | | | | | |
| **3** | | | | | | | |
| **4** | | | | | | | |
| **5** | | | | | | | |
| **6** | | | | | | | |
| **7** | | | | | | | |
| **8** | | | | | | | |
| **9** | | | | | | | |

| | |
|---|---|
| **Contribution Level** | 1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High |

**P1 Working with modern scientific sources.**
**P2 Having modern scientific knowledge and scientific analysis abilities and being able to apply them to scientific problems.**
**P3 Having theoretical and practical skills in the area of Energy Science and Technology.**
**P4 Having foreign language skills to follow the worldwide advancements in the field of Energy Science and Technology and to be able to discuss them with foreign colleagues.**
**P5 Having computational skills for research data analysis purposes.**
**P6 Having appropriate skills for academic and industrial jobs, being ready to take responsibility in working life.**
**P7 Having knowledge about work occupational work and safety.**

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