**CANKAYA UNIVERSITY**
**Department of Materials Science and Engineering**
**Micro and Nanotechnology Master's Program**

# Course Definition Form

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|---|---|---|---|---|---|---|---|
| **Department/ Program Name** | MATERIALS SCIENCE AND ENGINEERING/ MICRO AND NANOTECHNOLOGY | | | | **Curriculum Number** | | 3 4 |
| **Course Code** | M N T 0 5 0 1 | **Number of Weekly Lecture Hours** | 3 | **Number of Weekly Lab/Tutorial Hours** | 0 | **Number of Credit Hours** | 3 |
| **Course Web Site** | www.mnt501.cankaya.edu.tr | | | | **ECTS Credit** | | 7.5 |

| **Course Name** *This information will appear in the printed catalogs and on the web online catalog.* | |
|---|---|
| English Name | Fundamentals of Nanotechnology |
| Turkish Name | *Nanoteknolojinin Temelleri* |

**Course Description**
*Provide a brief overview of what is covered during the semester. This information will appear in the printed catalogs and on the web online catalog.*

This course will give a general perspective for nanostructured materials. Nanoparticles, nanorods and thin film synthesis will be introduced and their optical, mechanical, electrical and magnetic properties will be discussed. In addition, nanofibers, nanoporous materials, nanoceramics, nanostructured oxides, nanocrystalline materials and nano/bio-materials will be explained.

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|---|---|---|---|---|
| **Prerequisites** (if any) *Give course codes and check all that are applicable.* | 1st | 2nd | 3rd | 4th |
| | ☐ Consent of the Instructor | ☐ Senior Standing | ☐ Give others, if any. | |
| **Co-requisites** (if any) | 1st | 2nd | 3rd | 4th |
| **Course Type** *Check all that are applicable* | ☒ Must course for prog. | ☐ Must course for other prog.(s) | ☐ Elective course for prog. | ☐ Elective course for other prog.(s) |

**Textbook**(s)
*List the textbook(s), if any, and other related main course materials.*

| Author(s) | Title | Publisher | Publication Year | ISBN |
|---|---|---|---|---|
| Bharat Bhushan (Ed.) | Handbook of Nanotechnology, 3rd edition | Springer Heidelberg Dordrecht London New York | 2010 | 978-3-642-02524-2 |
| Charles P. Poole, Jr. Frank J. Owens | Introduction to Nanotechnology | John Wiley&Sons Inc | 2003 | 0-471-07935-9 |

**Reference Book**s
*List the reference books as supplementary materials, if any.*

| Author(s) | Title | Publisher | Publication Year | ISBN |
|---|---|---|---|---|
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| **Course Outline**<br>*List the topics covered within each week.* | |
|---|---|
| Week | Topic(s) |
| 1 | An Introduction: Nanoscience and Nanotechnology |
| 2 | Evolution of Nanotechnology |
| 3 | Classification and Structure of low dimensional nanostructures: 0D-1D-2D-3D |
| 4 | Carbon based nanomaterials |
| 5 | Porous Nanomaterials |
| 6 | Sculptured Thin Films |
| 7 | Aerogels |
| 8 | Semiconductor Quantum Dots |
| 9 | Nanowires, Nanorods and Nanopillars |
| 10 | Nanocomposites |
| 11 | Properties of Nanomaterials-I |
| 12 | Properties of Nanomaterials-II |
| 13 | Introduction to Production of Nanomaterials: Top-down, Bottom-up approaches |
| 14 | Overview |

| **Grading Policy**<br>*List the assessment tools and their percentages that may give an idea about their relative importance to the end-of-semester grade.* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Assessment Tool | Quantity | Percentage | Assessment Tool | Quantity | Percentage | Assessment Tool | Quantity | Percentage |
| Homework | | | Case Study | | | Attendance | | |
| Quiz | | | Lab Work | | | Field Study | | |
| Midterm Exam | 1 | 25 | Class Participation | | | Project | 1 | 35 |
| Term Paper | | | Oral Presentation | | | Final Exam | 1 | 40 |