



ESOĞÜ Mathematics and Computer Sciences Department
COURSE INFORMATION FORM

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| SEMESTER | Spring |
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| COURSE CODE | 821618007 | COURSE NAME | Fractal Geometry |
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| SEMESTER | WEEKLY COURSE PERIOD | | | COURSE OF | | | |
|----------|----------------------|----------|-----------|-----------|------|-----------------------------|----------|
| | Theory | Practice | Labratory | Credit | ECTS | TYPE | LANGUAGE |
| 8 | 3 | 0 | 0 | 3 | 5 | COMPULSORY (x) ELECTIVE () | Turkish |

COURSE CATAGORY

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|--------------------|-----------------|--|-----------------------|
| Mathematics | Computer | | Social Science |
| x | | | |

ASSESSMENT CRITERIA

| | Evaluation Type | Quantity | % |
|-------------------|-----------------|----------|----|
| MID-TERM | 1st Mid-Term | 1 | 40 |
| | 2nd Mid-Term | | |
| | Quiz | | |
| | Homework | | |
| | Project | | |
| | Report | | |
| | Others (.....) | | |
| FINAL EXAM | | 1 | 60 |

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|------------------------|------|
| PREREQUIEITE(S) | none |
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| COURSE DESCRIPTION | Fractal and its History, Known Fractal Samples, Transformations in Plane, Self Similarity in Fractals, Dimension in some Special Fractals, Hausdorff Dimension |
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| COURSE OBJECTIVES | To introduce geometric structure of living and non-living objects in nature. |
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| ADDITIVE OF COURSE TO APPLY PROFESSIONAL EDUATION | To introduce the cracteristic properties and unchangeable structure of taken object, so that the possibility of comparing it with other objects. |
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| COURSE OUTCOMES | understand and explain the objects in nature as mathematical way. |
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| TEXTBOOK | Hacısalıhoğlu, H.H., Yaz,N., Fraktal Geometri, Ankara Üniversitesi Fen Fak. Matematik Böl. Ankara,2002 |
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| OTHER REFERENCES | 1- Hacısalıhoğlu, H.H., Yaz,N., Fraktal Geometri, Ankara Üniversitesi Fen Fak. Matematik Böl. Ankara,2002 2-Lauwerier, H.A., Fractals Images of Chaos,Translation, Princeton University,1991. 3-Barnsley, M., Fractals Everywhere, Acad. Pres. Inc. 1988. 4-Feoler, J., Fractals, Plenum Pres, New York, 1985 5-Internet . |
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| TOOLS AND EQUIPMENTS REQUIRED | |

COURSE SYLLABUS

| WEEK | TOPICS |
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| 1 | Introduction to fractals |
| 2 | Fractal examples |
| 3 | Geometry of plane transformation, |
| 4 | Self similarity |
| 5 | Midterm |
| 6 | Initiators and Generators |
| 7 | Dimensions |
| 8 | Natural Fractals |
| 9 | L-systems |
| 10 | Midterm |
| 11 | Iterated Function Systems |
| 12 | Random IFS |
| 13 | Inverse Problems |
| 14 | Complex Dynamics |
| 15 | Final |
| 16-17 | Introduction to fractals |

| NO | PROGRAM OUTCOMES | 3 | 2 | 1 |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|
| 1 | The ability to apply knowledges of Mathematics and Computer Sciences, | | x | |
| 2 | To have sufficient theoretical and practical knowledge of Mathematics at international level, | x | | |
| 3 | The ability of describing, modelling and solving of mathematical problems at Mathematics and related subjects, | x | | |
| 4 | The skill to solve and design a problem process in accordance with a defined target, | | x | |
| 5 | Skills to analyze data, interpret and apply to other datum and using these data on computer, | x | | |
| 6 | The skill to use the modern techniques and computational tools needed for mathematical applications, | x | | |
| 7 | The skill to make team work within the discipline and interdisciplinary, | | x | |
| 8 | The ability to improve oneself by following the developments on other modern, scientific and technological subjects as well as Mathematics and Computer Sciences, | x | | |
| 9 | The skill to communicate orally and in written way, in a clear and concise manner by having individual work skills and ability to independently decide and analytical thinking, | x | | |
| 10 | The skill to have professional and ethical responsibility, | x | | |
| 11 | The skill to have consciousness for quality issues and scientific research, | x | | |
| 12 | The skill to be sensitive to environmental issues related with problems and development of living area and consistent in the social relations, | x | | |
| 13 | Ability to solve problems in the working life faced to find an appropriate algorithms via mathematical modeling and to write computer programs, | | x | |
| 14 | The skill to developed design of software systems at different complex levels, | x | | |
| 15 | The credence of necessity of life-long learning and ability to apply the formation long-life learning. | x | | |

1:None. 2:Partially contribution. 3: Completely contribution.

Instructor(s):

Signature:

Date: