**Content**

| Course Code | Course Name | Semester | Theory | Practice | Lab | Credit | ECTS |
|---|---|---|---|---|---|---|---|
| MATH 533 | Selected Topics in Applied Mathematics | 1 | 3 | 0 | 0 | 3 | 7 |

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| Prerequisites | |
| Admission Requirements | |

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| Language of Instruction | English |
| Course Type | Elective |
| Course Level | Masters Degree |
| Objective | Introducing the fundamental problems and their solution methods of applied<br><br>mathematics |
| Content | Sacling, ODE, Perturbation anlaysis, Calculus of variations, Sturm-Liouville problems, Integral equalities, Green functions, Equilibrium equalities, Integral transformations, Wave propagation |
| References | J. David Logan, Applied Mathematics, Wiley, 2006<br><br>Lawrence Sirovich, Introduction to Applied Mathematics, Springer, 1988 |

**Theory Topics**

| Week | Weekly Contents |
|---|---|
| 1 | Dimension analysis and scaling |
| 2 | Ordinary differential equations (summary) |
| 3 | Perturbation methods |
| 4 | Perturbation methods |
| 5 | Calculus of variations |
| 6 | Calculus of variations |
| 7 | Orthogonal expansions |
| 8 | Midterm exam |
| 9 | Sturm-Liouville problems |
| 10 | Integral equalities |
| 11 | Green functions, difference equations |
| 12 | Equilibrium equalities |
| 13 | Integral transformations |
| 14 | Wave propagation eigenfunction expansions wave equation |