

| COURSE DESCRIPTION FORM                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| Course Code and Name                                                                                             | MATH201Differential Equations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Course Semester                                                                                                  | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Catalog Data of the Course (Course Content)                                                                      | Some basic skills such as first and high order differential equations, solutions and applications with Laplace and inverse Laplace transformation and applications.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Textbook of the Course                                                                                           | AdilMısır, TeoriTeknikveUygulamalıDiferensiyelDenklemler, GaziKitabevi, 2016.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Supplementary Textbooks                                                                                          | OgünDoğru, DiferensiyelDenklemlerinTemelleri (ÇeviriKitap), Nobel Yayıncılık, 2013.<br>TahsinEngin, CevdetCerit, FatmaAyaz, MühendislikveTemelBilimleriçinDiferensiyelDenklemler, İzmir GüvenKitabevi, 2013.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Credit (ECTS)                                                                                                    | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Prerequisites of the Course                                                                                      | There is no prerequisite or co-requisite for this course.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Type of the Course                                                                                               | Compulsory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Instruction Language of the Course                                                                               | English                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Course Objectives                                                                                                | To be able to study first and high order differential equations, solutions and applications with Laplace and inverse Laplace transformation and applications.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Learning Outcomes                                                                                                | 1. Learn the definition of differential equation<br>2. Learn the solution methods of differential equations<br>3. Learn the application of differential equations<br>4. Learn Laplace and inverse Laplace transformation and applications                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Instruction Method                                                                                               | The type of this course is face to face.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Weekly Schedule of the Course                                                                                    | 1. Week: Fundamental of differential equations and classification of equations. Geometrical meanings of differential equations.<br>2. Week First order separable and homogeneous equations and their solution procedures:<br>3. Week: Linear differential equations, Bernouilli and Riccati differential equations<br>4. Week: Exact differential equations, integrating factors.<br>5. Week: Some applications of first order differential equations<br>6. Week: First order nonlinear differential equations<br>7. Week: Lagrange and Clairaut differential equations<br>8. Week: Theory of higher order of differential equations, Higher order homogenous differential equations with constant coefficients<br>9. Week: Higher order nonhomogenous differential equations with constant coefficients, Method of undetermined coefficients<br>10. Week: The method of variation of parameters.<br>11. Week: Laplace transformations and their properties<br>12. Week: Inverse Laplace transformations and their properties<br>13. Week: Applications of Laplace and inverse Laplace transformations<br>14. Week: Applications of Laplace and inverse Laplace transformations<br>15. Week: Final Exam |
| Assesment Tasks<br>(The time spent for the activities listed here will determine the amount of credit required.) | Weekly theoretical course hours 4<br>Hours per week 0<br>Reading Activities 0<br>Internet browsing, library work 8<br>Designing and implementing materials 0<br>Report preparing 0<br>Preparing a Presentation 0<br>Presentations 0<br>Preparation of Midterm and Midterm Exam 22<br>Final Exam and Preparation for Final Exam 31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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|-----------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------|------------------------|---|---|---|---|------------------------|
| Assesment Criteria                                              |                                                 | Sayısı                                                                                                | Toplam Katkısı (%)        |                        |   |   |   |   |                        |
|                                                                 | Midterm Exams                                   | 1                                                                                                     | 40                        |                        |   |   |   |   |                        |
|                                                                 | Assignment                                      | 0                                                                                                     | 0                         |                        |   |   |   |   |                        |
|                                                                 | Practice                                        | 0                                                                                                     | 0                         |                        |   |   |   |   |                        |
|                                                                 | Projects                                        | 0                                                                                                     | 0                         |                        |   |   |   |   |                        |
|                                                                 | Practise                                        | 0                                                                                                     | 0                         |                        |   |   |   |   |                        |
|                                                                 | Quizes                                          | 0                                                                                                     | 0                         |                        |   |   |   |   |                        |
|                                                                 | Percent of In-term Studies to Year- to Year (%) | 0                                                                                                     | 40                        |                        |   |   |   |   |                        |
|                                                                 | Percentage of Final Exam to Total Score (%)     | 1                                                                                                     | 60                        |                        |   |   |   |   |                        |
|                                                                 | Attendance                                      |                                                                                                       |                           |                        |   |   |   |   |                        |
| Workload of the Course                                          | Efficiency                                      |                                                                                                       | Total Number of Weeks     | Duration( weekly hour) |   |   |   |   | Total Period Work Load |
|                                                                 | Weekly Theoretical Course Hours                 |                                                                                                       | 14                        | 4                      |   |   |   |   | 56                     |
|                                                                 | Hours Per Week                                  |                                                                                                       | 0                         | 0                      |   |   |   |   | 0                      |
|                                                                 | Reading Tasks                                   |                                                                                                       | 0                         | 0                      |   |   |   |   | 0                      |
|                                                                 | Internet Browsing, Library Work                 |                                                                                                       | 2                         | 8                      |   |   |   |   | 16                     |
|                                                                 | Designing and Implementing Materials            |                                                                                                       | 0                         | 0                      |   |   |   |   | 0                      |
|                                                                 | Report Preparing                                |                                                                                                       | 0                         | 0                      |   |   |   |   | 0                      |
|                                                                 | Preparing a Presentation                        |                                                                                                       | 0                         | 0                      |   |   |   |   | 0                      |
|                                                                 | Presentations                                   |                                                                                                       | 0                         | 0                      |   |   |   |   | 0                      |
|                                                                 | Midterm Exam and Preperation for Midterm Exam   |                                                                                                       | 1                         | 22                     |   |   |   |   | 22                     |
|                                                                 | Final Exam and Preperation for Final Exam       |                                                                                                       | 1                         | 31                     |   |   |   |   | 31                     |
|                                                                 | Other                                           |                                                                                                       | 0                         | 0                      |   |   |   |   | 0                      |
|                                                                 | Total Workload                                  |                                                                                                       |                           |                        |   |   |   |   | 125                    |
|                                                                 | Total Workload / 25                             |                                                                                                       |                           |                        |   |   |   |   | 5                      |
|                                                                 | Course Credit (ECTS)                            |                                                                                                       |                           |                        |   |   |   |   | 5                      |
| Contribution Level Between Course Outcomes and Program Outcomes |                                                 | No                                                                                                    | Program Learning Outcomes | 1                      | 2 | 3 | 4 | 5 |                        |
|                                                                 |                                                 | 1                                                                                                     | PLO1                      |                        |   |   | x |   |                        |
|                                                                 |                                                 | 2                                                                                                     | PLO2                      |                        |   |   | x |   |                        |
|                                                                 |                                                 | 3                                                                                                     | PLO3                      |                        |   | x |   |   |                        |
|                                                                 |                                                 | 4                                                                                                     | PLO4                      |                        | x |   |   |   |                        |
|                                                                 |                                                 | 5                                                                                                     | PLO5                      |                        |   |   | x |   |                        |
|                                                                 |                                                 | 6                                                                                                     | PLO6                      |                        |   | x |   |   |                        |
|                                                                 |                                                 | 7                                                                                                     | PLO7                      |                        |   | x |   |   |                        |
|                                                                 |                                                 | 8                                                                                                     | PLO8                      |                        |   |   | x |   |                        |
|                                                                 |                                                 | 9                                                                                                     | PLO9                      |                        |   | x |   |   |                        |
|                                                                 |                                                 | 10                                                                                                    | PLO10                     |                        |   | x |   |   |                        |
| Names of Lecturers and e-mails of Lecturers                     |                                                 | Mathematics Department Teaching Members<br>E-mail address: fefmatematik@gazi.edu.tr<br>Phone: 2021051 |                           |                        |   |   |   |   |                        |

| No | Program Learning Outcomes                                                                                                                                                |
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| 1  | To train individuals who are contemporary, entrepreneur and have unique and aesthetic values, self- confidence and capable of independent decision-making.               |
| 2  | To enable the student to gain the ability of relating mathematics with the other sciences..                                                                              |
| 3  | To teach mathematical thinking methods in order to improve the ability to express mathematics both orally and in writing.                                                |
| 4  | To train individuals who are knowledgeable about the history of mathematics and the production of scientific knowledge and can follow developments in these disciplines. |
| 5  | To provide necessary equipment to take positions such as banking, finance, econometrics, and actuarial.                                                                  |
| 6  | To acquire ability to solve problems encountered in real life by means of mathematical modeling using mathematical methods.                                              |
| 7  | To provide ability to do necessary resource researches in the areas of mathematics and to use accessed information.                                                      |
| 8  | To give appropriate training in such areas as in computer programming and creating algorithms in order to take parts in developing IT sector.                            |
| 9  | To gain substructure to be able to study at graduate level.                                                                                                              |
| 10 | To enable the student to gain the ability of relating mathematics with the other sciences.                                                                               |