

**Department of Mining, Petroleum and Metallurgical Engineering**

**Cairo University
Faculty of Engineering**

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| **Course Specifications MTH 120B** |
| **Program(s) on which this course is given:** | Mining, Petroleum and Metallurgical Engineering |
| **Department offering the program:** | Mining, Petroleum and Metallurgical Engineering |
| **Department offering the course:** | Math and Engineering Physics |
| **Academic Level:** | 1st year |
| **Date**  | 2014 |
| **Semester (based on final exam timing)** |  Fall Spring |
| **A- Basic Information** |
| **1. Title:** | Mathematics (2) | **Code:** | MTH120B |
| **2. Units/Credit hours per week:**  | Lectures | 3 | Tutorial | 1 | Practical | **0** | Total | 4 |
| **B- Professional Information** |
| **1. Course description:** | At the end of this course, the student should be able to:• Perform multiple integration using different techniques.• Find the best curve fitting for a given data.• Studying the basic principles of interpolation and extrapolation.• Apply different numerical methods to solve ODEs.• Examine the convergence of any numerical techniques.• Apply Laplace transform and the inverse Laplace for a given function. |
| **2. Intended Learning Outcomes of Course (ILOs):** | **a) Knowledge and Understanding** |
| 1- Concepts and theories of mathematics and sciences, appropriate to the discipline. |
| 2- Basics of information and communication technology (ICT)  |
| 3- Methodologies of solving engineering problems, data collection and interpretation |
| 4- Contemporary engineering topics. |
| **b) Intellectual Skills** |
| 5- Select appropriate mathematical and computer-based methods for modeling and analyzing problems.  |
| 6- Select appropriate solutions for engineering problems based on analytical thinking. |
| 7- Think in a creative and innovative way in problem solving and design. |
| 8- Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. |
| 9- Assess and evaluate the characteristics and performance of components, systems and processes. |
| 10- Solve engineering problems, often on the basis of limited and possibly contradicting information.  |
| **c) Professional and Practical Skills** |
| 11- Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. |
| 12- Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services. |
| 13- Create and/or re-design a process, component or system, and carry out specialized engineering designs. |
| 14- Exchange knowledge and skills with engineering community and industry.  |
| 15- Prepare and present technical reports.  |
| 16- Apply of modern science and engineering in the discovery, development, exploitation, and use of natural mineral deposits. |
| **d) General and Transferable Skills** |
| 17- Collaborate effectively within multidisciplinary team. |
| 18- Communicate effectively. |
| 19- Acquire entrepreneurial skills. |
| 20- Refer to relevant literatures. |
| **3. Contents** |
| **Topic** | **Total hours** | **Lectures hours** | **Tutorial/ Practical hours** |
| Multiple integral | 16 | 10 | 6 |
| Curve fitting technique | 12 | 8 | 4 |
| Interpolation | 10 | 6 | 4 |
| Numerical solution of ODE | 14 | 8 | 6 |
| Laplace transform | 18 | 10 | 8 |
| Applications | 5 | 3 | 2 |
| **4. Teaching and Learning Methods** | Lectures (\*)  | Practical Training/ Laboratory ( )  | Seminar/Workshop ( )  |
| Class Activity (\*)  | Case Study ( )  | Projects ( )  |
| E-learning ( )  | Assignments /Homework (\*)  | Other:  |
| **5. Student Assessment Methods** |
| * **Assessment Schedule**
 | **Week** |
| -Assessment 1; Class test  | 4, 6 |
| -Assessment 2; Project Assignment  | 10 |
| -Assessment 3; Presentations  |  |
| -Assessment 3; Midterm Exam | 8 |
| -Assessment 4; Final Exam | 16 |
| * **Weighting of Assessments**
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| -Mid-Term Examination | 15% |
| -Final-term Examination  | 68% |
| -Project | 7% |
| -Class Test | 10% |
| -Presentation |  |
| -Total |  |
| **6. List of References** |
| Lecturer notes (in English). |
| “Mathematics, First Year for Engineering Students”, Department of Engineering Math. & Physics - Faculty of Engineering – Cairo university, 2006. |
| **7. Facilities Required for Teaching and Learning** |
| White board, data show, projector. |
| **Course Coordinator:** | Dr. Abdel Hakam Fadl |
| **Head of Department:**  | Prof. Dr. E.M.Elbana |

