**COURSE SPECIFICATION**

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| This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification. |

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| University of Baghdad | 1. Teaching Institution |
| College of Engineering/ Electronics and Communications Department | 2. University Department/Centre |
| Mathematics II/ 201 ECM | 3. Course title/code |
| Engineering Analysis, Communications I & II, Fields, Antennas, Control Theory, Probability, Information, DSP. | 4. Programme(s) to which it contributes |
| In class face-to-face mode | 5. Modes of Attendance offered |
| 1st-2nd / 2015-2016 | 6. Semester/Year |
| 4 hrs per week/ 120 hrs total | 7. Number of hours tuition (total) |
| 15/2/2016 | 8. Date of production/revision of this specification |
| 9. Aims of the Course | |
| To make the student acquainted with the essential mathematical tools that are necessary for his academic study of the various subjects in electronic and communications engineering | |
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| 10· Learning Outcomes, Teaching ,Learning and Assessment Method |
| 1. Knowledge and Understanding   A1. Basic Concepts of single variable and multivariable calculus.  A2.  A3.  A4.  A5.  A6 . |
| B- Subject-specific skills  B1. Power series  B2. Parametric Equations  B3. Polar Coordinates  B4. Differential Equations  B5. Vector Functions and Vector Fields  B6. Multiple Integral |
| Teaching and Learning Methods |
| 1- Lectures.  2- Tutorials.  3- Homework and Assignments.  4- Tests and Exams.  5- In-Class Questions and Discussions. |
| Assessment methods |
| 1. Quizzes: 10% 2. 1st term exam: 10% 3. 2nd term exam: 10% 4. Final exam: 70% |
| C. Thinking Skills  C1.  C2.  C3.  C4. |

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| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1.  D2.  D3.  D4. |

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| 11. Course Structure | | | | | |
| Assessment Method | Teaching  Method | Unit/Module or Topic Title | ILOs | Hours | Week |
| Quiz/Exam | Lectures | Infinite series |  | 4 | 1 |
| Quiz/Exam | Lectures | Limit of infinite series (convergence and divergence) |  | 4 | 2 |
| Quiz/Exam | Lectures | Power series: Taylor’s series and Maclaurin series |  | 4 | 3 |
| Quiz/Exam | Lectures | Evaluating integrals using power series |  | 4 | 4 |
| Quiz/Exam | Lectures | Equations of conic sections |  | 4 | 5 |
| Quiz/Exam | Lectures | Polar coordinates |  | 4 | 6 |
| Quiz/Exam | Lectures | Graphing in polar coordinates |  | 4 | 7 |
| Quiz/Exam | Lectures | Integration in polar coordinated |  | 4 | 8 |
| Quiz/Exam | Lectures | Vectors |  | 4 | 9 |
| Quiz/Exam | Lectures | Cross product and dot product |  | 4 | 10 |
| Quiz/Exam | Lectures | Line and plane equations in space |  | 4 | 11 |
| Quiz/Exam | Lectures | Cylindrical and spherical coordinates |  | 4 | 12 |
| Quiz/Exam | Lectures | Functions of two or more variables |  | 4 | 13 |
| Quiz/Exam | Lectures | Partial derivative and directional derivative |  | 4 | 14 |
| Quiz/Exam | Lectures | Maximum, minimum and saddle points |  | 4 | 15 |
| Quiz/Exam | Lectures | Lagrange Multipliers |  | 4 | 16 |
| Quiz/Exam | Lectures | Types of differential equations |  | 4 | 17 |
| Quiz/Exam | Lectures | Solution of first order differential equations |  | 4 | 18 |
| Quiz/Exam | Lectures | Solution of second order differential equations |  | 4 | 19 |
| Quiz/Exam | Lectures | Applications: Modeling of electrical circuits |  | 4 | 20 |
| Quiz/Exam | Lectures | Vector valued functions |  | 4 | 21 |
| Quiz/Exam | Lectures | Modeling of projectile functions |  | 4 | 22 |
| Quiz/Exam | Lectures | Curvature and the frame of unit vectors **TNB** |  | 4 | 23 |
| Quiz/Exam | Lectures | Double integral |  | 4 | 24 |
| Quiz/Exam | Lectures | Double integral in polar coordinates |  | 4 | 25 |
| Quiz/Exam | Lectures | Mass, center of mass and moment of inertia |  | 4 | 26 |
| Quiz/Exam | Lectures | Triple integral and cylindrical and spherical coordinates |  | 4 | 27 |
| Quiz/Exam | Lectures | Fields analysis and line integral and surface integral |  | 4 | 28 |
| Quiz/Exam | Lectures | Flux and Green theorem |  | 4 | 29 |
| Quiz/Exam | Lectures | Divergence theorem and Stoke’s theorem |  | 4 | 30 |
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| 12. Infrastructure | |
| **Ross L. Finney and George B. Thomas Jr., *Calculus*, 1990, Addison Wesley Publishing.**  **Maurice D. Weir, Joel Hass, and Frank R. Giordano, *Thomas’ Calculus*, 2008, Person International Edition.** | Required reading:  · CORE TEXTS  · COURSE MATERIALS  · OTHER |
| None | Special requirements (include for example workshops, periodicals, IT software, websites) |
| None | Community-based facilities  (include for example, guest  Lectures , internship , field studies) |

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| 13. Admissions | |
| According to ministry requirements | Pre-requisites |
| 10 | Minimum number of students |
| 50 | Maximum number of students |