**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 |
| Energy Engineering Dept./College of Eng. | 2. University Department/Centre |
|  | 3. Course title/code |
| B.Sc. | 4. Programme(s) to which it contributes |
| Weekly | 5. Modes of Attendance offered |
| Year | 6. Semester/Year |
| 105 h | 7. Number of hours tuition (total) |
| 2016 | 8. Date of production/revision of this specification |
| 9. Aims of the Course | |
| 1- Build a mathematical foundation for students to understand and solve the issues for various engineering applications  2. Development of intellectual ability of students to absorb the necessary solutions to mathematical problems  3. Linking Mathematical curriculum with scientific thought to understand and solve the issues faster with accuracy  4. learn the concept of every mathematical term and linking them with engineering | |
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| 10· Learning Outcomes, Teaching ,Learning and Assessment Methode |
| 1. Knowledge and Understanding   A1.The student learns the rules and the basic concepts of the solution.  A2.Recognizes the principles and basicsto solve engineering equations.  A3. Recognizes the principles and basics of drawing functions. |
| B. Subject-specific skills  B1.Apply all the basic information on the question during the solution  B2.Analysis and interpretation of the necessary steps to solve the equations  B3. Draw figures if it is necessary for solution |
| Teaching and Learning Methods |
| 1. The method of lecturing.  2. Experiential learning.  3. The application of Education.  4. Discussion. |
| Assessment methods |
| A daily and monthly tests and homework |
| C. Thinking Skills  C1.Inference  C2.Understand the question  C3.Solve the problem |

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| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1.Giving students the knowledge skill for mathematical concepts in engineering.  D2. Evaluate the work in a scientific way by students |

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| 11. Course Structure | | | | | |
| Assessment Method | Teaching  Method | Unit/Module or Topic Title | ILOs | Hours | Week |
| Testing | The lecture and discussion | Functions and drawing | General idea of ​​the functions | 4 hour | 1 |
| Testing | The lecture and discussion | Rules offunctions drawing | How to Draw Functions | 4 hour | 2 |
| Testing | The lecture and discussion | Limits and continuity | Rules and basic theories of limits and continuity | 4 hour | 3 |
| Testing | The lecture and discussion | Limits and continuity | Methods of solution of limit and continuity test | 4 hour | 4 |
| Testing | The lecture and discussion | Limits and continuity | Learning solution of limits for special cases | 4 hour | 5 |
| Testing | The lecture and discussion | Derivation | The basic rules and theories of derivation | 4 hour | 6 |
| Testing | The lecture and discussion | Implicit and direct differentiation | Learn implicit and direct differentiation | 4 hour | 7 |
| Testing | The lecture and discussion | Series and derivation law | Learn to use the chain rule | 4 hour | 8 |
| Testing | The lecture and discussion | Applications on the derivation | Learning solution on the derivation process applications | 4 hour | 9 |
| Testing | The lecture and discussion | Integration | Rules and basic theories integration | 4 hour | 10 |
| Testing | The lecture and discussion | Integration by parts | Solution method using integration by parts | 4 hour | 11 |
| Testing | The lecture and discussion | Areas of solids | Ways to find area using integration | 4 hour | 12 |
| Testing | The lecture and discussion | Volumes of solids | Ways to find volume using integration | 4 hour | 13 |
| Testing | The lecture and discussion | The length of the curve | How to find the length of the curve using the integration | 4 hour | 14 |
| Testing | The lecture and discussion | Surface area | How to find a surface area using integration | 4 hour | 15 |
| Testing | The lecture and discussion | Hyperbolic functions | Rules and the basic theories of hyperbolic functions | 3 hour | 16 |
| Testing | The lecture and discussion | inverse Hyperbolic functions | Rules and the basic theories of the inverse hyperbolic function | 3 hour | 17 |
| Testing | The lecture and discussion | Polar Coordinates | Rules and the basic theories of the polar coordinates | 3 hour | 18 |
| Testing | The lecture and discussion | Drawing in polar coordinates | Learn drawing on polar coordinates | 3 hour | 19 |
| Testing | The lecture and discussion | Polar equations of conic suction | How to find the equations of the conic suction | 3 hour | 20 |
| Testing | The lecture and discussion | Vectors | Rules and the basic theories of vectors | 3 hour | 21 |
| Testing | The lecture and discussion | dot and cross product of vectors | Methods and applications of dot and cross product of vectors | 3 hour | 22 |
| Testing | The lecture and discussion | Derivation of Vectors | Learn derivation functions Vector | 3 hour | 23 |
| Testing | The lecture and discussion | Partial derivation | Rules and the basic theories of partial derivation | 3 hour | 24 |
| Testing | The lecture and discussion | Chain rule of partial derivation | The application of the chain rule on the partial derivation | 3 hour | 25 |
| Testing | The lecture and discussion | Double integration | Rules and the basic theories of double integration | 3 hour | 26 |
| Testing | The lecture and discussion | Double integration | Applications on double integration | 3 hour | 27 |
| Testing | The lecture and discussion | Consequences and series | Rules and the basic theories of consequences | 3 hour | 28 |
| Testing | The lecture and discussion | Consequences and series | Rules and theories of series | 3 hour | 29 |
| Testing | The lecture and discussion | Consequences and series | Learn ways of solution for different kind of series | 3 hour | 30 |

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| 12. Infrastructure | |
| **1. Calculus, Finny/Thomas, Fifth edition, Addison-Wesley,USA**  **2.Calculus,Berkey/Blanchard, Third edition, Saunders(HBJ),USA** | Required reading:  · CORE TEXTS  · COURSE MATERIALS  · OTHER |
|  | Special requirements (include for example workshops, periodicals, IT software, websites) |
|  | Community-based facilities  (include for example, guest  Lectures , internship , field studies) |

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| 13. Admissions | |
|  | Pre-requisites |
| 15 | Minimum number of students |
| 30 | Maximum number of students |