



University: *Fayoum University*
Faculty: *Computers and Information*
Department: *Basic Science*



Course Specification

| 1- Basic Information | | |
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| Code: GEN 120 | Course Title: Mathematics(1) | Year/Level: First year – First term |
| Programme: B.Sc degree in Computer Science | Number of units: | Lecture: 4 hrs/ week |
| | | Tutorial: 3 hrs/ week |
| | | Practical: - hrs/ week |

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| 2- Aims of Course: | <p>On completion of this course the successful student will be able to:</p> <ol style="list-style-type: none"> 1. Define some of Basic Concepts s.t. Relations, Groups, Rings, Fields, and Combinatory 2. Explain rules to Solve Consistent Linear Systems Of Equations. 3. Understand some of theory's. 4. Know Trigonometry – Real functions and its Properties; The Limits and Continuity of Real Functions. 5. Understand The Derivative Concept and its Properties. 6. Explain techniques of Integration. 7. Apply and solve the problems (problem-solving skills). |
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| 3- Intended Learning Outcomes | |
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| A- Knowledge and Understanding: | <p>On completing this course, students should have knowledge and understanding of :</p> <p>A3- Demonstrate the essential mathematics and physics relevant to computer science.</p> <p>A8- Express the main concepts of statistics, probability theory, algebra and numerical analysis and their role in the computing and information discipline</p> <p>Through the following:</p> <ol style="list-style-type: none"> a1. Study Propositional Logic, Binary Operations and its Properties, Set Theory. a2. Define some of Basic Concepts s.t. Relations, Groups, Rings, Fields, and Combinatory a3. Understand Theory of Complex Numbers: Properties a4. Understand Theory of Equations: Literal Solutions of Cubic Equation (Cardan) and Quadratic Equation (Ferrari)). a5. Study Binomial Theorem for Non Positive-Integer Powers and Multinomial's, Partial Fractions a6. Define The Derivative Concept, its Properties and Derivatives of the Standard Real Functions. |

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| B- Intellectual Skills: | <p>On completion of this course the successful student will be able to:</p> <p>B2. Determine different computer- system application attributes components, relationships, patterns, architecture, and source of errors.</p> <p>B11. Evaluate a range of innovative design patterns and solutions to solve a computer science problem containing a range of commercial and industrial constraints.</p> <p>B12. Define the standard methodologies for solving information systems problems.</p> <p>Through the following:</p> <p>b1. Study Theory of Complex Numbers Applications.</p> <p>b2 Learn Important Applications: Equations of Tangent and Normal, Lengths of Sub tangent and Subnormal, Extreme, Curve Tracing, Time Rates, Maclurin and Taylor Series</p> <p>b3. Study Related Theorems : Roll, Mean Value, Extended Mean Value, Implicit and Parametric Derivatives, L'Hopital Rule</p> |
| C- Professional and Practical Skills: | <p>C6. Employ the statistical, probabilistic and mathematical techniques in analyzing data and interpreting experimental results.</p> <p>c1. Evaluate Literal Solutions of Cubic Equation (Cardan) and Quadratic Equation (Ferrari)).</p> <p>c2. Evaluate Indefinite Integration Standard Integration</p> <p>c3. Techniques of Integration: Completing a Perfect Square, Partial Fractions, By Parts, Successive Reduction, and Substitution</p> |
| D- General and transferable Skills | ---- |

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| 4-Course Content: | <p>Part (1) Algebra</p> <ol style="list-style-type: none"> 1. Propositional Logic, Binary Operations and its Properties, Set Theory. 2. Basic Concepts of Relations, Groups, Rings, Fields, and Combinatory Cramer's Rule for Solving Consistent Linear Systems Of Equations, Mathematical Induction 3. Binomial Theorem for Non Positive-Integer Powers and Multinomial's, Partial Fractions 4. Theory of Complex Numbers: Properties and Applications. 5. Theory of Equations: Literal Solutions of Cubic Equation (Cardan) and Quadratic Equation (Ferrari)). <p>Part (2) Differential and Integral Calculus (1)</p> <ol style="list-style-type: none"> 1. Trigonometry – Real functions and its Properties; The Limits and Continuity of Real Functions 2. The Derivative Concept and its Properties, Derivatives of the Standard Real Functions: Trigonometric, Inverse Trigonometric; Exponential, Logarithmic; Hyperbolic, Inverse Hyperbolic; 3. Related Theorems : Roll, Mean Value, Extended Mean Value, Implicit and Parametric Derivatives, L'Hopital Rule; 4. Important Applications: Equations of Tangent and Normal, Lengths of Sub tangent and Subnormal, Extreme, Curve |
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| | Tracing, Time Rates, Maclurin and Taylor Series; 5. Indefinite Integration: Standard Integration, Techniques of Integration: Completing a Perfect Square, Partial Fractions, By Parts, Successive Reduction, and Substitution. |
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| 5- Teaching and Learning Methods: | 1. Lectures 2. Tutorials 3. Class discussions 4. Internet searches and Self Studies: |
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| 6- Teaching and Learning Methods for handicapped students : | - |
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| 7- Student Assessment | | | | | | | |
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| A- Assessment Methods: | 1. Midterm written exam 2. Oral Exam 3. Final written exam | | | | | | |
| B- Assessment schedule: | Midterm Examination: Week 7 or 8 Oral Examination: Week 14 Final Examination: Week 15-17 | | | | | | |
| C- Weighting of assessments: | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Year work (Mid-Term Examination)</td> <td style="text-align: right;">20 (13.4%)</td> </tr> <tr> <td style="text-align: center;">Oral exam.</td> <td style="text-align: right;">15(10%)</td> </tr> <tr> <td style="text-align: center;">Final-Term Examination</td> <td style="text-align: right;">115(76.6%)</td> </tr> </table> | Year work (Mid-Term Examination) | 20 (13.4%) | Oral exam. | 15(10%) | Final-Term Examination | 115(76.6%) |
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| Oral exam. | 15(10%) | | | | | | |
| Final-Term Examination | 115(76.6%) | | | | | | |

| 8- Books and References | |
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| A- Notes: | |
| B- Essential Books (Text Books): | AP calculus AB & BC 2016 by Tamara Lefcourt Ruby; Kaplan Publishing (2015) |
| C- Recommended Books: | |
| D- Periodicals, Web sites, ... etc | |

- **Course Coordinator:** Dr. Esha Essawy **Head of Department:** Dr. Amira Edress

Course Content Intended Learning Outcomes Matrix

Course Title: Mathematics (1)

Course Code: GEN 120

| Course Content | Week | Knowledge & Understanding | | | | | | Intellectual Skills | | | Professional & Practical Skills | | |
|--|------|---------------------------|----|----|----|----|----|---------------------|----|----|---------------------------------|----|----|
| | | a1 | a2 | a3 | a4 | a5 | a6 | b1 | b2 | b3 | c1 | c2 | c3 |
| - Propositional Logic - Binary Operations and its Properties - Set Theory | 1 | X | | | | | | | | | | | |
| -Relations, Groups, Rings, Fields, and Combinatory | 2 | | X | | | | | | | | | | |
| -Binomial Theorem for Non Positive-Integer Powers - Multinomial's, Partial Fractions | 3 | | | X | | | | | | | | | |
| -Theory of Complex Numbers | 4 | | | | X | | | | | | | | |
| - Theory of Equations: Literal Solutions of Cubic Equation (Cardan) - Literal Solutions of Quadratic Equation (Ferrari)). | 5 | | | | | X | | | | | | | |
| - The Derivative Concept, its Properties -Derivatives of the Standard Real Functions | 6 | | | | | | X | | | | | | |
| -Theory of Complex Numbers Applications. | 7 | | | | | | | X | | | | | |
| Mid-term exam | 8 | X | X | X | X | X | X | X | | | | | |
| -Important Applications: Equations of Tangent and Normal, Lengths of Sub tangent and Subnormal. -Extreme, Curve Tracing, Time Rates, Maclurin and Taylor Series | 9 | | | | | | X | | X | | | | |
| - Related Theorems : Roll, Mean Value, Extended Mean Value, Implicit -Parametric Derivatives, L'Hopital Rule | 10 | | | | | | X | | | X | | | |
| - Literal Solutions of Cubic Equation (Cardan) and Quadratic Equation (Ferrari)). | 11 | | | | | X | | | | | X | | |
| -Indefinite Integration Standard Integration | 12 | | | | | | | | | | | X | |
| -Techniques of Integration: Completing a Perfect Square, Partial Fractions, By Parts, Successive Reduction, and Substitution | 13 | | | | | | | | | | | | X |
| -Revision | 14 | X | X | X | X | X | X | X | X | X | X | X | X |

Course coordinator: Dr. Dr. Esha Essawy

Head of Department: Dr. Amira Edress