**Biomedical Engineering Program Specification**

# Course Specification of Mathematics (1)

## I. Course Identification and General Information:

| | | | | | | |
|---|---|---|---|---|---|---|
| 1- | Course title: | Mathematics (1). | | | | |
| 2- | Course Number & Code: | FR001 | | | | |
| 3- | Credit hours: | **C.H** | | | | **Total Cr. Hr.** |
| | | **Th.** | **Seminar** | **Pr.** | **Tu.** | |
| | | 2 | - | - | 2 | 3 |
| 4- | Study level/year at which this course is offered: | First Year-First Semester. | | | | |
| 5- | Pre –requisite (if any): | None. | | | | |
| 6- | Co –requisite (if any): | None. | | | | |
| 7- | Program (s) in which the course is offered | Biomedical Engineering Program. | | | | |
| 8- | Language of teaching the course: | English Language. | | | | |
| 9- | System of Study: | Semesters. | | | | |
| 10- | Mode of delivery: | Lectures and Tutorials. | | | | |
| 11- | Location of teaching the course: | Biomedical Engineering Department. | | | | |
| 12- | Prepared by: | Assoc. Prof. Dr. Adnan Khalid Al-Salihi. | | | | |
| 13- | Date of approval: | | | | | |

## II. Course Description:

This course prepared to be a primary education in the first branch of the calculus (differential calculus), whereas focus on the fundamental concepts of: Real functions, Limits of the functions, Continuity of the functions, Derivatives of the functions, The complex numbers, Matrices and determinants and how to use them to get solution of simultaneous linear equations, Study properties of functions by using algebra and graphical methods that include plotting points, determining symmetry, and making horizontal or vertical shifts.

The Calculus was invented as a tool for investigating problems that involve motion, Algebra and



trigonometry, may be used to study objects that move at constant speed along linear or circular paths. Modern day applications of the derivative include investigating the rate of growth of bacteria in the culture, predicating the outcome of a chemical reaction, measuring instantaneous change in electrical current, describing the behavior of atomic particles, forecasting economic profits and losses and analyzing vibrations Biomedical systems, and it is also useful in solving problems that involving maximum or minimum values, So mathematics is necessary to underpin education in Biomedical engineering.

| III.Course Intended learning outcomes (CILOs) of the course | | Referenced PILOs |
|---|---|---|
| **a1.** | Characterize the real functions, and how to solve linear inequality, quadratic inequality, modulus equation in the domain of the set of real numbers. | A1, A3. |
| **a2.** | Classify the properties of the limits and continuity and basic rules of differentiation and how can deal with their calculations. | A1, A3. |
| **b1.** | Combine different methods of differentiation to solve applied problems. | B1, B2. |
| **b2.** | Create a smooth transition into the interactive problem solving. | B1, B2. |
| **c1.** | Demonstrate the graphs of the algebraic and transcendental functions by using properties, rigid and non-rigid transformations. | C2. |
| **c2.** | Compute a mathematical model use the elementary functions and estimate its solution as engineering applications. | C2. |
| **d1.** | Examine applications such as apply mathematical concepts, principles and methods in practical engineering problems within the required time efficiently. | D1, D3. |
| **d2.** | Cooperate and work effectively in group or individually. | D3. |

| **(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:** | | |
|---|---|---|
| Course Intended Learning Outcomes | Teaching Strategies | Assessment Strategies |

# Biomedical Engineering Program Specification

| | | |
|---|---|---|
| **a1.** Characterize the real functions, and how to solve linear inequality, quadratic inequality, modulus equation in the domain of the set of real numbers. | Lecture and Tutorial Class. | Assignments (Quizzes & Homework). |
| **a2.** Classify the properties of the limits and continuity and basic rules of differentiation and how can deal with their calculations. | Lecture and Tutorial Class. | Assignments (Quizzes & Homework). |

**(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:**

| Course Intended Learning Outcomes | Teaching Strategies | Assessment Strategies |
|---|---|---|
| **b1**. Combine different methods of differentiation to solve applied problems. | Lecture and Tutorial Class. | Assignments (Quizzes & Homework). |
| **b2.** Create a smooth transition into the interactive problem solving. | Lecture and Tutorial Class. | Assignments (Quizzes & Homework). |

**© Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

| Course Intended Learning Outcomes | Teaching Strategies | Assessment Strategies |
|---|---|---|
| **c1.** Demonstrate the graphs of the algebraic and transcendental functions by using properties, rigid and non-rigid transformations. | Lecture and Tutorial Class. | Assignments (Quizzes & Homework). |
| **c2.** Compute a mathematical model use the elementary functions and estimate its solution as engineering applications. | Lecture and Tutorial Class. | Assignments (Quizzes & Homework). |

**(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:**

# Biomedical Engineering Program Specification

| Course Intended Learning Outcomes | Teaching strategies | Assessment Strategies |
|---|---|---|
| **d1.** Examine applications such as apply mathematical concepts, principles and methods in practical engineering problems within the required time efficiently. | Lecture and Tutorial Class**.** | Assignments (Quizzes and Home works). |
| **d2.** Cooperate and work effectively in group or individually. | Lecture and Tutorial Class**.** | Assignments (Quizzes and Home works). |

## IV. Course Content:

### A – Theoretical Aspect:

| Order | Units/Topics List | Learning Outcomes | Sub Topics List | Number of Weeks | Contact Hours |
|---|---|---|---|---|---|
| 1. | Arithmetic and Introduction to Algebra. | a1, d2. | • Types of number and powers.<br>• Inequalities and absolute value.<br>• Introduction to algebra (powers, logarithms, factorization of algebraic expressions).<br>• Algebraic expressions, equations and functions. | 1 | 2 |
| 2. | Functions and their Graphs. | a1,b2,c1, c2,d1 | • Rectangular coordinates.<br>• Graphs of equations.<br>• Linear equations in two Variables.<br>• Functions and their Graphs.<br>• Combinations of functions: composite functions and inverse functions. | 1 | 2 |
| 3. | Polynomial and Rational | a1,a2,b2,c1, c2,d1,d2 | • Quadratic and polynomial functions of higher degree. | 1 | 2 |

## Biomedical Engineering Program Specification

# IV. Course Content:

## A – Theoretical Aspect:

| Order | Units/Topics List | Learning Outcomes | Sub Topics List | Number of Weeks | Contact Hours |
|---|---|---|---|---|---|
| | Functions. | | • Polynomial and synthetic division<br>• Complex numbers and zeros of polynomial functions.<br>• Rational functions.<br>• Non-linear inequalities. | | |
| 4. | Exponential and Logarithmic Functions. | a1,a2, b2,c1,c2, d1,d2. | • Exponential functions, properties and graphs.<br>• Logarithmic functions, properties and graphs.<br>• Exponential and logarithmic equations.<br>• Exponential and logarithmic models. | 1 | 2 |
| 5. | Trigonometric and Inverse Trigonometric Functions. | a1,a2, b2,c1,c2, d1,d2 | • Trigonometric functions, properties and graphs.<br>• Inverse trigonometric functions, properties and graphs. | 1 | 2 |
| 6. | Hyperbolic and Inverse Hyperbolic Functions. | a1,a2, b2,c1,c2, d1,d2 | • Hyperbolic functions, properties and graphs.<br>• Inverse hyperbolic functions, properties and graphs. | 1 | 2 |
| 7. | Limits and Continuity. | a1,a2 , b2,c1,c2, d1,d2. | • Limits and their properties.<br>• Techniques for evaluating limits.<br>• Continuity of a function. | 1 | 2 |
| 8. | Mid-Term Exam. | a1, a2, b1, | • The First 7 Chapters. | 1 | 2 |

## Biomedical Engineering Program Specification

### IV. Course Content:

#### A – Theoretical Aspect:

| Order | Units/Topics List | Learning Outcomes | Sub Topics List | Number of Weeks | Contact Hours |
|---|---|---|---|---|---|
| | | b2, c1, c2. | | | |
| 9. | Differentiation. | a1,a2, b1,b2,c1,c2 , d1,d2. | • The Derivative and the tangent, line problem.<br>• Basic differentiation rules. | 1 | 2 |
| 10. | Differentiation. | a1,a2, b1,b2,c1,c2 , d1,d2. | • Higher-order derivatives.<br>• The chain rule.<br>• Implicit differentiation. | 1 | 2 |
| 11. | Differentiation. | a1,a2, b1,b2,c1,c2 , d1,d2. | • Derivatives of exponential, logarithmic, trigonometric and inverse trigonometric function. | 1 | 2 |
| 12. | Differentiation. | a1,a2, b1,b2,c1,c2 , d1,d2. | • Derivatives of hyperbolic and inverse hyperbolic functions. | 1 | 2 |
| 13. | Applications of Differentiation. | a1,a2,b1, b2,c1,c2, d1,d2. | • Extrema on an interval.<br>• Rolle's theorem and the mean value theorem.<br>• Increasing and decreasing functions and the first.<br>• Concavity and the 2nd derivative test. | 1 | 2 |
| 14. | Matrices and. Determinants. | a1,a2,b2, c1,c2, d1,d2. | • Operations with matrices.<br>• The inverse of a matrix.<br>• The determinant of a matrix.<br>• Properties of determinants. | 1 | 2 |
| 15. | Solving Systems | a1,a2,b2, | • Matrices and systems of | 1 | 2 |

## Biomedical Engineering Program Specification

## IV. Course Content:

### A – Theoretical Aspect:

| Order | Units/Topics List | Learning Outcomes | Sub Topics List | Number of Weeks | Contact Hours |
|---|---|---|---|---|---|
| | of Linear Equations by using Matrices and Determinants. | c1,c2, d1,d2. | equations.<br>• Cramer's rule.<br>• Use Gauss-Jordan and Gaussian elimination to solve systems of linear equations. | | |
| 16. | Final Exam. | a1, a2, b1, b2, c1, c2. | • All the Chapters. | 1 | 2 |
| **Number of Weeks /and Units Per Semester** | | | | **16** | **32** |

## Biomedical Engineering Program Specification

**B- Tutorial Aspect:**

| Order | Tasks/ Experiments | Number of Weeks | Contact Hours | Learning Outcomes |
|---|---|---|---|---|
| 1. | Arithmetic and Introduction to Algebra. | 1 | 2 | a1, d2. |
| 2. | Functions and their Graphs. | 1 | 2 | a1,b2,c1, c2,d1 |
| 3. | Polynomial and Rational Functions. | 1 | 2 | a1,a2,b2,c1, c2,d1,d2 |
| 4. | Exponential and Logarithmic Functions. | 1 | 2 | a1,a2, b2,c1,c2, d1,d2. |
| 5. | Trigonometric and Inverse Trigonometric Functions. | 1 | 2 | a1,a2, b2,c1,c2, d1,d2 |
| 6. | Hyperbolic and Inverse Hyperbolic Functions. | 1 | 2 | a1,a2, b2,c1,c2, d1,d2 |
| 7. | Limits and Continuity. | 1 | 2 | a1,a2 , b2,c1,c2, d1,d2. |
| 8. | Differentiation. | 1 | 2 | a1,a2, b1,b2,c1,c2, d1,d2. |
| 9. | Differentiation. | 1 | 2 | a1,a2, b1,b2,c1,c2, d1,d2. |
| 10. | Differentiation. | 1 | 2 | a1,a2, b1,b2,c1,c2, d1,d2. |
| 11. | Differentiation. | 1 | 2 | a1,a2, b1,b2,c1,c2, d1,d2. |
| 12. | Applications of Differentiation. | 1 | 2 | a1,a2,b1, b2,c1,c2, d1,d2. |
| 13. | Matrices and Determinants. | 1 | 2 | a1,a2,b2, c1,c2, d1,d2. |
| 14. | Solving Systems of Linear Equations by using Matrices and Determinants. | 1 | 2 | a1,a2,b2, c1,c2, d1,d2. |
| **Number of Weeks /and Units Per Semester** | | **14** | **28** | |

## Biomedical Engineering Program Specification

## V. Teaching strategies of the course:

1. Lectures.
2. Tutorial Class.
3. Interactive Class Discussion.
4. Presentations.

## VI. Assignments:

| No | Assignments | Aligned CILOs(symbols) | Week Due | Mark |
|---|---|---|---|---|
| 1. | Quizzes and class activities (exercises and discussions). | a1,a2,b1,b2, c1,c2, d1, d2. | Every 2 weeks | 10 |
| 2. | Homework . | a1,a2,b1,b2, c1,c2,d1,d2. | Every 2 weeks | 10 |
| **Total** | | | | **20** |

## VII. Schedule of Assessment Tasks for Students During the Semester:

| No. | Assessment Method | Week Due | Mark | Proportion of Final Assessment | Aligned Course Learning Outcomes |
|---|---|---|---|---|---|
| 1. | Quizzes and Class Activities (exercises and discussions). | Every 2 weeks | 15 | 10% | a1,a2,b1,b2, c1,c2, d1, d2. |
| 2. | Homework. | Every 2 weeks | 15 | 10% | a1,a2,b1,b2, c1,c2, d1, d2. |
| 3. | Mid-Term Exam. | On the 8th week | 15 | 10% | a1,a2,b1,b2, c1,c2. |
| 4. | Final Exam. | On the 16th week | 105 | 70% | a1,a2,b1,b2, c1,c2. |
| **Total** | | | **150** | **100%** | |

Head of Department
Dr. Mohammed A. Al-Olofi

Quality Assurance Unit
Ass. Prof. Dr. Mohammad Algorafi

Dean of the Faculty
Prof. Dr. Mohammed AL-Bukhaiti

Academic Development Center & Quality Assurance
Ass. Prof. Dr. Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas

## Biomedical Engineering Program Specification

## VIII. Learning Resources:

- Written in the following order: ( Author - Year of publication – Title – Edition – Place of publication – Publisher).

**1- Required Textbook(s) ( maximum two ).**

1- Bruce H, Ron Larson and Robert Hostler, 2008, Essential Calculus Early Transcendental Functions, Edwards, Houghton Mifflin Company Boston New York.
2- George B. Thomas , 2014, Calculus Thirteenth Edition, Pearson Education, Inc.

**2- Essential References.**

1- John Bird, 2006, Higher Engineering Mathematics Fifth Edition, Elsevier Ltd.

**3- Electronic Materials and Web Sites *etc*.**

## IX. Course Policies:

| | |
|---|---|
| 1. | **Class Attendance:** The students should have more than 75 % of attendance according to rules and regulations of the faculty. |
| 2. | **Tardy**: The students should respect the timing of attending the lectures. They should attend within 1 minute from starting of the lecture. |
| 3. | **Exam Attendance/Punctuality:** The student should attend the exam on time. The punctuality should be implemented according to rules and regulations of the faculty for midterm exam and final exam. |
| 4. | **Assignments & Projects:** The assignment is given to the students after each chapter, the student has to submit all the assignments for checking on time. |

# Biomedical Engineering Program Specification

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|---|---|
| 5. | **Cheating**:<br>If any cheating occurred during the examination, the student is not allowed to continue and he/she has to face the examination committee for enquires. |
| 6. | **Plagiarism**:<br>The student will be terminated from the Faculty, if one student attends the exam on another behalf according to the policy, rules and regulations of the university. |
| 7. | **Other Policies:**<br>• All the teaching materials should be kept out the examination hall.<br>• The mobile phone is not allowed.<br>• There should be a respect between the student and his teacher. |

| | |
|---|---|
| Reviewed By | Vice Dean for Academic Affairs and Post Graduate Studies: Asst. Prof. Dr. Tarek A. Barakat.<br>President of Quality Assurance Unit: Assoc. Prof. Dr. Mohammed Algorafi.<br>Head of Biomedical Engineering Department: Assoc. Prof. Dr. Abdul-Malik Momin.<br>Assoc. Prof. Dr. Riyadh Muharam. |
| | Deputy Rector for Academic Affairs Assoc. Prof. Dr. Ibrahim AlMutaa.<br>Assoc. Prof. Dr. Ahmed Mujahed.<br>Asst. Prof. Dr. Munaser Alsubari. |

## Biomedical Engineering Program Specification

# Template for Course Plan of Mathematics (1)

| I. Information about Faculty Member Responsible for the Course: | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Name of Faculty Member** | Assoc. Prof. Dr. Adnan Khalid Al-Salihi | **Office Hours** | | | | | |
| **Location& Telephone No.** | 00967770499879 | **SAT** | **SUN** | **MON** | **TUE** | **WED** | **THU** |
| **E-mail** | Adnans2000@gmail.com | | | | | | |

| II. Course Identification and General Information: | | | | | | |
|---|---|---|---|---|---|---|
| 1. | Course Title: | Mathematics (1). | | | | |
| 2. | Course Number & Code: | FR001 | | | | |
| 3. | Credit hours: | **C.H** | | | | **Total Cr. Hr.** |
| | | **Th.** | **Seminar** | **Pr.** | **Tu.** | |
| | | 2 | - | - | 2 | 3 |
| 4. | Study level/year at which this course is offered: | First Year-First Semester. | | | | |
| 5. | Pre –requisite (if any): | None. | | | | |
| 6. | Co –requisite (if any): | None. | | | | |
| 7. | Program (s) in which the course is offered | Biomedical Engineering Program. | | | | |
| 8. | Language of teaching the course: | English Language. | | | | |
| 9. | System of Study: | Semesters. | | | | |
| 10. | Mode of delivery: | Lectures and Tutorials. | | | | |
| 11. | Location of teaching the course: | Biomedical Engineering Department. | | | | |

## III. Course Description:

This course prepared to be a primary education in the first branch of the calculus (differential calculus), whereas focus on the fundamental concepts of: Real functions, Limits of the functions, Continuity of the functions, Derivatives of the functions, The complex numbers, Matrices and



| |
|---|
| determinants and how to use them to get solution of simultaneous linear equations, Study properties of functions by using algebra and graphical methods that include plotting points, determining symmetry, and making horizontal or vertical shifts. The Calculus was invented as a tool for investigating problems that involve motion, Algebra and trigonometry, may be used to study objects that move at constant speed along linear or circular paths. Modern day applications of the derivative include investigating the rate of growth of bacteria in the culture, predicating the outcome of a chemical reaction, measuring instantaneous change in electrical current, describing the behavior of atomic particles, forecasting economic profits and losses and analyzing vibrations Biomedical systems, and it is also useful in solving problems that involving maximum or minimum values, So mathematics is necessary to underpin education in Biomedical engineering. |

| IV. Course Intended learning outcomes (CILOs) of the course | | Referenced PILOs |
|---|---|---|
| **a1.** | Characterize the real functions, and how to solve linear inequality, quadratic inequality, modulus equation in the domain of the set of real numbers. | A1, A3. |
| **a2.** | List the properties of the limits and continuity and basic rules of differentiation and how can deal with their calculations. | A1, A3. |
| **b1.** | Combine different methods of differentiation to solve applied problems. | B1, B2. |
| **b2.** | Create a smooth transition into the interactive problem solving. | B1, B2. |
| **c1.** | Demonstrate the graphs of the algebraic and transcendental functions by using properties, rigid and non-rigid transformations. | C2. |
| **c2.** | Compute a mathematical model use the elementary functions and estimate its solution as engineering applications. | C2. |
| **d1.** | Examine applications such as apply mathematical concepts, principles and methods in practical engineering problems within the required time efficiently. | D1, D3. |
| **d2.** | Cooperate and work effectively in group or individually. | D3. |

# Biomedical Engineering Program Specification

## Biomedical Engineering Program Specification

# V. Course Content:

## A – Theoretical Aspect:

| Order | Units/Topics List | Sub Topics List | Number of Weeks | Contact Hours |
|---|---|---|---|---|
| 1. | Arithmetic and Introduction to Algebra. | • Types of number and powers.<br>• Inequalities and absolute value.<br>• Introduction to algebra (powers, logarithms, factorization of algebraic expressions).<br>• Algebraic expressions, equations and functions. | 1 | 2 |
| 2. | Functions and their Graphs. | • Rectangular coordinates.<br>• Graphs of equations.<br>• Linear equations in two Variables.<br>• Functions and their Graphs.<br>• Combinations of functions: composite functions and inverse functions. | 2 | 2 |
| 3. | Polynomial and Rational Functions. | • Quadratic and polynomial functions of higher degree.<br>• Polynomial and synthetic division<br>• Complex numbers and zeros of polynomial functions.<br>• Rational functions.<br>• Non-linear inequalities. | 3 | 2 |
| 4. | Exponential and Logarithmic Functions. | • Exponential functions, properties and graphs.<br>• Logarithmic functions, properties and graphs.<br>• Exponential and logarithmic equations.<br>• Exponential and logarithmic models. | 4 | 2 |
| 5. | Trigonometric and Inverse Trigonometric Functions. | • Trigonometric functions, properties and graphs.<br>• Inverse trigonometric functions, properties and graphs. | 5 | 2 |
| 6. | Hyperbolic and | • Hyperbolic functions, properties and graphs. | 6 | 2 |

## Biomedical Engineering Program Specification

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|---|---|---|---|---|
| | Inverse Hyperbolic Functions. | • Inverse hyperbolic functions, properties and graphs. | | |
| 7. | Limits and Continuity. | • Limits and their properties.<br>• Techniques for evaluating limits.<br>• Continuity of a function. | 7 | 2 |
| 8. | Mid-Term Exam. | • The First 7 Chapters. | 8 | 2 |
| 9. | Differentiation. | • The Derivative and the tangent, line problem.<br>• Basic differentiation rules. | 9 | 2 |
| 10. | Differentiation. | • Higher-order derivatives.<br>• The chain rule.<br>• Implicit differentiation. | 10 | 2 |
| 11. | Differentiation. | • Derivatives of exponential, logarithmic, trigonometric and inverse trigonometric function. | 11 | 2 |
| 12. | Differentiation. | • Derivatives of hyperbolic and inverse hyperbolic functions. | 12 | 2 |
| 13. | Applications of Differentiation. | • Extrema on an interval.<br>• Rolle's theorem and the mean value theorem.<br>• Increasing and decreasing functions and the first.<br>• Concavity and the 2nd derivative test. | 13 | 2 |
| 14. | Matrices and. Determinants. | • Operations with matrices.<br>• The inverse of a matrix.<br>• The determinant of a matrix.<br>• Properties of determinants. | 14 | 2 |
| 15. | Solving Systems of Linear Equations by using Matrices and Determinants. | • Matrices and systems of equations.<br>• Cramer's rule.<br>• Use Gauss-Jordan and Gaussian elimination to solve systems of linear equations. | 15 | 2 |
| 16. | Final Exam. | • All the Chapters. | 16 | 2 |

# Biomedical Engineering Program Specification

| Number of Weeks /and Units Per Semester | 16 | 32 |
|---|---|---|

## B- Tutorial Aspect:

| Order | Tasks/ Experiments | Number of Weeks | Contact Hours | Learning Outcomes |
|---|---|---|---|---|
| **1.** | Arithmetic and Introduction to Algebra. | 1 | 2 | a1, d2. |
| **2.** | Functions and their Graphs. | **2** | 2 | a1,b2,c1, c2,d1 |
| **3.** | Polynomial and Rational Functions. | **3** | 2 | a1,a2,b2,c1, c2,d1,d2 |
| **4.** | Exponential and Logarithmic Functions. | **4** | 2 | a1,a2, b2,c1,c2, d1,d2. |
| **5.** | Trigonometric and Inverse Trigonometric Functions. | **5** | 2 | a1,a2, b2,c1,c2, d1,d2 |
| **6.** | Hyperbolic and Inverse Hyperbolic Functions. | **6** | 2 | a1,a2, b2,c1,c2, d1,d2 |
| **7.** | Limits and Continuity. | **7** | 2 | a1,a2 , b2,c1,c2, d1,d2. |
| **8.** | Differentiation. | **8** | 2 | a1,a2, b1,b2,c1,c2, d1,d2. |
| **9.** | Differentiation. | **9** | 2 | a1,a2, b1,b2,c1,c2, d1,d2. |
| **10.** | Differentiation. | **10** | 2 | a1,a2, b1,b2,c1,c2, d1,d2. |
| **11.** | Differentiation. | 11 | 2 | a1,a2, b1,b2,c1,c2, d1,d2. |
| **12.** | Applications of Differentiation. | 12 | 2 | a1,a2,b1, b2,c1,c2, d1,d2. |
| **13.** | Matrices and Determinants. | 13 | 2 | a1,a2,b2, c1,c2, d1,d2. |



| | | | | |
|---|---|---|---|---|
| **14.** | Solving Systems of Linear Equations by using Matrices and Determinants. | 14 | 2 | a1,a2,b2, c1,c2, d1,d2. |
| **Number of Weeks /and Units Per Semester** | | **14** | **28** | |

## VI. Teaching strategies of the course:

1. Lectures.
2. Tutorial Class.
3. Interactive Class Discussion.
4. Presentations.

## Biomedical Engineering Program Specification

## VII. Assignments:

| No | Assignments | Aligned CILOs(symbols) | Week Due | Mark |
|---|---|---|---|---|
| 1. | Quizzes and Class Activities (exercises and discussions). | a1,a2,b1,b2, c1,c2, d1, d2. | Every 2 weeks | 10 |
| 2. | Homework . | a1,a2,b1,b2, c1,c2,d1,d2. | Every 2 weeks | 10 |
| **Total** | | | | **20** |

## VIII. Schedule of Assessment Tasks for Students During the Semester:

| No. | Assessment Method | Week Due | Mark | Proportion of Final Assessment | Aligned Course Learning Outcomes |
|---|---|---|---|---|---|
| 1 | Quizzes and Class Activities (exercises and discussions). | Every 2 weeks | 15 | 10% | a1,a2,b1,b2, c1,c2, d1, d2. |
| 2 | Homework. | Every 2 weeks | 15 | 10% | a1,a2,b1,b2, c1,c2, d1, d2. |
| 3 | Mid-Term Exam. | On the 8th week | 15 | 10% | a1,a2,b1,b2, c1,c2. |
| 4 | Final Exam. | On the 16th week | 105 | 70% | a1,a2,b1,b2, c1,c2. |
| **Total** | | | **150** | **100%** | |

## IX. Learning Resources:

- Written in the following order: ( Author - Year of publication – Title – Edition – Place of publication – Publisher).

**1- Required Textbook(s) ( maximum two ).**

| | |
|---|---|
| | 1 Bruce H ,Ron Larson and Robert Hostler, 2008, Essential Calculus Early Transcendental Functions, Edwards, Houghton Mifflin Company Boston New |

## Biomedical Engineering Program Specification

| | |
|---|---|
| | York.<br>2 George B. Thomas , 2014, Calculus Thirteenth Edition, Pearson Education, Inc. |
| **2- Essential References.** | |
| | 1- John Bird, 2006, Higher Engineering Mathematics, Fifth Edition Elsevier Ltd. |

## Biomedical Engineering Program Specification

| X. Course Policies: | |
|---|---|
| 1. | **Class Attendance:**<br>The students should have more than 75 % of attendance according to rules and regulations of the faculty. |
| 2. | **Tardy**:<br>The students should respect the timing of attending the lectures. They should attend within 1 minute from starting of the lecture. |
| 3. | **Exam Attendance/Punctuality:**<br>The student should attend the exam on time. The punctuality should be implemented according to rules and regulations of the faculty for midterm exam and final exam. |
| 4. | **Assignments & Projects:**<br>The assignment is given to the students after each chapter, the student has to submit all the assignments for checking on time. |
| 5. | **Cheating**:<br>If any cheating occurred during the examination, the student is not allowed to continue and he/she has to face the examination committee for enquires. |
| 6. | **Plagiarism**:<br>The student will be terminated from the Faculty, if one student attends the exam on another behalf according to the policy, rules and regulations of the university. |
| 7. | **Other Policies:**<br>• All the teaching materials should be kept out the examination hall.<br>• The mobile phone is not allowed.<br>• There should be a respect between the student and his teacher. |

# Biomedical Engineering Program Specification