



Course Specifications

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|----------------------|---|
| Course Title: | Mathematics II |
| Course Code: | MATH143 |
| Program: | Foundation Year Level 2 |
| Department: | Mathematics |
| College: | Science And Humanities |
| Institution: | Prince Sattam Bin Abdulaziz University |

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A. Course Identification

| | |
|---|---|
| 1. Credit hours: | 4 (3,1,0) |
| 2. Course type | |
| a. | University <input type="checkbox"/> College <input checked="" type="checkbox"/> Department <input type="checkbox"/> Others <input type="checkbox"/> |
| b. | Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/> |
| 3. Level/year at which this course is offered: | - Foundation Year - Level 1 |
| 4. Pre-requisites for this course (if any): | NA |
| 5. Co-requisites for this course (if any): | NA |

6. Mode of Instruction (mark all that apply)

| No | Mode of Instruction | Contact Hours | Percentage |
|----|-----------------------|----------------|------------|
| 1 | Traditional classroom | Weekly 4 hours | 100 |
| 2 | Blended | | |
| 3 | E-learning | | |
| 4 | Correspondence | | |
| 5 | Other | Weekly 5 hours | |

7. Contact Hours (based on academic semester)

| No | Activity | Contact Hours |
|----|--|---------------|
| 1 | Lecture (12 x 3) | 36 |
| 2 | Laboratory/Studio | |
| 3 | Tutorial (12 x 1) | 12 |
| 4 | Others (specify) - Office hours 5 hours a week | 60 |
| | Total | 108 |

B. Course Objectives and Learning Outcomes

| |
|---|
| <p>1. Course Description</p> <p>Function: Definition, Domain and range-Limits – Continuity– Derivatives – Implicit Differentiations – Applications to Calculus– L'Hospital rule – Maxima and Minima-Integration: indefinite and definite integral, integration by substitution and by parts- Geometry: Cartesian coordinate system, distance between two points, distance between line and point, slope of line, equation of a line, parallel and perpendicular lines, sketching the graph of a line, dividing the line into a given ratio, area of triangle, polar coordinates- Principles of counting, fundamental rule of counting, permutation rule, combination rule.</p> |
| <p>2. Course Main Objective</p> <p>The main objective of this course is to provide students with a strong foundation in mathematical concepts such as differentiation and integration which are essential for evaluating cost, revenue functions etc.</p> |

3. Course Learning Outcomes

| CLOs | | Aligned PLOs |
|----------|---|--------------|
| 1 | Knowledge and Understanding | |
| 1.1 | Acquire knowledge about function, limits, continuity, differentiation and integration | |
| 1.2 | Understand various applications of calculus in Economics | |
| 2 | Skills | |
| 2.1 | Able to find derivatives and integrate using various techniques | |
| 2.2 | Able to find maxima, minima | |
| 2.3 | Able to find equation of line and its slope and sketch the graph | |

C. Course Content

| No | List of Topics | Contact Hours |
|--------------|---|---------------|
| 1 | Review of Basic concepts of numbers and functions and Graph | 4 |
| 2 | Limits | 8 |
| 3 | Continuity | 4 |
| 4 | Derivatives | 4 |
| 5 | Application to calculus | 8 |
| 6 | Integration | 4 |
| 7 | Geometry | 8 |
| 8 | Principles of counting | 8 |
| Total | | 48 |

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

| Code | Course Learning Outcomes | Teaching Strategies | Assessment Methods |
|------------|---|--|--|
| 1.0 | Knowledge and Understanding | | |
| 1.1 | Acquire knowledge about function, limits, continuity, differentiation and integration | 1. Class Room Lectures 2. Interactive sessions 3. Exclusive Office Hours for clearing doubts in small groups | 1. Mid Exam 2. At least three Quiz 3. End Semester Exam |
| 1.2 | Understand various applications of calculus in Economics | | |
| 2.0 | Skills | | |
| 2.1 | Able to find derivatives and integrate using various techniques | 1. Application oriented exercises during tutorial session. 2. Homework to improve the analytical skills | 1. Homework 2. Assignments 3. Quiz 4. Mid Term and Final Exam |
| 2.2 | Able to find maxima, minima | | |

| Code | Course Learning Outcomes | Teaching Strategies | Assessment Methods |
|------|--|---------------------|--------------------|
| 2.3 | Able to find equation of line and its slope and sketch the graph | | |

2. Assessment Tasks for Students

| # | Assessment task* | Week Due | Percentage of Total Assessment Score |
|---|---|----------|--------------------------------------|
| 1 | Mid Term Exam | 4 | 20% |
| 2 | Quiz | 3,7,10 | 15% |
| 3 | Continuous Assessment – Homework, Assignment, Attendance etc. | -- | 15% |
| 5 | End Semester Exam (50%) | 15 | 50% |

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

1. Exclusive Office Hours – 5 Hours per week
2. Academic Advising for Students

F. Learning Resources and Facilities

1. Learning Resources

| | |
|---------------------------------------|--|
| Required Textbooks | Howard Anton, "Calculus with analytical geometry", John Wiley & Sons, Last Edition. - Calculus - Student Solutions Manual by Dale Varberg, Edwin Purcell and Steve Rigdon ISBN10: 0131469665 , ISBN13: 9780131469662, Edition/Copyright: 9TH 07 (2007) |
| Essential References Materials | <ul style="list-style-type: none"> • - Calculus: Single Variable by Deborah Hughes-Hallett, ISBN10: 0470089156 , ISBN13: 9780470089156, Edition/Copyright: 5TH 09 (2009) |
| Electronic Materials | <ul style="list-style-type: none"> • Paul's online series on Calculus I |
| Other Learning Materials | <ul style="list-style-type: none"> • Lecture Notes of the Department of Mathematics |

2. Facilities Required

| Item | Resources |
|--|--|
| Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) | Classrooms with seating facilities for atleast 30 students |

| Item | Resources |
|--|---|
| Technology Resources (AV, data show, Smart Board, software, etc.) | <ul style="list-style-type: none"> • Providing classrooms with smart boards and data show • Teaching Resources Room |
| Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list) | N A |

G. Course Quality Evaluation

| Evaluation Areas/Issues | Evaluators | Evaluation Methods |
|--|--|---|
| Effectiveness of Teaching and assessment. | Students | Survey |
| Extent of achievement of course learning outcomes. | Developmental quality unit | Learning outcomes assessment. |
| Quality of learning resources Verifying standards of student achievement. | Developmental quality unit | Learning outcomes assessment. |
| Effectiveness of teaching. | Students | Survey |
| Extent of achievement of course learning outcomes. | Independent member teaching staff | Check marking by an independent member teaching staff of samples of student work. |
| Evaluation of the course file | Program quality and accreditation unit | Check and review the course file content. |

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

| | |
|----------------------------|----------------------------------|
| Council / Committee | Department Council Meeting No.13 |
| Reference No. | Item No.5 |
| Date | 05.02.2023 |