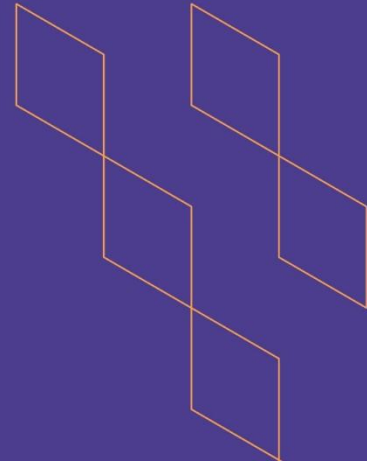




T-104  
2022

## Course Specification



Course Title:	Applied Calculus II
Course Code:	<b>Math112</b>
Program:	<b>All programs at the College of Business and Tourism</b>
Department:	<b>General Studies</b>
College:	<b>Deanship of Educational Services</b>
Institution:	<b>The University of Prince Mugrin (UPM)</b>
Version:	3
Last Revision Date:	4/10/2023



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## A. General information about the course:

Course Identification	
1. Credit hours:	3 credits
2. Course type	
a.	University <input type="checkbox"/> College <input checked="" type="checkbox"/> Department <input type="checkbox"/> Track <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: Level 2/First year	
4. Course general Description This course cover specific functions, and their applications as models (Linear, quadratic, rational, exponential, and logarithmic) as well as calculus: Limits, differentiation, business application of the derivative, introduction to integration and its applications including area. Functions of several variables, partial derivatives, and their business applications.	
5. Pre-requirements for this course (if any): Math 111	
6. Co- requirements for this course (if any): N/A	
<ul style="list-style-type: none"> <li>The basic knowledge of functions of single and several variables and their application in business.</li> <li>How to identify the concept of limits and differentiation of functions of single variable.</li> <li>How to apply differentiation and integration to business problems.</li> <li>How to identify partial derivatives of functions of several variables.</li> <li>How to apply partial differentiation to business problems.</li> </ul>	

### 1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	45	75%
2.	E-learning	15	25%
3.	Hybrid <ul style="list-style-type: none"> <li>Traditional classroom</li> <li>E-learning</li> </ul>		
4.	Distance learning		

### 2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	15
5.	Others (specify)	
	<b>Total</b>	<b>60</b>



## B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with ACCT / FIN program	Teaching Strategies	Assessment Methods
1.0	By the end of this course, students will be able to.....			
	Knowledge and understanding			
1.1	Define the concept of the linear and quadratic functions of single and several variables	ACCT PLO K2 FIN PLO K3	<ul style="list-style-type: none"> <li>Highlight keywords.</li> <li>List</li> <li>Memory activities</li> <li>Reading materials</li> <li>Watching presentations and videos</li> </ul>	<ul style="list-style-type: none"> <li>Fill in the blanks.</li> <li>Label</li> <li>Match</li> <li>Multiple choice</li> <li>Numerical problems</li> <li>True and false questions</li> </ul>
...				
2.0	Skills			
2.1	Apply the concept functions of several variables to business applications.	ACCT PLO S2	<ul style="list-style-type: none"> <li>Calculate</li> <li>Concept map</li> <li>Creating examples</li> <li>Demonstrations</li> <li>Flipped classroom.</li> <li>Gamification</li> <li>Group work</li> <li>Problem-solving tasks</li> <li>Short answers</li> </ul>	<ul style="list-style-type: none"> <li>E-portfolio</li> <li>Presentation</li> <li>Problem-solving tasks.</li> <li>Short answers</li> <li>Multiple choice</li> </ul>
2.2	Manipulate derivatives of functions of single and several variables.	ACCT PLO S2	<ul style="list-style-type: none"> <li>Calculate</li> <li>Case studies</li> <li>Concept map</li> <li>Creating examples</li> <li>Demonstrations</li> <li>Flipped classroom</li> <li>Gamification</li> <li>Group work</li> </ul>	<ul style="list-style-type: none"> <li>Discussion board post</li> <li>E-portfolio</li> <li>Presentation</li> <li>Problem-solving tasks.</li> <li>Short answers</li> <li>Multiple choice</li> </ul>



Code	Course Learning Outcomes	Code of CLOs aligned with ACCT / FIN program	Teaching Strategies	Assessment Methods
			<ul style="list-style-type: none"> <li>• Problem-solving tasks</li> <li>• Short answers</li> </ul>	
2.3	analyze business and economic models by using derivatives of functions.	ACCT PLO S2	<ul style="list-style-type: none"> <li>• Compare and contrast (with charts, tables, and Venn diagrams)</li> <li>• Concept map</li> <li>• Debates</li> <li>• Discussions</li> <li>• Flowchart</li> <li>• Graph</li> <li>• Group investigation</li> </ul>	<ul style="list-style-type: none"> <li>• Analysis paper</li> <li>• Case study</li> <li>• Evaluation criteria</li> <li>• Critique hypothesis, procedures, etc.</li> <li>• Problem-solving activities.</li> <li>• Multiple choice</li> </ul>
2.4	Solve business and economic problems using applications of integration	ACCT PLO S2	<ul style="list-style-type: none"> <li>• Calculate</li> <li>• Concept map</li> <li>• Creating examples</li> <li>• Demonstrations</li> <li>• Flipped classroom</li> <li>• Gamification</li> <li>• Group work</li> <li>• Problem-solving tasks</li> <li>• Short answers</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion board post</li> <li>• E-portfolio</li> <li>• Presentation</li> <li>• Problem-solving tasks.</li> <li>• Short answers</li> </ul>
2.5	Apply partial derivatives on optimization of financial problems.	ACCT PLO S2	<ul style="list-style-type: none"> <li>• Calculate</li> <li>• Concept map</li> <li>• Creating examples</li> <li>• Demonstrations</li> <li>• Flipped classroom</li> <li>• Gamification</li> <li>• Group work</li> <li>• Problem-solving tasks</li> <li>• Short answers</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion board post</li> <li>• E-portfolio</li> <li>• Presentation</li> <li>• Problem-solving tasks.</li> <li>• Short answers</li> </ul>
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate teamwork strategies	ACCT PLO V2 FIN PLO V2	<ul style="list-style-type: none"> <li>• Active participation in classroom activities</li> <li>• Brainstorm ideas</li> </ul>	<ul style="list-style-type: none"> <li>• follow procedures.</li> </ul>



Code	Course Learning Outcomes	Code of CLOs aligned with ACCT / FIN program	Teaching Strategies	Assessment Methods
	in collaborative activities		<ul style="list-style-type: none"> <li>Group discussions</li> <li>Present in front of an audience.</li> <li>Problem-solving activities</li> <li>Role-play</li> <li>Written assignments (essays, reports)</li> </ul>	<ul style="list-style-type: none"> <li>Critical questioning</li> <li>Feedback and peer evaluation</li> <li>Attendance</li> <li>Neatness and carefulness (with minimal errors) of submitted work</li> <li>Meet deadlines</li> <li>Rating scale</li> <li>Self-report (reflection).</li> </ul>
3.2				
...				

### C. Course Content

No	List of Topics	Contact Hours
1.	Specific Functions	4 (1 week)
2.	Limits and the Derivatives	8 (2 weeks)
3	Technique of derivatives and its business applications	12(3weeks)
4	Graphing and Optimization	8 (2 weeks)
5	Integration	8 (2 weeks)
6	Techniques of Integration and business applications	12 (3 weeks)
7	Multivariable Calculus	8 (2 weeks)
<b>Total</b>		<b>60</b>

### D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	3 <sup>rd</sup> ,6 <sup>th</sup> ,9 <sup>th</sup> ,12,15 <sup>th</sup>	15%





No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
2.	Homework	Every week	10%
3.	Class Work	Continues as assessment	10%
4.	Midterm Exam	8 <sup>th</sup> week	25%
5	Project	14	5%
6	Final Exam	16	35%
7	Total		100%

\*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

## E. Learning Resources and Facilities

### 1. References and Learning Resources

Essential References	Calculus for Business, Economics, Life Sciences, and Social Sciences, 12 <sup>th</sup> edition by Raymond A. Barnett, Michael R. Ziegler, and Karl E. Byleen.
Supportive References	
Electronic Materials	Calculator-Teams
Other Learning Materials	

### 2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms with 30 seats .
Technology equipment (projector, smart board, software)	Projector, Smart board, Teams
Other equipment (depending on the nature of the specialty)	





## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Survey (electronically)
Effectiveness of students assessment	Coordinator, Peer, Head of department	Direct: exams Indirect: survey
Quality of learning resources	Coordinator, Peer, Head of department	Direct: exams Indirect: survey
The extent to which CLOs have been achieved	Instructors, Head of department	Indirect: survey
Other		

**Assessor** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval Data

COUNCIL /COMMITTEE	GS COUNCIL MEETING
REFERENCE NO.	AY-2022-2023-NO.4
DATE	12/04/2023

