

Philadelphia University	 PHILADELPHIA UNIVERSITY <small>THE WAY TO THE FUTURE</small>	Approval date:
Faculty of Science		Issue:
Department of Math		Credit hours: 3
Academic year 2025/2026		Bachelor

Course information

Course#	Course title	Prerequisite
0250102	Calculus 2	Calculus 1
Course type		Class time
<input type="checkbox"/> University Requirement <input type="checkbox"/> Faculty Requirement <input checked="" type="checkbox"/> Major Requirement <input type="checkbox"/> Elective <input checked="" type="checkbox"/> Compulsory		2 ST 11:15-12:30
Degree / NQF Level	<input checked="" type="checkbox"/> Diploma degree (6) <input type="checkbox"/> Bachelor degree (7)	
	Room #	6606

Instructor Information

Name	Office No.	Phone No.	Office Hours	E-mail
Ahmad Hamdan	819	2341	SM 09:45 – 11:00 ST 09:45 – 11:00	ahamdan@philadelphia.edu.jo

Course Delivery Method

Course Delivery Method			
<input checked="" type="checkbox"/> Physical	<input type="checkbox"/> Online	<input type="checkbox"/> Blended	
Learning Model			
Precentage	Synchronous	Asynchronous	Physical
	0%	0%	100%

Course Description

This course introduces advanced principles of calculus to form the foundation needed for students' advancement. The module deals with the following main topics: Techniques of integration, Sequences and Series, Applications of the definite integral in geometry, science, and engineering, and possibly Polar Coordinates

Course Learning Outcomes

Number	Outcomes	Corresponding Program outcomes *
Knowledge		
K1	Students will learn advanced integration techniques, and study sequences and series for convergence.	K _p 1
Skills		
S1	Students will apply integration techniques and series analysis to solve complex problems, evaluating and selecting appropriate methods effectively.	S _p 2
Competencies		
C1	Students will develop the ability to communicate their mathematical reasoning and problem-solving processes effectively, both in writing and orally.	C _p 1

* According to learning outcomes of the faculty of pharmacy.

Learning Resources

Course textbook	<ul style="list-style-type: none"> Anton H., Bivens I., Davis S. (2016) Calculus: Early Transcendentals (11th ed.). Wiley.
Supporting References	<ul style="list-style-type: none"> Stewart J. (2015) Calculus: Early Transcendentals (8th ed.). Brooks Cole. Joel R. Hass, Christopher E. Heil, and Maurice D. Weir. (2017) Thomas' Calculus. (14th ed.). Pearson. Dennis G. Zill. (2009) Calculus: Early Transcendentals. (4th ed.). Jones and Bartlett. Ron Larson, Bruce H. Edwards. (2018) Calculus: Early Transcendental Functions. (7th ed.). Cengage Learning. Handouts by Feras Awad.
Supporting websites	<ul style="list-style-type: none"> GeoGebra: https://www.geogebra.org/
Teaching Environment	<input checked="" type="checkbox"/> Classroom <input type="checkbox"/> laboratory <input type="checkbox"/> Learning platform <input type="checkbox"/> Other

Meetings and Subjects Timetable

Week	Topic	Learning Methods	Tasks	Learning Material
1	Explanation of the study plan for the course, and what is expected to be accomplished by the students. Principles of Integral Evaluation 7.1 An Overview of Integration Methods	Lecture		Course Syllabus Chapter 7
2	7.2 Integration by Parts	Lecture		Chapter 7
3	7.3 Integrating Trigonometric Functions	Lecture		Chapter 7
4	7.4 Trigonometric Substitutions	Lecture	Quiz	Chapter 7
5	7.5 Integrating Rational Functions by Partial Fractions	Lecture		Chapter 7
6	7.8 Improper Integrals	Lecture		Chapter 7
7	Infinite Series 9.1 Sequences	Lecture	Quiz	Chapter 9
8	9.3 Infinite Series	Lecture	Midterm	Chapter 9
9	9.4 Convergence Tests 9.5 The Comparison, Ratio, and Root Tests	Lecture		Chapter 9
10	9.6 Alternating Series; Absolute and Conditional Convergence	Lecture		Chapter 9
11	9.8 Maclaurin and Taylor Series; Power Series 9.10 Differentiating and Integrating Power Series; Modeling with Taylor Series	Lecture	Quiz	Chapter 9
12	Applications of Definite Integral in Geometry, Science, and Engineering 6.1 Area Between Two Curves	Lecture		Chapter 6
13	6.2 Volumes by Slicing; Disks and Washers	Lecture		Chapter 6
14	6.3 Volumes by Cylindrical Shells 6.4 Length of a Plane Curve	Lecture		Chapter 6
15	6.5 Area of a Surface of Revolution	Lecture	Quiz	Chapter 6
16	Final Exam			

* Includes: Lecture, flipped Class, project-based learning, problem-solving based learning, collaborative learning

Course Contributing to Learner Skill Development

Using Technology
<ul style="list-style-type: none"> Students will use mathematical software (e.g., GeoGebra) to solve complex integration and series problems, enhancing their computational and analytical skills for academic and real-world applications.
Communication Skills
<ul style="list-style-type: none"> Group projects and discussions foster collaboration, communication, and teamwork skills
Application of Concepts Learnt
<ul style="list-style-type: none"> Students apply calculus to real-world problems, strengthening their problem-solving skills.

Assessment Methods and Grade Distribution

Assessment Methods	Grade Weight	Assessment Time (Week No.)	Link to Course Outcomes
Midterm Exam	30%	8	K1
Various Assessments *	30%	Continuous	S1, C1
Final Exam	40%	16	K1
Total	100%		

* Includes: quiz, in class and out of class assignment, presentations, reports, videotaped assignment, group or individual projects.

Alignment of Course Outcomes with Learning and Assessment Methods

Number	Learning Outcomes	Learning Method*	Assessment Method**
Knowledge			
K1	Students will learn advanced integration techniques, and study sequences and series for convergence.	Lecture	Exam
Skills			
S1	Students will apply integration techniques and series analysis to solve complex problems, evaluating and selecting appropriate methods effectively.	Lecture	Quiz
Competencies			
C1	Students will develop the ability to communicate their mathematical reasoning and problem-solving processes effectively, both in writing and orally.	Collaborative learning	Homework

* Includes: Lecture, flipped Class, project-based learning, problem-solving-based learning, collaborative learning

** Includes: quiz, in-class and out of class assignments, presentations, reports, videotaped assignments, group or individual projects.

Course Policies

Policy	Policy Requirements
Passing Grade	The minimum passing grade for the course is 50 % and the minimum final mark recorded on the transcript is 35%.
Missing Exams	<ul style="list-style-type: none"> Missing an exam without a valid excuse will result in a zero grade to be assigned to the exam or assessment. A Student who misses an exam or scheduled assessment, for a legitimate reason, must submit an official written excuse within a week of the exam or assessment due date. A student who has an excuse for missing a final exam should submit the excuse to the dean within three days of the missed exam date.

Attendance	The student is not allowed to be absent more than 15% of the total hours prescribed for the course, which equates to six lecture days (M, W) and six lectures (S, T). If the student misses more than 15 % of the total hours prescribed for the course without a satisfactory excuse accepted by the dean of the faculty, s/he will be prohibited from taking the final exam and the grade in that course is considered (zero), but if the absence is due to illness or a compulsive excuse accepted by the dean of the college, then withdrawal grade will be recorded.
Academic Honesty	Philadelphia University pays special attention to the issue of academic integrity, and the penalties stipulated in the university's instructions are applied to those who are proven to have committed an act that violates academic integrity, such as cheating, plagiarism (academic theft), collusion, and violating intellectual property rights.

Program Learning Outcomes to be Assessed in this Course

Number	Learning Outcome	Course Title	Assessment Method	Target Performance level
Sp2	The ability to employ mathematics in various life problems.	Calculus 2	Homework	100% of the students get 60% or more on the rubric.

Description of Program Learning Outcome Assessment Method

Number	Detailed Description of Assessment
Sp4	The student selects a real-life problem or scenario that requires mathematical analysis and provides a comprehensive solution.

Assessment Rubric of the Program Learning Outcome

	Excellent (4 pts) Student understands the concept perfectly.	Good (3 pts) Student is almost perfect in their understanding of the topic, with some minor confusion or mistakes.	Not Bad (2 pts) Student has a decent grasp of the process but makes some major mistakes.	Weak (1 pt.) Student is very confused and does not understand the topic, nor is able to clearly grasp how to apply it or when to use it.
Problem Selection	Relevant, complex, and mathematically rich problem chosen.	Relevant problem selected.	Basic problem with limited mathematical relevance.	Irrelevant or inappropriate problem chosen.
Problem Definition	Clear, thorough, and context-rich problem definition	Adequate problem definition with context.	Basic problem definition, lacking depth.	Unclear or inadequate problem definition.
Mathematical Analysis	Skillful application of appropriate mathematical concepts	Effective use of relevant mathematical concepts	Some mathematical concepts applied with limited depth.	Inaccurate or incomplete mathematical analysis.
Solution Clarity	Highly detailed, organized, and clear solution.	Clear and organized solution	Somewhat clear solution, lacking organization.	Unclear, disorganized, or incomplete solution.