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| **Approval date:** |  | **Philadelphia University** |
| **Issue:** | **Faculty of Science** |
| **Credit hours: 3** | **Department of Math** |
| **Bachelor** | **Course Syllabus** | **Academic year 2022/2023** |

**Course information**

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| **Prerequisite** | | **Course title** | | **Course#** |
| **None** | | **Calculus 1** | | **0250101** |
| **Room #** | **Class time** | | **Course type** | |
| 21009 | **Sun. and Tuesday**  **8:15-9:30**  **11:15-12:30** | | University Requirement  Faculty Requirement  Major Requirement  Elective  Compulsory | |

**Instructor Information**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E-mail** | **Office Hours** | **Phone No.** | **Office No.** | **Name** |
| **ralseidi@philadelphia.edu.jo** | **Sun. , Tuesday**  **10:00-11:00** | **009626479900/2340** | **1015** | Dr. Rola Alseidi |

**Course Delivery Method**

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| --- | --- | --- | --- |
| **Course Delivery Method** | | | |
| **Physical  Online  Blended** | | | |
| **Learning Model** | | | |
| **Physical** | **Asynchronous** | **Synchronous** | **Precentage** |
| **100%** | **0%** | **0%** |

**Course Description**

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| This is a first-year course which covers the following main concepts and topics: Functions: domain, operations, graphs, trigonometric functions, transcendental, functions, inverse functions, logarithms and exponentials, inverse trigonometric functions. Limits: definition, rules, infinite limits and limits at infinity, continuity, continuity of trigonometric functions, Derivative: rules, derivative of trigonometric functions, chain rule, implicit differentiation, Roll’s theorem, mean-value-theorem, L’Hopital’s rule, increasing and decreasing, extreme values, asymptotes. Integration: anti-derivative, definite and indefinite integrals, fundamental theorem of calculus, area under the curve, area between tow curves. |

**Course Learning Outcomes**

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| **Corresponding Program outcomes \*** | **Outcomes** | **Number** |
| **Knowledge** | | |
| **K­p1** | Understand the basic properties of algebraic and transcendental functions, and their operations. | **K1** |
| **K­p1** | Know the concepts of limits and continuity. | **K2** |
| **K­p1** | Understand the definition of derivative and integral, and how to differentiation and integration elementary functions. | **K3** |
| **Skills** | | |
| **S­p2** | Students should be able to use derivatives and integrals to solve real-life problems. | **S1** |
| **Competencies** | | |
| **C­p1** | Thinking reasonably and the ability to make decisions. | **C1** |
| **C­p2** | Work in a team to implement one of the tasks of the course. | **C2** |

\* According to learning outcomes of the faculty of pharmacy.

**Learning Resources**

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| * Anton H., Bivens I., Davis S. (2011) Calculus: Early Transcendentals (10th ed.). Wiley. | **Course textbook** |
| * Stewart J. (2015) Calculus: Early Transcendentals (8th ed.). Brooks Cole. | **Supporting References** |
|  | **Supporting websites** |
| **Classroom**  **laboratory Learning platform Other** | **Teaching Environment** |

**Meetings and Subjects Timetable**

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| --- | --- | --- | --- | --- |
| **Learning Material** | **Tasks** | **Learning Methods** | **Topic** | **Week** |
| Course Syllabus  **Sec 0.1:**  7,8,9,10 |  | Lecture | Explanation of the study plan for the course, and what is expected to be accomplished by the students.  **Technology Preliminaries:**  Moodle. Microsoft Teams.  **BEFORE CALCULUS (Ch. 0):**  0.1 Functions | **1** |
| **Sec 0.2:**  5,7,9,11,13,15,27,29,30,31,33 |  | Lecture | 0.2 New Functions from Old | **2** |
| **Sec 0.4:**  1,3,9,10,11,17,27,28 |  | Lecture | 0.4 Inverse Functions; Inverse Trigonometric Functions | **3** |
| **Sec 0.5:**  1,3,5,9,11,16,28,  20,22,23,24,26,28 | Quiz (10 points)  26/3/2023 | Lecture | 0.5 Exponential and Logarithmic Functions | **4** |
| **Sec 1.2:**  1,3,6,7,11,13,25,28,30,31,37,40  **Sec 1.3:**  9,13,15,19,23,25,27,29,31,35,37 |  | Lecture | **LIMITS AND CONTINUITY (Ch. 1):**  1.1 Limits (An Intuitive Approach)  1.2 Computing Limits  1.3 Limits at Infinity; End Behavior of a Function | **5** |
| **Sec 1.5:**  5,11,13,15,19,21  **Sec 1.6:**  1,3,5917,19,21,23,27,31,33,40 |  | Lecture | 1.5 Continuity  1.6 Continuity of Trig., Exp., Inverse functions. | **6** |
| **Sec 2.1:**  5,11,13,15,19,21  **Sec 2.3:**  1,3,5,7,9,11,13,17,41,43  **Sec 2.4:**  5,7,9,11,13,15,19 |  | Lecture | **THE DERIVATIVE (Ch. 2):**  2.1 Tangent Lines and Rates of Change  2.2 The Derivative Function  2.3 Introduction to Techniques of Differentiation  2.4 The Product and Quotient Rules | **7** |
| **Sec 2.5:**  1,3,5,7,9,11,13,19,21,23,25,27  **Sec 2.6:**  7,9,11,13,15,17,  19,27,2943,44,45,51 | Quiz (10 points) 16/04/2023 | Lecture | 2.5 Derivatives of Trigonometric Functions  2.6 The Chain Rule. | **8** |
| **Sec 3.1:**  3,5,7,9,11,13,15,  17  **Sec 3.2:**  1,3,5,7,9,11,13,15,17,19,21,35,37,39 |  | Lecture | **TOPICS IN DIFFERENTIATION (Ch. 3):**  3.1 Implicit Differentiation  3.2 Derivatives of Logarithmic Functions | **9** |
| **Sec 3.3:**  7,9,10,15,17,21,  27,37,39,34,45,47  **Sec 3.6:**  7,9,11,13,15,23,29,31,33,37,39,41 |  | Lecture | 3.3 Derivatives of Exp. and Inverse Trig. Functions  3.6 L'Hopital's Rule; Indeterminate Forms | **10** |
| **Sec 4.1:**  15,17,19,21,23,25,33,35,39  **Sec 4.2:**  25,27,29,31,37,4164  **Sec 4.4:**  21,23,25,27  **Sec 4.8:**  1,3,5,9 |  | Lecture | **THE DERIVATIVE IN GRAPHING AND**  **APPLICATIONS (Ch. 4):**  4.1 Increase, Decrease, and Concavity  4.2 Relative Extrema; Graphing Polynomials  4.4 Absolute Maxima and Minima  4.8 Rolle's Theorem; Mean-Value Theorem | **11** |
| **Sec 5.2:**  5,9,11,13,15,43  **Sec 5.3:**  1,3,7,15,19,23,27,29,33,35,39,57 |  | Lecture | **INTEGRATION (Ch. 5):**  5.2 The Indefinite Integral  5.3 Integration by Substitution | **12** |
| **Sec 5.5:**  13,15,17,21  **Sec 5.6:**  13, 15,19,21,23,25,2731,59,61,63  **Sec 5.9:**  5,7,9,11,1319,21 |  | Lecture | 5.5 The Definite Integral  5.6 The Fundamental Theorem of Calculus  5.9 Evaluating Definite Integrals by Substitution | **13** |
| **Sec 5.10:**  3,11,13,15 | Assignment 21/05/2023 | Lecture | 5.10 Logarithmic and Other Functions Defined by Integrals | **14** |
|  |  |  | Review and Final Exam | **15** |

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

**Course Contributing to Learner Skill Development**

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| **Using Technology** |
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| **Communication Skills** |
| Improve the communication skills of the student by giving oral quizzes and discuss the assignments at the class |
| **Application of Concepts Learnt** |
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**Assessment Methods and Grade Distribution**

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| --- | --- | --- | --- |
| **Link to Course Outcomes** | **Assessment Time**  **(Week No.)** | **Grade Weight** | **Assessment Methods** |
| **K1, K2, C1** | **8** | **30 %** | **Mid Term Exam** |
| **S1, S2, C1, C2** | **Continuous** | **30 %** | **Various Assessments \*** |
| **K1, K2, K3, C1** | **15** | **40 %** | **Final Exam** |
|  |  | **100%** | **Total** |

\* 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**

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| --- | --- | --- | --- |
| **Assessment Method\*\*** | **Learning Method\*** | **Learning Outcomes** | **Number** |
| **Knowledge** | | | |
| **Exam** | Lecture | Understand the basic properties of algebraic and transcendental functions, and their operations. | **K1** |
| **Quiz** | Lecture | Know the concepts of limits and continuity. | **K2** |
| **Exam** | Lecture | Understand the definition of derivative and integral, and how to differentiation and integration elementary functions. | **K3** |
| **Skills** | | | |
| **Assignment** | Problem Solving | Students should be able to use derivatives and integrals to solve real-life problems involving optimization and areas. | **S1** |
| **Competencies** | | | |
| **Assignment** | Discussion | Thinking reasonably and the ability to make decisions. | **C1** |

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

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

**Course Polices**

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| --- | --- |
| **Policy Requirements** | **Policy** |
| The minimum passing grade for the course is (50%) and the minimum final mark recorded on transcript is (35%). | **Passing Grade** |
| * 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 from an 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. | **Missing Exams** |
| The student is not allowed to be absent more than (15%) of the total hours prescribed for the course, which equates to six lectures 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. | **Attendance** |
| 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. | **Academic Honesty** |

**Program Learning Outcomes to be Assessed in this Course**

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| **Target Performance level** | **Assessment Method** | **Course Title** | **Learning Outcome** | **Number** |
| 75% of the students have a degree above 8/10 | Quizes | Calculus 1 | Understanding the main concepts | Kp1 |
| 100% of the students have a degree above 8/10 | Assignment | Calculus 1 | use derivatives and integrals to solve real-life problems. | Sp2 |

**Description of Program Learning Outcome Assessment Method**

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| --- | --- |
| **Detailed Description of Assessment** | **Number** |
| Short quizzes mainly (2) with 10 points each | **Kp1** |
| Assignment with 10 points | Sp2 |

**Assessment Rubric of the Program Learning Outcome**

**Construct during the course.**