Prince Sultan University

Department of General Sciences/Deanship of Educational Services

2nd Semester 2018-2019

INSTITUTIONAL COURSE SYLLABUS TEMPLATE

Course Code: MATH 111	Course Title: Calculus I
Course Instructor: Dr. Faculty Member	Email:
Credit Hours: 3	Lectures: SMTW
Office Hours:	
Office:	

Mission Statement of General Courses Department:

The mission statement of General Courses Department is to provide students with diverse educational opportunities by delivering high quality courses in social, health, and physical sciences that help students develop intellectual hard skills in these domains and interpersonal and transferable soft skills, such as critical thinking and analytical, management and communication skills. These capacities will empower students to achieve success across the academic programs at Prince Sultan University, to gain professional competencies for the workplace, as well as to become multi-talented and valuable community members of the society.

I. Course Description: This course is designed to develop the topics of differential calculus. Emphasis is placed on limits, continuity and derivatives of algebraic and transcendental functions of one variable. The goal of this course is developing the student's geometric insight into the concepts of differentiation, and applying these concepts to problem solving and "real world application".

II. Course Learning Outcomes:

Skills	Course Learning Outcomes	Measured by
Knowledge (Recall& Use)		
Cognitive Skills	CLO1: Calculate the limit of a function using appropriate techniques including L'Hopital's rule (ILO 3, ILO 7) CLO2: Compute the derivative of functions by applying the rules of differentiation. (ILO 3, ILO 4) CLO3: Determine whether a function is continuous and/or differentiable (ILO 7) CLO5: Apply the concept of differentiation to sketch the graph of a function in a systematic way. (ILO 3) CLO6: Solve various real word problems using calculus concepts. (ILO 7)	On line Homework Quizzes Major Exams Final Exam

Interpersonal Skills and Responsibility	CLO4: Find extreme values of functions. (ILO 6)	On line Homework Quizzes Major Exams Final Exam
Numerical & Communication Skills		
Affective Interpersonal		

III. Course Content (Specific course topics to be covered within the semester).

Topics Covered	# of weeks	Actual Contact Hours
1.1 Four Ways to Represent a Function 1.2 Mathematical Models: A Catalog of Essential Functions	1	4
1.3 New Functions from Old Functions 1.4 Exponential Functions	1	4
1.5 Inverse Functions and Logarithms	0.5	2
2.2 The Limit of a Function 2.3 Calculating Limits using the Limit Laws 2.5 Continuity	1.5	6
2.6 Limits at Infinity; Horizontal Asymptotes 2.7 Derivatives and Rate of Change	1	4
2.8 The Derivative as a Function 3.1 Derivative of Polynomials and Exponential Functions	1	4
3.2 The Product and Quotient Rules	1	4
3.3 Derivatives of Trigonometric Functions 3.4 The Chain Rule	1	4
3.5 Implicit Differentiation	1	4
3.6 Derivatives of Logarithmic Functions 3.9 Related Rates	1.5	6
3.11 Hyperbolic Functions	0.5	2
4.1 Maximum and Minimum Values 4.2 The Mean Value Theorem	1	4
4.3 How Derivatives affect the Shape of a Graph	0.5	2
4.4 Indeterminate Forms and L'Hopital's Rule 4.5 Summary of Curve Sketching	1.5	6
4.7 Optimization	1	4

IV. Course Components

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Department of Mathematics & General Sciences webpage: **http://info.psu.edu.sa/psu/maths/**

Week #	Date	Text Sections	Topic
1	January 06 – 10	1.1 1.2	Four Ways to Represent a Function Mathematical Models: A Catalog of Essential Functions
2	January 13 – 17	1.3 1.4	New Functions from Old Functions Exponential Functions
3	January 20 – 24	1.5 2.2	Inverse Functions and Logarithms The Limit of a Function
4	January 27 – 31	2.3 2.5	Calculating Limits using the Limit Laws Continuity
5	February 03 –07	2.6 2.7	Limits at Infinity; Horizontal Asymptotes Derivatives and Rate of Change
6	February 10 – 15	2.8 3.1	The Derivative as a Function Derivative of Polynomials and Exponential Functions
7	February 17 – 21	3.2 3.3	The Product and Quotient Rules Derivatives of Trigonometric Functions
	Sunday - February 17 2019, Major I Exam {Ch.1 and Ch.2}		
8	February 24 – 28	3.4	The Chain Rule
9	March 03 – 07	3.5	Implicit Differentiation
07 Mar. 2019, Last day for dropping one or more courses with grade of "W" through registrar's office			
10	March 10 – 14	3.6 3.9	Derivatives of Logarithmic Functions Related Rates
14March 2019, Last day for dropping the semester with grade of "W" through registrar's office			
11	March 17 – 21	3.9 3.11	Related Rates Hyperbolic Functions
12	March 24 – 28	4.1 4.2	Maximum and Minimum Values The Mean Value Theorem
	Sunday - 24 March 2019, Major II Exam {Ch.3}		
13	March 31 – April 04	4.3 4.4	How Derivatives affect the Shape of a Graph Indeterminate Forms and L'Hopital's Rule
14	April 07 – 11	4.4 4.5	Indeterminate Forms and L'Hopital's Rule Summary of Curve Sketching
11 Apr. 2019, Last day for withdrawal from all courses with grade of "WP/WF" through registrar's office			
15	April 14 – 18	4.7	Optimization

Component	Contact Hours
Lecture	45
Tutorial	15
Practical/Field	0

V. Teaching Strategies

Domain	Strategy
Knowledge	Lectures, Concept presentation.
Cognitive Skills	Examples presented in class.
Interpersonal Skills & Responsibility	Examples presented in class.
Numerical & Communication Skills	Examples presented in class.

VI. Course Requirements: Two major exams; 5-7 quizzes; 5 on-line assignments; project or flipped classroom activity; Attendance & class participation**.**

VII. Student Assessment

A. Assessment Task

Domain	Assessment Task
Knowledge	Major, Quizzes, Assignments
Cognitive Skills	Major, Quizzes, Assignments
Interpersonal Skills & Responsibility	Major, Quizzes, Assignments
Numerical & Communication Skills	Class participation; Project or flipped classroom activity

B. Schedule of Assessment

Assessment	Assessment Task	Week Due	Proportion of Final Assessment
1	Major I	Week # 7	20%
2	Major II	Week # 13	20%
3	Quizzes	Throughout the semester: Week # 3; 5; 9; 11, 14	10%
4	Assignments	Throughout the semester: 4; 6; 8; 10; 12	5%
5	Class participation & Attendance	Throughout the semester	2.5%
6	Project or flipped classroom activity	TBA	2.5%

VIII. Learning Resources:

Textbook: Calculus: Early Transcendental Functions. 8th edition By Stewart

A. References:

1. Calculus: The language of Change: David W. Cohen and James M. Henle
2. Calculus: William L. Briggs, Lyle Cochran

B. Facilities required - lecture room, with a projector.

C. Learning Management System: Moodle + www.webassign.net

Department of Mathematics & General Sciences: **http://info.psu.edu.sa/psu/maths/**

Calculators:

Scientific Calculators are required in this course. Graphing Calculators are not allowed.

Quizzes & Exams:

- Quizzes will be given during the class covering the materials discussed during the previous lectures.
- If you absent or late, then you will get a **zero** for the quiz. **No** make up for quizzes.
- You are expected to show your presence in class through meaningful discussion and positive participation. You are encouraged to ask questions whenever needed.
- Quizzes count for 10% of your total class work.
- If you miss any major exam due to a severed medical emergency, the department may offer you a make-up exam provided you bring a valid medical excuse from a governmental hospital within only one week from the date of the major exam. **After one week no** excuses will be accepted and no make-up exam will be offered.

Homework:
Homework will be solved online using the web assign account. Each student should create an account and use the class key to enroll in the class to be able to solve the homework.

Office Hours:
Check the table posted on your teacher's door for the office hours in case you need assistance or you need to inquire about matters concerning your marks, absence, and so on.

Classroom Policies:

A. Academic Integrity Policy (e.g. plagiarism or dishonesty)

Plagiarism can be defined as unintentionally or deliberately using another person's writing or ideas as though they are one's own. Plagiarism includes, but is not limited to, copying another individual's work and taking credit for it, paraphrasing information from a source without proper documentation, and mixing one's own words with those of another author without attribution. In addition, buying a paper or project, or downloading a paper from the Internet, and submitting them as your own are also plagiarism. The penalty for academic dishonesty will bring course expulsion and failure, or even suspension.

B. Attendance Policy

- Students are required to attend all classes starting from **the first day of the semester**.
- Attendance will be taken at the start of the lecture. If the student enters the classroom **after 10 minutes,** he will be marked absent.
- **2.5 points** will be assigned to the attendance. **Half a point will be deducted** from the student's total grade for every one absence **after** missing 3 classes.
- "**DN Grade**" will be issued to a student who **misses 16 classes**. This means he cannot enter any more classes or exams. **(1st warning: 6 absence ; 2nd warning: 11 absences)**

C. Homework Submission Policy

- There is an online tool "**Webassign**" which is a very helpful tool that should improve your performance in the course with all the helping features available. Your instructor will give you all the details about registering and using it.
- **Online Homework** will be given during the term using Webassign. A deadline for submitting each homework will be determined by your instructor. **5 points** will be assigned to the Homework. An **Access Code** for registering for the online homework is either attached with the book or can be purchased online from **Cengage Learning.**
- It is the **sole responsibility** of the student to ensure that he has the Access Code and completed the homework before the stated deadlines.
- Please note that after the deadlines have passed, homework **will not** be opened for any reason whatsoever.

Tips on how to enhance your problem-solving abilities:

- Attend all classes.
- Do all the homework assignments on time. It is impossible to understand math without solving problems.
- You are urged to practice (but not memorize) more problems than the ones assigned.
- You should always try to solve a problem on your own before reading the solution or asking for help.
- If you find it difficult to handle a certain type of problems, you should try more problems of that type.
- You are encouraged to solve some of the review problems at the end of each chapter.
- The practice you get doing homework and reviewing the class lectures will make exam problems easier and quicker to solve.
- Make good use of the office hours.

Tips on how to be successful in Calculus I (Math 111)

It is expected that you should:

1. Attend all classes, pay attention, and do not hesitate to ask questions;
2. Spend about 12 hours each week working homework suggested problems, reviewing the class lectures, reading the text book, and studying for quizzes and exams;
3. Try to solve problems on your own before reading solutions or asking for help.
4. Consult your instructor immediately when you face a continuous difficulty in the course;
5. Complete all homework suggested problems every week, check the correctness of your work and understand the methods and principles they illustrated;
6. Master the designed course topics before each quiz and exam, and if necessary, complete additional problems beyond those assigned and consult other sources if you find the assigned problems and text are insufficient;
7. Write your solutions to homework, exams, and quizzes problems in an organized way;
8. If you find it difficult to handle a certain type of problems, you should try more problems of that type.

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SECTION	PAGE	SUGGESTED PRACTICE PROBLEMS
1.1	19	25,27,28,29,30,31,34,35,37,41,44,46,47,52,57,58,60,61,74,76
1.2	33	5,6,11,15
1.3	42	4,5,11,12,13,17,35,37,38,41
1.4	53	4,9,15,19,20
1.5	66	9,10,22,24,25,26,41,53
2.2	92	4,7,11,18,33,36,40,43
2.3	102	2,6,8,9,15,18,19,21,25,30,32,37,40,41,44,50,52,59
2.5	124	11,12,16,19,20,22,25,30,38,42,45,46,53,55
2.6	137	4,8,9,14,19,20,25,27,30,35,38,40,41,44,49,50,52,63
2.7	148	5,7,20,21,22,24,33,34,37,39,42,59,60
2.8	160	2,3,21,24,26,29,30,41,44,59,61
3.1	180	3,13,15,18,23,27,33,35,45,55,54,56,59,61,67,70,75
3.2	188	3,7,10,12,15,20,24,27,29,30,31,33,34, 41,42,43,45,46,48,54
3.3	196	3,6,9,12,15,21,22,24,29,30,33,34,39,41,43,46,47,50,52
3.4	204	9,17,18,21,25,26,29,31,36,37,40,45,46,49,50,51,54,60,61,62,73,74
3.5	215	4,7,12,15,16,17,19,20,21,22,23,26,28,29,35,36,37,39,40, 49,50,51
3.6	223	2,11,19,22,26,27,29,32,33,41,45,48,50,54
3.9	249	3,4,5,6,10,12,14,16,17,19,23,33
3.11	264	7,11,14,17,19,23,30,34,35,46
4.1	283	5,6,15,17,21,25,27,28,33,34,35,38,43,44,47,49,52,54,56,60,61,62
4.2	291	5,8,11,12,14,20
4.3	300	1,9,11,15,17,19,21,24,25,27,37,39,41,45,48,49,51,52
4.4	311	8,12,13,17,19,26,27,29,31,35,40,47,51,53,55,56,59,64,65,67,68
4.5	321	1,2,5,9,13,18,21,27,30,45,51,52,53,54
4.7	336	2,3,4,5,6,13,14,15,16,21,22,23,25

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