

Course Specification
(CS)
Differentiation Calculus (150 Math-4)
1st 1438-1439 H

Course Specifications

Institution: Najran University	Date of Report: 27/12/1438H
College/Department : Deanship of Preparatory Year / Department of Mathematic Skills	

A. Course Identification and General Information

1. Course title and code: Differentiation Calculus (150 Math-4)			
2. Credit hours: 4 Hours			
3. Program(s) in which the course is offered. Preparatory Year Program			
4. Name of faculty member responsible for the course: Dr.Akram A. M.Naj Dr. Khaled Ibrahim A. Adam Dr . Sulima Mohammed Awad			
5. Level/year at which this course is offered: Level 2			
6. Pre-requisites for this course (if any) : --			
7. Co-requisites for this course (if any) : --			
8. Location if not on main campus: Main Campus, Faculty of Computer Sciences (boys) PY-building (girls) -			
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	<input type="checkbox"/>	What percentage?	<input type="checkbox"/>
b. Blended (traditional and online)	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="70"/>
c. e-learning	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="30"/>
d. Correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>
f. Other	<input type="checkbox"/>	What percentage?	<input type="text"/>
Comments:			

B. Objectives

1. What is the main purpose for this course? Students are expected to have strong and sound understanding of the differentiation calculus in term of its concepts, techniques and theorems. Students are expected to apply them on studying the behavior of a function.
2. Briefly describe any plans for developing and improving the course that being implemented. <ul style="list-style-type: none"> - Self-study (lecture videos) - Online Books and Lecture Notes - Sites with Calculus Exams - Blackboard (eLearning) - Use Mathematical software as Wolfram Mathematica

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

Course Description:

This course is designed to cover topics in the Differential Calculus. It includes limits and continuity, derivatives, and applications of derivatives. The types of functions studied include algebraic, trigonometric, exponential and logarithmic. During the semester students will learn to recognize and express the mathematical ideas graphically, numerically, symbolically, and in writing.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
Chapter 1: Limits and Continuity		
1.1 Concept of Limit	1	5
1.2 Computation of Limit		
1.3 Infinite Limit	1	5
1.4 Limits at Infinity	1	5
1.5 Continuity and Consequences		
1.6 Limits of Trigonometric Functions	1	5
Chapter 2: Differentiation		
2.1 The Derivative	1	5
2.2 The Derivative Computation of Derivatives	1	5
2.3 The Chain Rule	1	5

2.4 Derivative of Trigonometric Functions	1	5
2.6 Derivatives of Logarithmic and Exponential Functions	1	5
2.7 Implicit Differentiation	1	5
2.8 The Mean Value Theorem	1	5
Chapter 3: Applications of Differentiation		
3.1 Indeterminate Forms and L'Hopital's Rule	1	5
3.2 Monotonic Behavior of Functions		
3.4 Absolute Extrema	1	5
3.3 Concavity and Inflection Points	1	5

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	5					75 hours
Credit	4					4
3. Additional private study/learning hours expected for students per week.				12 hours		

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Define the limit and the continuity of functions, and its derivatives on the real numbers system	Lecture Cooperative learning Problem solving Brain storming Self-Learning. <i>eLearning</i>	First exam Second Exam Final Exam
2.0	Cognitive Skills:		
2.1	Evaluate the limits of a function, as x approaches any real number a .	Lecture Cooperative learning	First exam Second Exam

2.2	Determine where a function is either continuous or not at a point or on the interval.	Problem solving Brain storming Self-Learning <i>eLearning</i>	Final Exam
2.3	Find the derivative of functions (in 1 st degree, or high degree)		
2.4	Apply the derivative of functions for studying the behavior of functions and sketching their curve.		
3.0	Interpersonal Skills & Responsibility:		
3.1	N.A		
4.0	Communication, Information Technology, Numerical:		
4.1	N.A		

5. Schedule of Assessment Tasks for Students During the Semester			
Assessment task		Week Due	Proportion of Total Assessment
1	Midterm Exam	Fifth week	30
2	Homework	Eleventh week	10
4	Final Exam	Eighteenth week	60
Total			100%

D. Student Academic Counseling and Support :

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- **Students communicate with the instructors at any times other than the office hour via Blackboard and social media (Whatsapp)**

E. Learning Resources : مصادر التعلم

1. List Required Textbooks

- Calculus Made Simple, A. H. Khashan, S. T. Obeidat and, K. H. Khashan, The King Saud University, 2nd Edition Year: 2014.

2. List Essential References Materials

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Swokowski, Calculus: The Classic Edition, 1986.
- Swokowski, Calculus with Analytic geometry, 1983.
- Calculus Early Transcendental Single Variable, H. Anton, I. Bivens, S. Davis, Wiley & Sons, 2008.
- Calculus - One Variable, Early Transcendental, Salas, Wiley, 1996.

4. List Electronic Materials

Title	Link
Calculus Made Easy	http://djm.cc/library/Calculus_Made_Easy_Thompson.pdf
Calculus I (Paul Dawkins)	http://tutorial.math.lamar.edu/Classes/CalcI/CalcI.aspx
Karl's Calculus Tutor	http://www.karlscalculus.org/calculus.html
Calculus Refresher, version 2008.4	http://www.math.umn.edu/~garrett/calculus/first_year/notes.pdf
Calculus I Notes	http://tutorial.math.lamar.edu/Classes/CalcI/CalcI.aspx
A Calculus Refresher	http://www.mathcentre.ac.uk/resources/exercisebooks/mathcentre/final0502-calc-ref-ukmlsc.pdf
BASIC CALCULUS REFRESHER	http://www.stat.wisc.edu/~ifischer/calculus.pdf
First Year Calculus (Chen W.W.L)	http://rutherglen.ics.mq.edu.au/wchen/lnfycfolder/fyc06.pdf
Notes on Calculus (Ikenaga B)	http://marauder.millersville.edu/~bikenaga/calculus/calculusnotes.html
Calculus (Strang G)	http://ocw.mit.edu/OcwWeb/resources/RES-18-001Spring-2005/Textbook/index.htm
Calculus Unlimited	http://caltechbook.library.caltech.edu/197/
A Summary of Calculus	http://www.math.hawaii.edu/~heiner/short.pdf
Elementary Calculus An Approach Using Infinitesimals(Keisler H.J)	http://www.math.wisc.edu/~keisler/chapter_2.pdf
Pre calculus I and II	http://www.openmathtext.org/lecture_notes/david_santos_precalculus.pdf
First-Year Calculus Notes	http://www.math.umn.edu/~garrett/calculus/first_year/notes.pdf

Calculus notes and solutions	http://math.kennesaw.edu/~sellerme/sfehtml/classes/math1190/math1190.html
<ul style="list-style-type: none"> • http://www.understandingcalculus.com/ • http://www.math.temple.edu/~cow/ • http://www.onlinemathlearning.com/calculus-help.html • http://www.mastermathmentor.com/calc/abexams.ashx • http://www.math.hmc.edu/calculus/tutorials/ • http://archives.math.utk.edu/visual.calculus/index.html • http://www.sosmath.com/calculus/calculus.html • http://tutorial.math.lamar.edu/Classes/CalcI/CalcI.aspx • http://www.calculus-help.com/tutorials/ • http://www.analyzemath.com/calculus.html 	
<p>5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.</p> <ul style="list-style-type: none"> • Wolfarm Mathematica 8.0 	

F. Facilities Required :

Indicate requirements for the course including size of classrooms and laboratories
<p>1. Accommodation</p> <ul style="list-style-type: none"> • A class Room appropriate for 25 students with Data Show and Smart Board.
<p>2. Computing resources (AV, data show, Smart Board, software, etc.)</p> <ul style="list-style-type: none"> • One computer in each classroom which connected to the Internet • Data show • Smart board
3. Other resources

G Course Evaluation and Improvement Processes :

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
<ul style="list-style-type: none"> • An open questionnaire is carried out at the end of the year to get the students' feedback about the points of

<p>strength and weakness in the course.</p> <ul style="list-style-type: none"> • Statistical data will be made about the students' results of each exam. • Self-assessment • The college and department follow up on the teaching process. • Open dialogue with the students to get their feedback on how the course succeeded on achieving its goals(Students' conference)
<p>2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor</p> <ul style="list-style-type: none"> • Students evaluate the course electronically at the end of the year • Evaluating the performance of the students' home assignments and worksheets
<p>3 Processes for Improvement of Teaching</p> <ul style="list-style-type: none"> • Attending the relevant training courses to the topics of the course • Attending workshops to facilitate sharing experience among the teaching staff • Preparing a schedule for meetings for the colleagues to discuss some issues and find solutions to them • Encouraging teaching staff to attend professional development conferences in their specialization
<p>4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)</p> <ul style="list-style-type: none"> • The students' answer sheets are checked and marked • The answer sheets are rechecked and filtered by another colleague(different from the first Marker) • Choosing another random sample for a second revision and checking to insure the accuracy of marking and revision • Putting the marks on the answer sheets • Revising the papers and marks for another time on the answer sheets then writing marks in lists then uploading them on the computer and comparing the results with the original answer sheets of the students • If the students objects to the mark he got ,he can compare his paper with those who higher marks • Comparing marks from section to section • Comparing between the students' results of the Boys college with that of the Girls college
<p>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</p> <ul style="list-style-type: none"> • Comparison of the syllabuses and course specification in other universities • Comparing the objectives of the course with the degree of the benefit the students achieved • Coordination with teachers from other universities to benefit from their special experience in developing the course • Holding a discussion among the teaching staff members (Boys – Girls) to give their opinions on the course

- Developing the scientific material by adding the most up to - date versions and excluding the old ones.

Name of Course Instructor: يذكر هنا اسم القائمين بتدريس المقرر
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