

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

**Course Specifications
(CS)**

Course Specifications

Institution Najran University	Date of Report
College/Department : Faculty of Art and Science /Computer Science Department	

A. Course Identification and General Information

1. Course title and code: Title: Calculus Code: 202MATH-3 (٢٠٢ ريض-٣)			
2. Credit hours : (3)			
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs)			
4. Name of faculty member responsible for the course Dr. Mohammed Mady Bard			
5. Level/year at which this course is offered: Level 2/ First Year			
6. Pre-requisites for this course (if any) 100 MATH-3 (General Math)			
7. Co-requisites for this course (if any) None			
8. Location if not on main campus Male and Female Branches			
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="100%"/>
b. Blended (traditional and online)	<input type="checkbox"/>	What percentage?	<input type="text"/>
c. e-learning	<input type="checkbox"/>	What percentage?	<input type="text"/>
d. Correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>
f. Other	<input type="checkbox"/>	What percentage?	<input type="text"/>
Comments: We still teach this course using traditional methods but there is a plan to transform all course into electronic format using E-learning			

B Objectives

1. What is the main purpose for this course?
1) Memorize fundamental concepts in calculus
2) Use mathematical rules in solving problems in calculus and differential equations

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

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

Domain and range of a function. Some types of Functions. Basic Theorems on limits. Continuity : Continuity at a point, continuity on an interval, theorems of continuity. Definition and Existence of Derivative of Function. Rules of differentiation. Higher derivatives. Integration of a function. Definite and indefinite Integrals of functions. Integration Methods. Differential equations of first order and second order. Sequences. Series. Power series.

1. Topics to be Covered						
List of Topics				No. of Weeks	Contact Hours	
Determine Domain and range of a function. How to draw a graph of a function. Know some types of Functions				2	6	
Limits : Basic Theorems on limits .				1	3	
Continuity : Continuity at a point, continuity on an interval, theorems of continuity .				2	6	
Definition and Existence of Derivative of Function .				1	3	
Rules of differentiation. Higher derivatives				2	6	
Concept of integration of a function.				1	3	
Definite and indefinite Integrals of functions				2	6	
Integration Methods				2	6	
Differential equations of first order and second order .				2	6	
2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	45					45
Credit	45					45

3. Additional private study/learning hours expected for students per week. Office hours: 2 Hours

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

Course Learning Outcomes, Assessment Methods, and Teaching Strategy work together and are aligned. They are joined together as one, coherent, unity that collectively articulate a consistent agreement between student learning, assessment, and teaching.

The **National Qualification Framework** provides five learning domains. Course learning outcomes are required. Normally a course has should not exceed eight learning outcomes which align with one or more of the five learning domains. Some courses have one or more program learning outcomes integrated into the course learning outcomes to demonstrate program learning outcome alignment. The program learning outcome matrix map identifies which program learning outcomes are incorporated into specific courses.

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. **Fourth**, if any program learning outcomes are included in the course learning outcomes, place the @ symbol next to it.

Every course is not required to include learning outcomes from each domain.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Define functions. Find the domain and the range of a function	Lecture Discussion	Achievement test Oral test
1.2	Memorize concepts of limit and continuity of a function	Lecture Discussion	Achievement test Observation
	Study the concepts of derivatives , definite and indefinite integrals of functions	Lecture Discussion	
	Define differential equations, sequences and series .	Lecture Discussion	
2.0	Cognitive Skills		
2.1	Solve different problems in calculus	Lecture Discussion Problem Solving	Achievement test Observation
2.2	Apply the concept and methods of integration to solve a differential equation.	Lecture Discussion Problem Solving	
	Use an appropriate mathematical concepts to find the general term of sequences and series as well as finding the sum of series.	Lecture Discussion Problem Solving	
3.0	Interpersonal Skills & Responsibility		
4.0	Communication, Information Technology, Numerical		
5.0	Psychomotor		

Suggested Guidelines for Learning Outcome Verb, Assessment, and Teaching

NQF Learning Domains	Suggested Verbs
Knowledge	list, name, record, define, label, outline, state, describe, recall, memorize, reproduce, recognize, record, tell, write
Cognitive Skills	estimate, explain, summarize, write, compare, contrast, diagram, subdivide, differentiate, criticize, calculate, analyze, compose, develop, create, prepare, reconstruct, reorganize, summarize, explain, predict, justify, rate, evaluate, plan, design, measure, judge, justify, interpret, appraise
Interpersonal Skills & Responsibility	demonstrate, judge, choose, illustrate, modify, show, use, appraise, evaluate, justify, analyze, question, and write
Communication, Information Technology, Numerical	demonstrate, calculate, illustrate, interpret, research, question, operate, appraise, evaluate, assess, and criticize
Psychomotor	demonstrate, show, illustrate, perform, dramatize, employ, manipulate, operate, prepare, produce, draw, diagram, examine, construct, assemble, experiment, and reconstruct

Suggested **verbs not to use** when writing measurable and assessable learning outcomes are as follows:

Consider Maximize Continue Review Ensure Enlarge Understand
Maintain Reflect Examine Strengthen Explore Encourage Deepen

Some of these verbs can be used if tied to specific actions or quantification.

Suggested assessment methods and teaching strategies are:

According to research and best practices, multiple and continuous assessment methods are required to verify student learning. Current trends incorporate a wide range of rubric assessment tools; including web-based student performance systems that apply rubrics, benchmarks, KPIs, and analysis. Rubrics are especially helpful for qualitative evaluation. Differentiated assessment strategies include: exams, portfolios, long and short essays, log books, analytical reports, individual and group presentations, posters, journals, case studies, lab manuals, video analysis, group reports, lab reports, debates, speeches, learning logs, peer evaluations, self-evaluations, videos, graphs, dramatic performances, tables, demonstrations, graphic organizers, discussion forums, interviews, learning contracts, antidotal notes, artwork, KWL charts, and concept mapping.

Differentiated teaching strategies should be selected to align with the curriculum taught, the needs of students, and the intended learning outcomes. Teaching methods include: lecture, debate, small group work, whole group and small group discussion, research activities, lab demonstrations, projects, debates, role playing, case studies, guest speakers, memorization, humor, individual presentation, brainstorming, and a wide variety of hands-on student learning activities.

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Midterm Exam	8 th week	20%
2	Alternative Evaluation Methods (Quizzes, Assignments, and Home work)	Over the semester	20%
3	Attendance		10
4	Final Examination	End of Semester	50

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)

E. Learning Resources

1. List Required Textbooks

- (1) THOMAS CALCULUS, THOMAS, Addison Wesley, 2004.
- (2) H. Anton, Calculus with analytical Geometry, 4th edition, John Wiley & sons, New York, 1992.
- (3) R. E. Larson and R. P. Hostetler: Calculus with Analytic Geometry, 5th Ed, D. C. health and company, 1994.
- (4) R.K.Nagle, E.B. Satt and A.D. Snider: Fundamentals of differential Equations& Boundary Value Problems. Addison Wesley, Longman, 2000.
- (5) إليوت مندلسون ، التفاضل والتكامل ٣٠٠٠ مسألة محلولة في التفاضل والتكامل ، المسائل المحلولة شوم ، أكاديميا انترناشونال ، ٢٠٠٠

2. List Essential References Materials (Journals, Reports, etc.)

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

- (1) Calculus , Stewart , Thomson , 2008 .
- (2) Swokowski, Olinick, and Pence: Calculus, Sixth Edition. John Wiely & Sons, New York.
- (٣) د. رمضان محمد جهيمة – د. أحمد عبد العالي هب الريح ، التفاضل والتكامل، الجزء الثاني ، الطبعة الثالثة، دار الكتاب الجديد المتحدة
- (٥) أ.د. حسن مصطفى العويضي – د. عبد الوهاب عباس رجب – د. سناء علي زارع ، المعادلات التفاضلية ، الجزء الأول ، مكتبة الرشد .

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
Classrooms for 20-30 students with data show

2. Computing resources (AV, data show, Smart Board, software, etc.)
Classrooms Should include data show and also laboratories

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
None

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:
✓ Distribution of a questionnaire for students to know how to achieve the goals in the theoretical and practical side.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor:
✓ Discussions with colleagues who specialize in teaching methods and means of learning.
✓ Self-evaluation of the performance of the teacher.
✓ Discussions with other colleagues who taught this course.

3 Processes for Improvement of Teaching
✓ Diagnose weaknesses and turn them into strengths.
✓ Discussions about the decision and methods of teaching
✓ Study the needs of the labor market of college graduates

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)

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

Faculty or Teaching Staff: Dr. Mohammed Mady Bard

Signature: _____ **Date Report Completed:** _____

Received by: _____ **Dean/Department Head**

Signature: _____ **Date:** _____