

T6. Course Specification (CS)

Institution Najran University	Date 13- 5-2017
College/Department, college of Science and Arts, Mathematics	

A. Course Identification and General Information:

1. Course title and code : Real Analysis 2, 381 Math-3	
2. Credit hours : 3 credit hrs.	
3. Program(s) in which the course is offered. Mathematics (If general elective available in many programs indicate this rather than list programs)	
4. Name of faculty member responsible for the course: Asst. prof. Dr. Mohamed El sayed	
5. Level/year at which this course is offered : Level 6 / year / three	
6. Prerequisites for this course (if any): Real analysis (1) 281Math-3	
7. Co-requisites for this course (if any): None	
8. Location if not on main campus : <ul style="list-style-type: none"> College of Arts and Sciences-Najran (Male and Female) College of Arts and Sciences- Sharurah (Male and Female) 	
9. Mode of Instruction (mark all that apply)	
a. Traditional classroom What percentage?	<input type="text"/>
b. Blended (traditional and online) What percentage?	<input checked="" type="checkbox"/> 100%
c. e-learning What percentage?	<input type="text"/>
d. Correspondence What percentage?	<input type="text"/>
f. Other What percentage?	<input type="text"/>
Comments : Use illustrative tools	

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B. Objectives

1. study of main concepts of real analysis as follows:

1. *Studying definition of Riemann integral- Darboux theorem and Riemann sums and operation on them*
2. *Studying the properties and the principale theorem in calculus. Series of functions and its properties.*
3. *Solving system of pointwise convergence and uniform convergence –sigma algebra*
4. *Have the knowledge of Measure –Lebesgue measure and its properties- simple function functions.*
5. *Have the knowledge the theorems of convergences and their properties.*
6. *Studying determinants and operations on relation between Lebesgue and Riemann integral.*

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)

- i. A review in the board of the department and professor of progress course of the Council note about the importance of the development of course content in line with the nature of modern trends in mathematics.
- ii. Re- new the course references frequently.
- iii. The study of learning difficulties faced by students while studying the principles Real analysis.
- iv. Frequently check the latest discovery in science to improve the course objectives.
- v. Review the results of the students and analyzed qualitatively out the most important recommendations about the course.
- vi. The use of electronic learning, such as black board in the course and computer.

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

Course Description

This course will cover the foundations of real analysis 2 The main focus of this Riemann integral- Darboux theorem and Riemann sums, Series of functions and its properties., pointwise convergence and uniform convergence –sigma algebra, relation between Lebesgue and Riemann

integral. Measurable and Measurable function .		
1 Topics to be Covered :		
List of Topics:	No of Weeks	Contact hours
The Riemann integral (Darboux Theorem -Fundamental theorem of calculus	4	12
Sequences of functions Uniformly convergent of Sequences and series of functions-power series-	2	6
Properties of Series of functions - Uniformly convergent of Sequences and series of functions-power series.	3	9
Measure - Borel σ-algebra-outer measure- Lebesgue Measurable sets- Lebesgue measure- properties of Lebesgue measure.	3	9
Definition of Lebesgue integral-Measurable functions- Lebesgue's theorem on bounded convergence - Relationship of Riemann and Lebesgue integrals	3	9

1.Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or studio	Practical	Other:	Total
Contact Hours	45	-	-	-	-	45
Credit	3	-	-	-	-	3

3-Additional private study/learning hours expected for students per week	6
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4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy.

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. (Courses are not required to include learning outcomes from each domain).

Code	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Define the basic concepts of the sequence, the sequences of functions and the power series.	<ul style="list-style-type: none"> The main lectures Scientific discussion.. solve problems method 	<ul style="list-style-type: none"> quarterly tests, and includes two tests final evaluation (test end of the semester) Quizzes. Homework assignments
1.2	Describe the basic concepts and the fundamental properties of Riemann integral and how to prove the function is integrable.		
1.3	Tell the students with the concept of measurable and measurable function, the Lebesgue integral and the difference between Lebesgue integral and Riemann integral.		<ul style="list-style-type: none"> continuous discussions with the students during the lectures Quizzes. Homework assignments
1.4	Recognize the various ways to prove the functions is integrable function		

Code	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
	on the interval		
2.0	Cognitive Skills		
2.1	Enable the student to Find the upper sum and lower sum and Find the Riemann and Lebesgue integral of the functions. Students ability to write physical equations in correct mathematical way.	<ul style="list-style-type: none"> Method of collaborative learning Homework assignments 	<ul style="list-style-type: none"> Doing homework. Check problems solution.
2.2	Create convergent intervals of the <i>sequences and series</i> of functions.	Class discussions	Discussing a group work sheets assignments
3.0	Interpersonal Skills & Responsibility:		
3.1	Illustrate how take up responsibility.	Ask the students to search the internet and use the library	Quizzes of some previous lecturers.
3.2	Must be shown the ability of working independently and with group	Teach them how to cover missed lecturers	Discussion during the lecture
4.0	Communication, Information Technology, Numerical		
4.1	The students should illustrate how to communicating with peers , lecturers and community	Creating working groups with peers to collectedly, prepare . solving problems and search the internet for some topics	Discussing a group work
4.2	Analyze and research information to achieve the accumulation of knowledge related to the decision of the Real analysis use of software Real analysis	Using computer	<ul style="list-style-type: none"> Direct observation and tests observation and continuous evaluation
5.0	Psychomotor		
5.1	None	None	None
5.2	None	None	None

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, Quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	First exam	6	25%
2	Scnd exam	10	25%

3	Final exam	16	50%
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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)

- 3 office hours per week in the lecturer schedule.
- Follow-up the instructions of the head of the department.

E. Learning Resources

1. List Required Textbooks:

1. Charles, C. P., Real Mathematical Analysis, Springer-Verlag New York, 2001. Kolmogorov, A.,

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

- H. L. Royden: Real analysis, 3rd edition, Macmillan publishing Co Inc. New York, 1988.
- D. L. Cohn: Measure theory, Birkhauser Verlag AG, 1993.
- Mali, S. C., Sativa Aurora, Mathematical Analysis, New Delhi, University of Delhi, 1992.

3. List Electronic Materials Web Sites, Facebook, Twitter, etc.

- <http://www.arab-math.com/forum/forumdisplay.php>
- <http://en.wikipedia.org/wiki/Mathematics>
- http://en.wikipedia.org/wiki/Real_analysis

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

- Http// goushusa.smcvt.edu/real analysis .
- CD-ROM containing the scientific subjects in the course

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.)

- Lecture Hall by the number of seats = 30 seat approximately
- Practical labs provided with the microscope and different equipment's for (20-25) students

2. Computing resources (AV, data show, Smart Board, software, etc.)

- DATASHOW
- Smart Board

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
<ul style="list-style-type: none"> • Evaluation electronically organized by the university. • Interview a sample of students enrolled in the course to take their views. • Follow-up over the performance and interaction of students with the course through attendance and tests.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the department.
<ul style="list-style-type: none"> - The team who teaching the same courses must be discuss the course specification and goals - Qualitative analysis of the results of the students. - Box-mail suggestions. - Helping board outside the institution - E-mail suggestions
3. Processes for Improvement of Teaching:
<ul style="list-style-type: none"> - Student evaluation. - Course report. - Program report - Self-evaluation by the professor for the course.
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)
<ul style="list-style-type: none"> • Check and correct sample of student work by faculty members are independent. • Exchange periodically to correct or sample tests with a faculty member of the same specialty in other faculties. • A special committee as determined by the Management College at the end of each semester • Course portfolio and Course report .
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :
<ul style="list-style-type: none"> • Students evaluation- course report – program report • Periodic meetings with students to learn the positive and negative aspects in the course. • The use of specialists in the design and planning of programs and courses. • Update your sources of learning decision to make sure keep pace of developments in the field. • The statistical results to evaluate the students' decision and to benefit from its results in the improvement and development of decision. • Studying Course Report & Improvement Plan • Studying Course Portofolio.

Name of instructor : Dr. Mohamed El sayed

Signature : _____ **Date Report Completed:** __4/5/1439H.

Name of field experience teaching staff !: None

Program coordinator : __Dr. H. Al-Haddad.

Signature: _____ **Date received:** 4/5/1439H.