

T6. Course Specification (CS)

Institution Najran University	Date 4/5/1439H
College/Department Science and Arts/ Mathematics	

A. Course Identification and General Information:

1. Course title and code : Real Analysis(1), 281Math-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 : Associate Prof. Dr. Wadi'a Faïd Hassan Al-shameri			
5. Level/year at which this course is offered: Level 4/2 nd year.			
6. Pre-requisites for this course (if any) : 101Math-3			
7. Co-requisites for this course (if any): None			
8. Location if not on main campus: College of Science and Arts- Najran-Male and Female College of Science and Arts- Sharoura-Male and Female			
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	<input type="text" value="---"/>	What percentage?	<input type="text" value="80%"/>
b. Blended (traditional and online)	<input type="text"/>	What percentage?	<input type="text"/>
c. e-learning	<input type="text"/>	What percentage ?	<input type="text"/>
d. Correspondence	<input type="text"/>	What percentage?	<input type="text"/>
f. Other	<input type="text" value="---"/>	What percentage?	<input type="text" value="20%"/>
Comments :Use illustrative tools			

B. Objectives

1. What is the main purpose for this course?
<ol style="list-style-type: none"> 1. Providing students the scientific facts and concepts about the Field of Real numbers , Field axioms and ordered axioms. 2. Providing students an appropriate amount of information that help to absorb the concepts of Sequences, Continuity, Differentiation, the basic theorems both in the continuity and Differentiation. 3. Give students knowledge of uniform convergence and non-uniform convergence. 4. Distinguish between the main sets and their characteristics by examples. 5. Training students on how to distinguish between the sequence convergence and the limits and continuity of functions. The tendency to take responsibility in the learning process through the tasks assigned.
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)
<ol style="list-style-type: none"> 1. A review in the board of the department and professor of progress decision of the Council note about the importance of the development of course content in line with the nature of modern trends in mathematics. 2. The study of learning difficulties faced by students while studying the principles of real analysis. 3. Review the results of the students and analyzed qualitatively out the most important recommendations about the decision. 4. Ask the students to use the Internet in the estimation of their level in the principles of real analysis. 5. The use of electronic learning, such as Black Board in the course.

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

Course Description :

This course introduces the fundamental concepts of the field of real numbers, finite and infinite sets, countable and uncountable sets. Also, it covers the basic topology of real numbers such as neighbourhoods, open and closed sets, compactness and Heine-Borel theorem. The course provides knowledge of convergence for sequences and Cauchy sequences. Cauchy sequences used for completion of metric spaces. Finally, limits, continuity, differentiation and basic theorems both in the limit, continuity and derivation are demonstrated.

1. Topics to be Covered:		
List of Topics	No. of Weeks	Contact Hours
Field of Real numbers (field axioms and their properties, ordering axiom, Completeness axiom, well-ordering principle, density of rational numbers in the set of real numbers, Properties of absolute value, Intervals,	3	9
Finite and infinite sets, Countable and non- countable sets. Basic Topology of real numbers: Neighbourhoods, open and closed sets, compactness and Heine-Borel theorem.	2	6

Sequences (the concept of sequences, convergence of sequences, Cauchy sequences and complete metric spaces).	3	9
Limits and continuity of functions (the concept of the limits of functions, Theorems in Limits, concept of continuity, uniformly continuity and compact (and complete) spaces.	3	9
Differentiation (concept of derivatives - concept of Differentiable functions- mean value theorem and intermediate theorem- Roal's theorem -L'Hospital's theorem and their applications, Taylor's theorem)	4	12

1. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or studio	Practical	Other:	Total
Contact Hours	45 teaching hours	None	None	None		45 Teaching hours
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	Describe the real line as a complete, ordered field.	<ul style="list-style-type: none"> - Lecture - Discussions - Applications - Home assignments - Exams 	<ul style="list-style-type: none"> • formative evaluation (quarterly tests), and includes two tests • final evaluation (test end of the semester) • take into account the test questions that have the objectivity and consistency, honesty and thoroughness of both the content and objectives of "knowledge, understanding, application, analysis, installation, calendar" to suit the nature of the scheduled
1.2	Define the limit, continuity, differentiability of functions defined on subsets of the real line.	<ul style="list-style-type: none"> - Lecture - Discussions - Applications - Home assignments 	<ul style="list-style-type: none"> • formative evaluation (quarterly tests), and includes two tests • final evaluation (test end of the semester) • take into account the test questions that have the objectivity and consistency, honesty and thoroughness of both the content and objectives of "knowledge, understanding, application, analysis, installation, calendar" to suit the nature of the scheduled
1.3	Define finite, infinite, countable, open, closed, bounded and compact sets.	<ul style="list-style-type: none"> - Lecture - Discussions - Applications - Home assignments 	<ul style="list-style-type: none"> • formative evaluation (quarterly tests), and includes two tests • final evaluation (test end of the semester) • take into account the test questions that have the objectivity and consistency, honesty and thoroughness of both the content and objectives of "knowledge, understanding, application, analysis, installation, calendar" to suit the nature of the scheduled
2.0	Cognitive Skills		
2.1	Describe the basic topological properties of the real line.	Method of collaborative learning. Exams.	-Evaluation methods is optional(note-the student card bundled-case study- Standards appreciation).
2.2	Use the definitions of convergence as they apply to sequences.	Way to solve problems and discussion	-Calendar optional methods(such as the or altest-and pans and objective- Tests performance today-the positions of quasi-real test-tests work).
3.0	Interpersonal Skills & Responsibility		
3.1	Determine the continuity, differentiability of functions defined on subsets of the real line.	Method of observation. and collaborative learning	Evaluation methods is optional(note-the interview questionnaire-the social graph- Student card bundled-Case Study-Survey- Standards appreciation).
3.2	Apply Theorems to problems in the context of real analysis.	Method of playing the roles.	Calendar optional methods(such as gaugest endencies-advanced function aitytests-tests The positions ofquasi-real).
4.0	Communication, Information Technology, Numerical		

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
4.1	Write numerical solutions to problems	Way of practical exercises. and the survey.	Direct observation
4.2	Calculate the limit function, and continuity and differentiability at a point in the domain of functions.	Using the Web Quest.	Direct observation
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	Second Exam	10	25%
3	Final Exam	15	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)

- Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)
- Office hours for a faculty member for 3 hours weekly.
- Follow-up the instructions of the head of the department.

E. Learning Resources

1. List Required Textbooks:

- 1- Kolmogorov, A., Fomin, S., Introductory Real Analysis, Mc Graw-Hill, New York, (Revised English translated and edited by "Siverman, R. A."), 1986.

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

<p>1-Charles, C. P., Real Mathematical Analysis, Springer-Verlag New York, 2001.</p> <p>2-Kolmogorov, A., Fomin, S., Introductory Real Analysis, McGraw-Hill, New York, (Revised English translated and edited by “Siverman, R. A.”), 1986.</p> <p>3-Bridges, D. S., Foundations of Real and Abstract Analysis, Springer-Verlag New York, 1998.</p> <p>4-Mali, S. C., Sativa Aurora, Mathematical Analysis, New Delhi, University of Delhi, 1992.</p> <p>5-Hawkins, T., Lebesgues Theory of Integration, University of Wisconsin press, Madison, 1970.</p> <p>3. List Electronic Materials Web Sites, Facebook, Twitter, etc.</p> <p>http://www.arab-math.com/forum/forumdisplay.php?f=7</p> <p>http://en.wikipedia.org/wiki/Mathematics</p> <p>http://en.wikipedia.org/wiki/Real_analysis</p> <p>4. Other learning material such as computer-based programs/CD, professional standards or regulations and software.</p>	None
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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.)
<p>1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)</p> <ul style="list-style-type: none"> Lecture Hall by the number of seats = 30 seat approximately.
<p>2. Computing resources (AV, data show, Smart Board, software, etc.)</p> <ul style="list-style-type: none"> Datashow Smart Board <p>3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)</p> <ul style="list-style-type: none"> None

G. Course Evaluation and Improvement Processes:

<p>1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching</p> <ul style="list-style-type: none"> 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 during attendance and Student course evaluation survey at the end of semester. Exams.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the department.

<ul style="list-style-type: none"> • Qualitative analysis of student's results. • Helping board outside the institution. • Follow-up of graduates after graduation. • E-mail suggestions. • Student course evaluation survey at the end of semester. • Applying the new system of Faculty staff members evaluation
<p>3. Processes for Improvement of Teaching:</p> <ul style="list-style-type: none"> • Training programs and workshops for faculty members on the most important teaching methods based on learner. • Self-evaluation by Professor of the course. • Ensuring the use of the tools related to the course. • Create the right atmosphere for students through social programs, entertainment, and other. • Upgrading the relationship between teacher and student to become a human relationship. • Follow-up new teaching strategies.
<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"> • Checking and correcting sample of student work by faculty independent members. • Exchange periodically to correct exams with a faculty member of the same specialty in other faculties. • Special committee can be determined by management of the faculty at the end of each semester.
<p>5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :</p> <ul style="list-style-type: none"> • Hosting a visiting professor to evaluate the decision and developed his Article. • Periodic meetings with outstanding students to learn the positive and negative aspects in the decision. • 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. • Course Portfolio Course report • Trend Analysis.

Name of instructor: Associate Prof. Dr. Wadi'a Faïd Hassan Al-shameri

Signature: **Date Report Completed** : 4/5/1439H.

Name of field experience teaching staff : None

Program coordinator: Assistance Prof. Dr. Hamood Al-haddad

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