

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Al-Nahrain University
2. University Department/Centre	College of Science/ Department of Mathematics and Computer Applications
3. Course title/code	Real Analysis I/MATH 310
4. Modes of Attendance offered	physical attendance
5. Semester/Year	First Semester/ Year Three
6. Number of hours tuition (total)	60 hours
7. Date of production/revision of this specification	15/10/2022
8. Aims of the Course	
	<ul style="list-style-type: none">• To provide a formal introduction to mathematical analysis by approaching concepts crucial in subsequent analytical topics.• Emphasis will be given to the concepts of Real numbers, Convergent of sequences of real numbers, Metric Spaces.• Understanding the need for proof and developing the skills to enable the student to construct for themselves formal proofs.

9. Learning Outcomes, Teaching ,Learning and Assessment Methode

A- Cognitive goals:

- A1. Understand the real number system.
- A2. Understand concepts of convergence and divergence for sequences, subsequences and Cauchy sequences.
- A3. Understand metric spaces, complete metric spaces and compact metric spaces.
- A4. Communicate mathematical argument.

B. The skills goals special to the course.

- B1. Apply definitions & theorems presented throughout the course to solve a variety of problems.
- B2. Determine by proof whether certain sets, sequences possess said properties.

Teaching and Learning Methods

- Giving Lectures supported by exercises and activities in the classroom
- Daily and Weekly Assessments.
- Giving homework.

Assessment methods

- Participation in the classroom.
- Submit Homework.
- Semester and final Assessments and activities.

C. Affective and value goals

- C1. Developing the student's ability to work on assignments and send them on time.
- C2. Applying concepts by solving different types of exercises.
- C3. Developing the student's ability to argue and discussion.

Teaching and Learning Methods

- Managing the lecture in an applied manner related to the reality of daily life to attract the student to the topic of the lesson.
- Allocate a percentage of grade for assignments. and daily assessments.
- Assigning the student some group activities and assignments.

Assessment methods

- Active Participation in the lesson.
- Commitment to the deadline specified in the submission of exercises.
- The Mid-Semester and End-of-Semester exams express the obligation and skill achievement.
- Exercises and daily duties.

D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)

D1. Emphasizing the importance of linking different concepts.

D2. Develop the student's ability to search on the Internet.

D3. Develop the student's ability to dialogue and discussion.

D4. Develop the student's ability to deal with technical means.

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
The First	(3)+(1) discussion	Well-ordered sets, complete sets	Real Numbers	Lectures	General questions, discussion and assignments
The Second	(3)+(1) discussion	Absolute value	Real Numbers	Lectures	General questions, discussion and mid-semester exam
The Third	(3)+(1) discussion	Definition of the sequence,	Sequences	Lectures	General questions, discussion and assignments
The Fourth	(3)+(1) discussion	convergent and divergent sequences	Sequences	Lectures	General questions, discussion and daily test
The Fifth	(3)+(1) discussion	Monotonic sequences	Sequences	Lectures	General questions, discussion and assignments
The sixth	(3)+(1) discussion	Subsequences	Sequences	Lectures	General questions, discussion and daily test
The Seventh	(3)+(1) discussion	Cauchy sequences	Sequences	Lectures	General questions, discussion and a mid-semester exam
The Eighth	(3)+(1) discussion	Definition of metric spaces with examples	Metric Spaces	Lectures	General questions, discussion and daily test
The Ninth	(3)+(1) discussion	Open and closed sets	Metric Spaces	Lectures	General questions, discussion and assignments
The tenth	(3)+(1) discussion	Limit points	Metric Spaces	Lectures	General questions, discussion and daily test
The Eleventh	(3)+(1) discussion	Convergent sequence, Cauchy sequences	Metric Spaces	Lectures	General questions, discussion and assignments
The Twelfth	(3)+(1) discussion	Complete metric spaces	Metric Spaces	Lectures	General questions, discussion and a mid-semester exam
The Thirteenth	(3)+(1) discussion	Contraction Mapping	Metric Spaces	Lectures	General questions, discussion and daily test
The Fourteenth	(3)+(1) discussion	Compact sets	Metric Spaces	Lectures	General questions, discussion and assignments
The Fifteenth	(3)+(1) discussion	Hiene-Borel Theorem	Metric Spaces	Lectures	General questions, discussion and a mid-semester exam

11. Infrastructure	
1. Books Required reading:	- Introduction to Mathematical Analysis, Adil G. Naoum, Baghdad University-Iraq.
2. Main references (sources)	- Introduction to Mathematica Analysis, William F. Trench -USA 2015
A- Recommended books and references (scientific journals, reports...).	- Principle of Mathematical Analysis, Walter Rudin, 2000
B-Electronic references, Internet sites...	https://www.britannica.com/science/analysis-mathematics
12. The development of the curriculum plan	
Searching and staying up-to-date on the latest books and research on the Mathematical Analysis and their inclusion in the plan.	