The University of Jordan

Accreditation & Quality Assurance Center

Course Syllabus

CourseName

0301711 Real analysis

1	Course title	Real Analysis
2	Course number	0301711
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4	Prerequisites/corequisites	non
5	Programtitle	M.SC. In Mathematics
6	Programcode	
7	Awarding institution	The University of Jordan
8	Faculty	Science
9	Department	Mathematics
10	Level of course	Compulsory specialization requirement
11	Year of study andsemester(s)	1st year, 2nd semester
12	Final Qualification	M.SC. In Mathematics
13	Other department(s) involved in teaching the course	--
14	Language of Instruction	English
15	Date of production/revision	20/10/2020

16. Course Coordinator:

R. Khalil

17.Other instructors:

Professor A.Talafha
Prof. Yousef, A.

18. Course Description:

Sigma algebras, outer measures, measures, Lebesque measure, measurable sets, measurable functions, Lebesque Integration, L-p-spaces, differentiation of monotone functions, functions of bounded variation, Basics of normed spaces

1.

2.19. Course aims and outcomes:
3.

A- Aims: to understand the concept of outer measure and measure and the main structure of Lebesgue measure and Lebesgue integration Banach spaces

B- Intended Learning Outcomes (ILOs): Upon successfulcompletionof thiscoursestudentswillbeableto…

B1. To know the deep basicmeasure theory

B2. To know different examples of well known measure

B3. To ask questions in basic theory of integration

B4. To know the structure of Lp-spaces

20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
4. Sigma algebras	5. 1	6.	7. B4	8. Homework	9. Royden
6. outer	10. 2	11.	B1	12. Fir	Royden

measures				st exam	
13. Basic properties of measures	14. 3	15.	B1	16. Home work	Royden
8.The Lebesgue measure	17. 4	18.	19. B1, B2	20. Second exam	Royden
21. Lebesgue Integration	22. 5-6	23.	24. B1, B3	25. Presentation 26. Second Exam	Royden
27. The spaces L1 and L2	28. 7	29.	30. B1, B4	31. Home work	Royden
32. Fuctions of bounded variation	33. 8	34.	35. B1, B4	36. Presentation	Royden
37. Types	38. 9	39.	40. B1,	41. fin	Royden

of convergence in measure theory			B5	al	
42. mean and almost uniform convergence	43. 10	44.	45. B1, B5	46. Homework	Royden
47. Examples of classes of integrable functions	48. 11	49.	50. B1, B5	51. Third Exam	Royden
52. Introduction to norms on function spaces	53. 12	54.	55. B1, B6	Homework	Royden
56. Introduction to completeness of certain function	57. 13	58.	59. B7	Homework	Royden

spaces					
60. Linear functional on function spaces	61. 14	62.	63. B7	Homework	Krisique

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following <u>teaching and learning methods</u>:

In order to succeed in this course, each student needs to be an active participant in learning – both in class and out of class.
- Class time will be spent on lecture as well as discussion of homework problems and some group work.
- To actively participate in class, you need to prepare by reading the textbook and doing all assigned homework before class (homework will be assigned each class period, to be discussed the following period).
- You should be prepared to discuss your homework (including presenting your solutions to the class) at each class meeting - your class participation grade will be determined by your participation in this.

You are encouraged to work together with other students and to ask questions and seek help from the professor, both in and out of class.

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following <u>assessment methods and requirements</u>:

ILO/s	Learning Methods	Evaluation Methods	Related ILO/s to the program
	Lectures	Exam	
		Presentation	
		Homework	

23. Course Policies:

1. The student is not allowed to take the course and its pre-requisite in the same time.
2. Attendance is absolutely essential to succeed in this course. You are expected to attend every class; please notify your instructor if you know you are going to be absent. All exams must be taken at the scheduled time. Exceptions will be made only in extreme circumstances, by prior arrangement with the instructor.
3. If a student is absent for more than 10% of lectures without an excuse of sickness or due to other insurmountable difficulty, then he/she shall be barred from the final examination also he/she will get a failing grade in this course.
4. Medical certificates shall be given to the University Physician to be authorized by him. They should be presented to the Dean of the Faculty within two weeks of the student's ceasing to attend classes.
5. Test papers shall be returned to students after correction. His/her mark is considered final after a lapse of one week following their return.
6. Solutions for the exams questions and marks will be announced at the webpage of the instructor:
   http://eacademic.ju.edu.jo/eabuosba/default.aspx
7. Cheating is prohibited. The University of Jordan regulations on cheating will be applied to any student who cheats in exams or on homeworks.

24. Required equipment:

25. References:

Rudin, W. Functional analysis

Royden, real analysis

Kriseque. Introduction to functional analysis

26. Additional information:

Name of Course Coordinator: Professor Khalil, R.Signature: ---------------R. Khalil---------- Date: 29/3/2017

Head of curriculum committee/Department: ----------------------- Signature: -------------------------------

Head of Department: ------------------------ Signature: --------------------------------

Head of curriculum committee/Faculty: ------------------------ Signature: --------------------------------

Dean: -- -Signature: --------------------------------

Copy to:
Head of Department
Assistant Dean for Quality Assurance
Course File