



مركز الاعتماد
وإضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER



The University of Jordan

Accreditation & Quality Assurance Center

Course Syllabus

CourseName

0301911 Functional analysis

1	Course title	Functional Analysis
2	Course number	0301911
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4	Prerequisites/corequisites	Functional analysis Master
5	Programtitle	PhD. 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)	1 st year, 2 nd semester
12	Final Qualification	PhD. 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:

Theory of Banach spaces , Main theorems in Functional analysis: Hahn Banach Theorem, closed graph theorem, open mapping theorem, Uniform boundedness principle, and the KreinMilman Theorem. Spectral theory of bounded linear operators. Analysis of Compact operators

1.

2.19. Course aims and outcomes:

3.

A- Aims: to understand spectral theory of bounded linear operators and to know the structure of compact operators on Banach spaces

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to...

- B1. To know the deep structure of Banach spaces
- B2. To know different structures of Banach spaces
- B3. To ask questions in functional analysis
- B4. To classify operators compact or not
- B5. To be able to classify operators according to the spectrum

20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
4. Banach spaces	5.1	6.	7. B4	8. Homework	9. Rudin
6. Bounded	10. 2	11.	B1	12. Fir	Rudin

linear operators				st exam	
13. Spectral theory	14. 3	15.	B1	16. Homework	Rudin
8.Spectral theory2	17. 4	18.	19. B1, B2	20. Second exam	Rudin
21. Compact operators	22. 5-6	23.	24. B1, B3	25. Presentation 26. Second Exam	Rudin
27. Compact operators 2	28. 7	29.	30. B1, B4	31. Homework	32.Rudin
33. Applications of spectral theory	34. 8	35.	36. B1, B4	37. Presentation	Conway
38. Applicat	39. 9	40.	41. B1,	42. fin	Taylor

ions of compact operators			B5	al	
43. Resolve nets of Operators	44. 10	45.	46. B1, B5	47. Homework	Taylor
48. KrienMiman Theorem	49. 11	50.	51. B1, B5	52. Third Exam	Foot & Dummit
53. Extreme points	54. 12	55.	56. B1, B6	Homework	Rudin
57. Extrema of linear functionals	58. 13	59.	60. B7	Homework	Rudin
61. Application to optimization	62. 14	63.	64. B7	Homework	Krisique

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

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 assessment methods and requirements:

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
Helemberg, G. Spectral theory in Hilbert spaces
John Conway. A course in functional analysis

26. Additional information:

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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