



مركز الاعتماد
وإضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER



The University of Jordan

Accreditation & Quality Assurance Center

Course Syllabus

CourseName
Commutative Algebra

1	Course title	Commutative Algebra
2	Course number	0301942
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4	Prerequisites/corequisites	--
5	Programtitle	PhD. In Mathematics
6	Programcode	
7	Awarding institution	The University of Jordan
8	Faculty	Science
9	Department	Mathematics
10	Level of course	Elective Course
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	26/10/2020

16. Course Coordinator:

Prof. Emad Abuosba
 Math 308
 Tel: 22088
 E-mail: eabuosba@ju.edu.jo

17. Other instructors:

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18. Course Description:

As stated in the approved study plan.

Review modules over commutative rings, chain conditions, projective and flat modules, localizations, domains and ideal theory, integral extensions, valuation rings.

19. Course aims and outcomes:

A- Aims:
To understand the basic concepts of commutative ring and module theory. To be able to participate in scientific discussions and begin with own research in commutative algebra and its applications.
B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able
B1. To write correct mathematical proofs concerning commutative rings, modules and ideals.
B2. To know the definition of exact sequence of modules and some important properties and application of it
B3. To determine injective and projective modules.
B4: To know construction of localization and the basic properties of it.
B5: To be familiar with notions of Noetherian and Artinian rings and modules.
B6: To understand the defining characteristic of special rings including regular ring, pp-ring, pf-ring, semi-hereditary ring and hereditary rings, and valuation rings.
B7: To understand the concept of integral extension.
B8. To be familiar with fundamental results in commutative algebra.

20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
1. Basic module and ideal notions and constructions	1-3		B1	Homework	Atyah and Macdonald
2. Free modules	4		B1	Homework	Atyah and Macdonald
3. Exact sequence	5-6		B1		Atyah and Macdonald
4. Flat Modules, , Projective and injective modules	7-8		B1,B2	First Exam	Atyah and Macdonald
5. Rings and Modules of Fractions	9		B1,B3	Homework	Atyah and Macdonald
6. Chain conditions	10		B1,B4	Homework	Atyah and Macdonald
7. Noetherian Rings	11		B1,B4	Presentation	Kaplansky
8. Artinian rings	12		B1,B5	Second Exam	Atyah and Macdonald
9. Prime ideals and integral extension	13-14		B1,B5	Presentation	Kaplansky
10. Valuation ring	14-15		B1,B5	Homework	Atyah and Macdonald

21. Teaching Methods and Assignments:

<p>Development of ILOs is promoted through the following <u>teaching and learning methods</u>:</p> <p>In order to succeed in this course, each student needs to be an active participant in learning – both in class and out of class.</p> <ul style="list-style-type: none"> - 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. <p>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.</p>
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22. Evaluation Methods and Course Requirements:

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

and requirements:

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

23. Course Policies:

1. 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:
7. Cheating is prohibited. The University of Jordan regulations on cheating will be applied to any student who cheats in exams or on homework's.

24. Required equipment:

25. References:

- (1) Introduction to Commutative Algebra by Atiyah and Macdonald.
- (2) Commutative Rings by Kaplansky.

26. Additional information:

Name of Course Coordinator: Signature: ----- Date:

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