

COURSE OF STUDY	TWO-YEAR MASTER OF SCIENCE PROGRAMME IN MATHEMATICS
ACADEMIC YEAR	2023-2024
ACADEMIC SUBJECT	NON COMMUTATIVE RINGS

General information	
Term	Second semester (February 26, 2024 – May 31, 2024)
European Credit Transfer and Accumulation System credits (ECTS)	7
SSD	MAT/02 – Algebra
Language	Italian
Mode of attendance	Not mandatory

Lecturer	
Name and surname	Lucio Centrone
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Department and office	Department of Mathematics, room 1 fourth floor
Virtual meeting room	Microsoft Teams code x55i61s
Web page	https://www.dm.uniba.it/it/members/centrone
Office hours	Monday 14:30-16:30 and by appointment via e-mail

Work schedule				
	Total	Lectures	Hands-on learning	Self-study
Hours	175	56		119
ECTS credits	7	7		

Learning objectives	
	Introduce the student to the language of noncommutative rings; give to the student the classical tools to solve complex problems in noncommutative algebra; give to the student a general overlook toward the state of the art of research in abstract algebra.

Course prerequisites	
	Knowledge of basic algebraic structures

Syllabus	
Course contents	Jacobson Radical: Modules, rings and radicals, artinian rings, semisimple artinian rings; Semisimple rings: density Theorem, classification of semisimple rings; Commutativity theorems: Wedderburn Theorem and its generalizations; Polynomial identities: definiton, examples, Kaplansky's Theorem, connection with the representation of a group.
Reference books	I.N. Herstein, Noncommutative rings; T.Y. Lam, A first course in noncommutative rings
Additional course materials	
Repository	

Expected learning outcomes



Knowledge and understanding	The knowledge of basic algebraic structure will be enlarged with the notion of an algebra and of a module requiring a different visualization and a different approach to problems.
Applying knowledge and understanding	Ability in solving problems of a purely abstract origin; describing a real event through adequate algebraic structures.
Soft skills	<i>Making judgements:</i>
	<i>Communication skills:</i>
	<i>Learning skills:</i>

Teaching methods	
	Classical lectures; study of a recent published paper in algebra

Assessment	
Assessment methods	Classical oral exam, seminar
Evaluation criteria	<ul style="list-style-type: none"> • <i>Knowledge and understanding:</i> it will be evaluated through direct questions, as usual. • <i>Applying knowledge and understanding:</i> when necessary, we will make use of a written test previously scheduled with the students. • <i>Making judgement:</i> • <i>Communication skills:</i> mastery of terms and techniques will be evaluated during the exam through direct questions. • <i>Learning skills:</i> during the exam the student will be asked to solve simple problems that are direct consequence of the definitions given in the lectures.
Grading policy	The exam can be considered approved if the final mark is greater than or equal to 18/30. The student has to show mastery of the language, methodological rigor and further to have acquired notions and basic concepts of the argument. The final mark is based on the achievement of the goals expected. In order to get a good evaluation the student has to develop an adequate argumentation and exposition skill. The final mark is assigned in thirties and can be considered approved if it is greater than or equal to 18/30. The so-called "Lode" can be achieved under further deepening of the argument treated along the lectures.

Further information	
	Students that are interested in are invited to write to the lecturer at least one week before the beginning of the semester.