

Cover Sheet: Request 14971

MAS 4302 - Abstract Algebra 2

Info

Process	Course New Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Peter Sin sin@ufl.edu
Created	5/2/2020 9:18:00 PM
Updated	10/27/2020 2:16:33 PM
Description of request	Proposal for new course Abstract Algebra 2

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CLAS - Mathematics 16320000	Kevin Knudson		5/3/2020
No document changes					
College	Conditionally Approved	CLAS - College of Liberal Arts and Sciences	Joseph Spillane	The CLAS Curriculum Committee conditionally approves this request, with the following changes requested: 1) revise excused absences commentary, to be consistent with UF guidelines; 2) add a Week 15; 3) remove the syllabus	10/1/2020
No document changes					
Department	Approved	CLAS - Mathematics 16320000	Kevin Knudson		10/1/2020
No document changes					
College	Approved	CLAS - College of Liberal Arts and Sciences	Joseph Spillane		10/27/2020
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			10/27/2020
No document changes					
Statewide Course Numbering System					
No document changes					
Office of the Registrar					
No document changes					
Student Academic Support System					
No document changes					
Catalog					
No document changes					
College Notified					

Step	Status	Group	User	Comment	Updated
No document changes					

Course|New for request 14971

Info

Request: MAS 4302 - Abstract Algebra 2
Description of request: Proposal for new course Abstract Algebra 2
Submitter: Peter Sin sin@ufl.edu
Created: 10/1/2020 1:59:07 PM
Form version: 3

Responses

Recommended Prefix MAS
Course Level 4
Course Number 302
Category of Instruction Advanced
Lab Code None
Course Title Abstract Algebra 2
Transcript Title Abstract Algebra 2
Degree Type Baccalaureate

Delivery Method(s) On-Campus
Co-Listing No

Effective Term Spring
Effective Year 2021
Rotating Topic? No
Repeatable Credit? No

Amount of Credit 3

S/U Only? No

Contact Type Regularly Scheduled

Weekly Contact Hours 3

Course Description A second course in Abstract Algebra, focusing on Galois Theory, the algebraic theory of fields and polynomial equations. Introduces concepts of abstract algebra used in settling famous historical problems including the problems of angle trisection and duplication of cubes by ruler and compass constructions, and the insolubility of polynomial equations of the fifth degree by radicals.

Prerequisites MAS 4301

Co-requisites N/A

Rationale and Placement in Curriculum Galois Theory is a showpiece of mathematical unification, bringing together several branches of mathematics, that students have studied in earlier courses, to create a powerful machine for the solution of problems of considerable historical and mathematical importance.

It is an eminently suitable final-year topic for mathematics majors who are attracted by the power of abstract reasoning, and are perhaps thinking of pursuing graduate work in pure mathematics.

Course Objectives -determine irreducibility of polynomials.

-understand the algebraic structure of fields generated by roots of polynomials.

-compute the Galois groups of polynomial equations.

-apply the Galois correspondence to solve cubic and quartic equations by radicals.

-carry out certain ruler and compass constructions and determine that others are impossible.

Course Textbook(s) and/or Other Assigned Reading Galois Theory, Fourth Edition, by Ian Stewart, CRC press, 2015

Weekly Schedule of Topics Week 1: Classical algebra, Polynomials, roots.

Week 2: Factorization of polynomials, Euclidean algorithm, Fundamental Theorem of Algebra.

Week 3: Field extensions, simple extensions.

Week 4: Algebraic and transcendental extensions.

Week 5: Degree of extensions, the Tower Law.

Week 6: Ruler-and-compass constructions, impossibility proofs.

Week 7: The idea behind Galois Theory, historical background.

Week 8: Galois groups, the Galois correspondence.

Week 9: Splitting fields, normality, separability.

Week 10: The Fundamental Theorem of Galois Theory.

Week 11: Solubility of equations by radicals, radical extensions

Week 12: The general polynomial equation, elementary symmetric polynomials, solving cubic and quartic equations.

Week 13: Finite fields.

Week 14: Algebraically closed fields, Sylow's Theorem.

Week 15: The Fundamental Theorem of Algebra

Grading Scheme Homework will be assigned every two weeks on a Friday and due the next Friday, so there will be about 7 total assignments. The homework will foster mastery over the material covered in class in the previous two weeks. It will include

writing proofs of general propositions and computations of specific examples.

There will be three 50-minute exams. The first two will take place in class on Wednesday during week 5 and week 10. The third exam will take place during the class's final exam slot.

The three exams are weighted equally and are not cumulative. The three exams constitute 80% of the and the homework is 20%. The grade ranges for

total scores are:

93-100% A, 90-92% A-, 88-89%B+, 83-87% B, 80-82% B-, 78-79% C+,73-77% C, 70-72% C-, 60-69% D, <60% E.

Instructor(s) Peter Sin

Attendance & Make-up Yes

Accommodations Yes

UF Grading Policies for assigning Grade Points Yes

Course Evaluation Policy Yes