

AS.110.435 section 88 Syllabus

Introduction to Algebraic Geometry

Course Information

Expanded Course Description::

The first part of the course (Chapters 1-14) covers general basics of Algebraic Geometry. We apply this to curves in Chapters 15-20. The plan is to cover 2-3 chapters every two weeks.

Course topics:

- Affine and Projective Algebraic Sets
- Elimination Theory
- Ideals in Polynomial Rings and the Zariski Topology
- Regular and Rational Functions
- Morphisms and Rational Maps
- Product Varieties
- Finite Morphisms
- Dimension
- Smooth and Singular Points
- Power Series
- Affine and Projective Plane Curves
- Resolution of Singularities for Curves
- Divisors, Linear Equivalence, and Linear Series
- The Riemann-Roch and Riemann-Hurwitz Theorems

Course Information:

Introduction to Algebraic Geometry

AS.110.435.88 (3.0 Credits)

Description

Algebraic geometry studies zeros of polynomials in several variables and is based on the use of abstract algebraic techniques, mainly from commutative algebra, for solving geometric problems about these sets of zeros. The fundamental objects of study are algebraic varieties which are the geometric manifestations of solutions of systems of polynomial equations. Algebraic geometry occupies a central place in modern mathematics and has multiple conceptual connections with diverse fields such as complex analysis, topology and number theory. This course aims to provide to an undergraduate student majoring in mathematics the fundamental background to approach the study of algebraic geometry by providing the needed abstract knowledge also complemented by several examples and applications.

AS Foundational Abilities

Science and Data (FA2)

Department: AS Mathematics

College: Krieger School of Arts and Sciences

Course Learning Outcomes

Course Learning Outcomes:



No Course Learning Outcomes are available for this course.

Required Text and Other Materials

Textbooks:

An Undergraduate Primer in Algebraic Geometry by C. Ciliberto. ISBN-13: 978-3-030-71020-0

Evaluation and Grading

Note that the final course syllabus may differ from the information below.

Grading Breakdown:

70% Homework

30% Final Exam

Grading Scale:

Percentages above 90, 80, 70, 60% are respectively guaranteed the grades A, B, C, D. The instructor reserves the right to *lower* these thresholds to reflect the difficulty of the exams and assignments. The top few points of each letter grade get a "+" appended to the letter, and the bottom few points of each letter grade get a "-" appended to the letter.

KSAS Academic Policies

The policies below are regularly updated to reflect KSAS teaching policies and guidelines.

Academic Policies:



Academic Integrity

The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the internet, generative AI, or electronic devices, unauthorized collaboration, alteration of graded assignments, forgery or falsification, lying, facilitating academic dishonesty, and unfair competition.

Report any violations you witness to the course instructor. You can read the [Homewood Undergraduate Academic Ethics Policy](#) in detail and report an incident through Student Affairs. You may consult the Associate Dean of Student Conduct (or designee) by calling the Office of the Dean of Student Life at 410-516-8208 or via email at studentconduct@jhu.edu.



Student attendance and illness

Class attendance is a student responsibility and is expected of all JHU undergraduate students. Occasionally, health, family or personal matters may interfere with a student's ability to attend class. In this situation, the student is expected to notify their professors and instructors as soon as possible about missing class and discuss how to make up missed class time or assignments. More detailed information is provided by the [Dean of Students](#). Please note that the [Student Health and Wellness Center](#) does not provide documentation for students who miss individual classes.



Religious Holidays

Religious holidays are valid reasons to be excused from class. Students who must miss a class or an examination because of a religious holiday must inform the instructor as early in the semester as possible in order to be excused from class or to make up any work that is missed. A list of many [Religious Holidays and Holy Days](#) is maintained by Student Affairs and more information may be found at [Religious and Spiritual Life](#). If you have any questions regarding a particular case or would like any guidance, please do not hesitate to contact the [Johns Hopkins University Chaplain](#) at 410-516-1880 or kschnurr@jhu.edu.

Students may also request a [Religious Accommodation](#) through the [Office of Institutional Equity](#).



Student drop deadline

The last day a student can drop a class is at the end of the sixth full week of classes. The [Academic Calendar Page](#) contains specific information about drop and withdraw dates published by the University Registrar's.



Incomplete grades

The Incomplete Grades policy is articulated in the "Grades" section of the [Academic Catalogue](#).

Please visit the Academic Catalogue for the most up to date deadlines related to incomplete grades and the process for students to make an incomplete request.



Final Examinations

For more information on final exams, please consult the [Final Exam Policy](#) in the Academic Catalogue.

The Final Exam Schedule is updated each semester and is available through the [Registrar's Office](#) under Students --> Course Schedule.

Please note that instructors are not permitted to make ad hoc arrangements for the administration of final examinations.



Final Course Grades

Course grades are submitted within 48 hours of the administration of the scheduled final exam time/final project due date (if in lieu of a final exam, etc.).

Final course grades will appear in SIS > My Grades. More information about accessing a summary of your official course grades can be found through the [IT Office](#).



Starfish for reporting student progress/difficulty

[Starfish](#) is a tool through which faculty may raise concerns about students experiencing academic or personal challenges. This is an early intervention system that can be used to connect the appropriate assigned staff members to a student in order to provide support and resources. Students and advisors may be notified when a starfish flag is submitted. Starfish is also the platform that can collect mid-semester progress reports for undergraduate students.



Students with Disabilities – Accommodations and Accessibility

Students with disabilities (including those with psychological conditions, medical conditions and temporary disabilities) **must request that their accommodations are shared** with instructional staff by Student Disability Services (SDS) for each course. SDS will then provide an Accommodation Letter with instructors. Please request accommodations be shared for this course as early as possible to provide time for effective communication and arrangements.

Johns Hopkins University values diversity and inclusion. We are committed to providing welcoming, equitable, and accessible educational experiences for all students. For further information or to start the process of requesting accommodations, please contact [Student Disability Services at Homewood Campus](#), Shaffer Hall #101, call: 410-516-4720 and email: studentdisabilityservices@jhu.edu or visit the website.



Student Health and Wellness

[Health and Wellness](#) is an integral part of Campus Life at Johns Hopkins University. The Health and Wellness page has information on the Student Health Center, Health Promotion, Fitness, and Sexual Assault Response and Prevention.

For all illness, please note that “Sick notes” are not required to be provided and students should abide by the honor system when reporting that they need to miss class due to a medical issue.

If you are struggling with anxiety, stress, depression or other mental health related concerns, please consider visiting the JHU Counseling Center. There is more information about **Mental Health Services** in the section below.



Mental Health Services

Anxiety, stress, and mental health

JHU has several resources to support students. Many students experience stress, anxiety or depression during their college career. The [Counseling Center](#) has many resources available to students.

In addition, The [Johns Hopkins University Behavioral Health Crisis Support Team](#) (BHCST) pairs experienced, compassionate crisis clinicians with specially trained public safety officers on every shift on and around the Homewood campus, seven days a week. The BHCST will provide immediate assistance to those who need it and, just as importantly, link individuals in crisis to ongoing support services in the days and weeks that follow. Homewood community members can call Public Safety, 410-516-5600, and ask for a BHCST clinician.

If you have concerns about yourself or a fellow student, please contact:

- For [emergencies](#) (threat to self or others): 410-516-4600 or 911
- For on-scene mental health support: BHCST at 410-516-4600
- For all undergraduates: Student Outreach & Support at 410-516-7857 or studentoutreach@jhu.edu (undergraduates)



AS Foundational Abilities

Krieger launched the [General Education Model](#) in Fall 2024 based on the six [Foundational Abilities](#). The Arts and Sciences Foundational Abilities (AS-FA) requirement is designed to ensure that students earn a number of credits in academic areas outside of their primary major, developing breadth as well as depth.

Krieger courses are tagged with an AS-FA-tag. Guidance for students and faculty about the Foundational Abilities can be found in the [Academic Catalogue](#) or the [First-Year Academic Guide](#) distributed by the KSAS and WSE Offices of Academic Advising. Course tags are visible in the Academic Catalogue and in SIS.



Inclusivity and Classroom Climate

Johns Hopkins University is committed to creating a classroom environment that values the diversity of experiences and perspectives that all students bring. Everyone on campus has the right to be treated with dignity and respect. JHU believes fostering an inclusive climate is important because research shows that students who interact with peers who are different from themselves learn new things and experience tangible educational outcomes. You can read more about the commitment to an inclusive educational environment and goals based on results of the Campus Climate Survey through the [Office of the Provost](#).

Please help create a welcoming and vibrant classroom climate. You should expect to be challenged intellectually by instructors, the TAs, and your peers, and at times this may feel uncomfortable. Indeed, it can be helpful to be pushed sometimes in order to learn and grow. But at no time in this learning process should someone be singled out or treated unequally on the basis of any seen or unseen part of their identity.



University Statement on Equal Opportunity

Johns Hopkins University is committed to equal opportunity for its faculty, staff, and students. To that end, the university does not discriminate on the basis of sex, gender, marital status, pregnancy, race, color, ethnicity, national origin, age, disability, religion, sexual orientation, gender identity or expression, veteran status or other legally protected characteristic. You can read detailed equity statements from the [Office of Institutional Equity](#).