

# Syllabus for Math 190s: The Mathematics of the Universe

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## Instructor Information:

Hubert Bray, Professor of Mathematics and Physics, Duke University  
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## Course Information:

Class meets 10:00 a.m. to 12:05 p.m., Monday through Friday, July 10-August 1, 2018, in Physics 227. The final exam is on August 2, 2018, from 9 a.m. to 12 p.m., in our usual classroom.

## Office Hours:

After class, upon request. You may also schedule a meeting by email.

## Course Objectives:

The goal of this seminar course is for students to gain a broad knowledge of the many ways mathematics is used to describe and understand the universe and everything within it. While the universe itself will be a favorite topic, every application of mathematics to physics, science, and the real world is fair game for discussion in class as well as the three 5-10 page papers that each student will write. The instructor will also go into some depth on selected topics within special and general relativity, astrophysics, and game theory. Students will learn how to solve specific types of problems on these and other topics that will be tested on daily quizzes and the final exam.

## Grading:

45% Final Exam

30% Quizzes at the beginning of class

15% Papers (3) due on each Monday. Each student will present their paper in 5 minutes.

However, the grade is based on just the paper, not the presentation.

10% Class Participation

## Important Dates:

Monday, July 16, 2017 – 1st paper due.

Monday, July 23, 2017 – 2nd paper due.

Monday, July 30, 2017 – 3rd paper due.

Thursday, August 2, 2017 – Final exam in our usual classroom, 9 a.m. to 12 p.m.