

# 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 p.m., Monday through Friday, July 11-August 2, 2017, in Physics 047. The final exam is on August 3, 2017, from 9 a.m. to 12 p.m., in Physics 047.

## Office Hours:

Every day after class, from 12 p.m. to 1 p.m. (or until everyone leaves), in Physics 047. 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 10-20 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 the final exam.

## Grading:

30% Class Participation  
30% Three 10-20 page essays  
40% Final Exam

## Important Dates:

Monday, July 17, 2017 – 1st paper due.  
Monday, July 24, 2017 – 2nd paper due.  
Monday, July 31, 2017 – 3rd paper due.  
Thursday, August 3, 2017 – Final exam in our usual classroom, 9 a.m. to 12 p.m.