AMATH 475/675/PHYS 476 Introduction to General Relativity
Winter 2018

Lectures:
Mo, We, Fr 12:30 pm - 1:30 pm, MC 2038
Tutorials:
Mo 5:00 pm - 7:00 pm, E2 1303

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Office hours:
Thursdays at 4:00pm

Purpose. The goal of the course is to give an introduction to Einstein's theory of general relativity, starting form the symmetries of spacetime and culminating in a discussion of several simple predictions of the theory (Black holes, Comsology, etc). The differential geometry and tensor analysis that is needed to formulate the theory will be developed in the first part of the course.

Texts.

E. Martín-Martínez notes (main reference). https://sites.google.com/site/emmfis/teaching/amath475.

Robert Wald *General Relativity*, University of Chicago press (2016).

Course website. https://sites.google.com/site/emmfis/teaching/amath475

Grading Scheme.	Assignments	1/3
	Midterm Exam	1/3
	Final Exam	1/3

Assignments. Homework assignments will be posted on the course website as announced in class. *there will be no make-up assignments for any reason, and no late assignments will be accepted.*

Tentative Schedule.

Block	Topic
1	The road to general relativity: Mach's relativity principle. The Galilei group. The Poincare group and Special Relativity.
2	Introduction to Differential Geometry .
3	The postulates of General Relativity.
4	Energy Conditions.
5	Global structure of spacetime
6	Examples of solutions of Einstein's equations : Black holes, FRW cosmologies, Warp drives.

Academic Integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility.

[Check http://www.uwaterloo.ca/academicintegrity/ for more information.]

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4, http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm.
When in doubt please be certain to contact the department's administrative assistant who will provide further assistance.

Discipline: A student is expected to know what constitutes academic integrity to avoid committing academic offenses and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, academic advisor, or the undergraduate associate dean. For information on categories of offenses and types of penalties, students should refer to Policy 71, Student Discipline, http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm.
For typical penalties check Guidelines for the Assessment of Penalties, http://www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm.

Appeals: A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72, Student Appeals, http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm.

Note for students with disabilities: The Office for Persons with Disabilities (OPD), located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the OPD at the beginning of each academic term.