Abbreviated Syllabus for Ma 430: Mathematical Models in Physics

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Contact Hours:
(1.) Wed. and Fri. 8am-9am in the MLC (Ha 244)
(2.) Mon. 8-9am in Hillsbourough Building 201
(3.) email, I usually check several times a day.

Lectures: T-TH 11:45-1:00, Ha 263
Prerequisites: MA 341 or 301; and MA 405.

Tentative Plan of Lectures:

1 day - repeated index convention and vector calculus
2 day - Maxwell's equations, integral verses differential formulations
2 days - Euclidean geometry
1 day - Newton's Laws, forces
5 days - Mathematics of Special Relativity
2 days - multilinear algebra and tensor products
3 days - wedge product and determinants
1.5 days - differential forms
1.5 days - Hodge duality
2 days - exterior derivatives
1 day - Potentials and Electromagnetism
2 days - Maxwell's equations via forms
2 days - integration on forms
2 days - generalized Stoke's Theorem.

Grading:

· 5% Class Participation (finding errors and asking questions)
50% Homework (done in teams of upto 3 people)
15% Test One (date TBA)
15% Test Two (date TBA)
15% Final Exam, (December 12 8-11am in Ha 263.)

Attendance: strongly recommended.

Homework Policies: points will be deducted if late, 10% per day. I will make exceptions to this policy if you have extenuating circumstances. Also I'd like you to choose one or two people to do homework with, just one homework will be graded per team. Each member should participate in the completion of each problem. Also I'd like you to indicate who wrote the homework that is turned in. Members should rotate the write-ups so that everyone writes an equal number of problems (approximately). The homework in this course can be very difficult if you try to do a problem the wrong way, please ask me if you get stuck. Also don't hesitate to ask for clarification of the assignments if they seem unclear. Email is perfectly fine for most questions, generally if I email a hint to someone I'll email it to everybody.