SYLLABUS: MTH 412/512 Real Analysis
3 credits, 9:00-9:50am MWF, Winter 2018, Classroom: TBA

Instructor: Professor Mary Brown, Kidder 4XX, mary.brown@oregonstate.edu
Office hours, MW 10:30-11:30am, F 1:30-2:30pm, and by appointment.

Catalog Description for MTH 412/512: Measure and integration theory, basic convergence theorems, Lebesgue spaces, Fubini’s theorem, Radon-Nikodym theorem, and applications. Banach spaces including Baire category theorems, and Hilbert spaces.

Enforced Prerequisites for MTH 412: MTH 411.

Course Content: This course is the second in a 3 term sequence in real analysis. It is assumed that students have successfully completed the previous class in the sequence. The goal of the course is to continue a systematic introduction to real analysis, including: Measure and integration theory, basic convergence theorems, Lebesgue spaces, Fubini’s theorem, Radon-Nikodym theorem, and applications. Banach spaces including Baire category theorems, and Hilbert spaces.

The Learning Outcomes expected for students enrolled in this class are as follows.

Students satisfactorily completing MTH 412 should be able to:

- Apply the definitions and theorems of real analysis to construct correct, thorough, and efficient mathematical arguments in the context of real-valued functions and the course content outlined above.

Students satisfactorily completing MTH 512 should be able to:

- Apply the definitions and theorems of real analysis to construct correct, thorough, and efficient mathematical arguments in the context of real-valued functions and the course content outlined above.

Required Textbook: Real Analysis by N.L. Carothers, Cambridge University Press.

Class plan: New material will be covered in lecture daily with weekly homework assignments.

Homework is an important component of the class. It will typically be assigned on Friday and collected the following Friday. Assignments will be announced in class and posted on Canvas. Students are encouraged to discuss problems with other students, but all homework submitted is expected to be written independently. It is also expected that submitted homework is either typeset or written clearly and legibly. Late homework submission is strongly discouraged.

Examinations: There will be one in-class midterm, date TBA, and a comprehensive final exam. There will be no make-up exams.

Mastery of the learning outcomes will be assessed for each student via evaluation of homework and examinations. Evaluation of MTH 412 students will be differentiated from that of MTH 512 students. Typically, the MTH 412 students will have shorter assignments, and/or parts of some problems will be less complex. The additional problems provided for MTH 512 students will require deeper understanding and more advanced reasoning.

Grade assignments for the class will be based on the following allocation.

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>Homework</td>
<td>150 points</td>
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<tr>
<td>Midterm</td>
<td>150 points</td>
</tr>
<tr>
<td>Final Exam</td>
<td>200 points</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>500 points</strong></td>
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Statement Regarding Students with Disabilities: Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at http://ds.oregonstate.edu. DAS notifies students and faculty members
of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details.

Link to Statement of Expectations for Student Conduct, i.e., cheating policies http://studentlife.oregonstate.edu/code