UAF & DMS SYLLABUS GUIDELINES FOR MATH252X – CALCULUS II

Across all sections of Calculus II offered by UAF campuses (delivered in-person or online), all syllabi must satisfy the following requirements.

1. General guidelines set by UAF; follow this link to UAF syllabus requirements

2. Content
   - *Calculus: Early Transcendentals* (for Calculus I-III) or *Single Variable Calculus: Early Transcendentals* (for Calculus I-II) by James Stewart, 8th edition is the textbook adopted by DMS and must be used for the course.
   - All of the required (r) sections from the textbook listed below must be covered. Optional (o) topics should be considered as time permits.
     - Chapter 6: 6.1-6.5 (r)
     - Chapter 7: 7.1-7.5 (r), 7.6 (o), 7.7-7.8 (r)
     - Chapter 8: 8.1-8.3 (r), 8.4-8.5 (o)
     - Chapter 9: 9.1-9.6 (o)
     - Chapter 10: 10.1-10.4 (r), 10.5-10.6 (o)
     - Chapter 11: 11.1-11.11 (r)

3. Prerequisites
   - Placement into MATH252X is by passing MATH251X with a grade of C- or better, or earning a 4 or 5 on the AB or BC AP Calculus exam. Students who have not met the current placement requirements within the last two years will be dropped within the first two weeks of the course.

4. Types of assessments
   - Exams
     - at least two midterm exams during the semester
     - exams must be timed, proctored, closed book, closed notes, and no calculators
     - exams must be majority written answer (not multiple choice)
     - exams must be pencil-and-paper exams, written and graded by a faculty member
     - exams should not be reused from previous semesters, limited reuse of edited problems is acceptable
   - Final exam
     - must be cumulative and representative of the entire course
     - must include problems from each of the Assessment Criteria listed on the next page
   - Other Assessed Work
     - instructors should provide written feedback to students approximately weekly throughout the semester.
     - This can be through humanly-graded assignments or email correspondence
     - students must have a mechanism for estimating their current grade in the course
     - there must be human feedback prior to the first exam

5. Grading Policy
   - The syllabus must include a grading scale in some form.
   - Plus/minus grading is at the discretion of the instructor, but must be stated explicitly.
   - The final grade in this course must adhere to the following:

<table>
<thead>
<tr>
<th>Assessed Work</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written Assessed Work</td>
<td>At least 15% and at most 30%</td>
</tr>
<tr>
<td>Online Assessed Work</td>
<td>At most 15%</td>
</tr>
<tr>
<td>Midterm Exams</td>
<td>At most 15%</td>
</tr>
<tr>
<td>Comprehensive Final Exam</td>
<td>At least 20%</td>
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</tbody>
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Assessment criteria

Final exams should contain problems that demonstrate the students’ acquired knowledge of the following topics.

- **Techniques and Applications of Integration**
  - All required techniques of integration (integration by parts, trigonometric integration, trigonometric substitution, partial fractions) should be tested, though it is not desirable to do this entirely through simple ‘do this integral’ problems. Integration techniques show up naturally in setting up and carrying out applications problems.
  - Numerical integration
  - At least three problems should address applications of integration. These applications might include area between curves, volumes, centroid, average value, surface area, and the use of integrals in fields like physics, engineering, or biology.
  - At least one problem should include the setting up or evaluation of an improper integral.

- **Infinite Sequences and Series**
  - Definition of sequences and ability to compute limits of sequences should be tested on the final.
  - Problems that assess students’ knowledge of tests for the convergence or absolute convergence of a series should be on the final.
  - Computing Taylor series and/or Maclaurin series for a function \( f(x) \).
  - Approximating a function \( f(x) \) using a Taylor polynomial should be on the final, and an ability to give a bound on the error.

- **Parametric Equations and Polar Coordinates**

Final exams will be evaluated by the Core Assessment Committee based on the described desired outcomes for the course. Six questions on the exam corresponding to six of the items or subitems above will be chosen for closer review. The overall content of the exam and students’ ability to write proper mathematics will also be assessed.