Historical Note:
After 1542, candidates for the Master of Arts degree at the University of Paris had to take an oath that they had read the first 6 books of the Elements

Pre-Requisite: Math 307

Time: MWF 11.10 – 12:00
Place: M 306
Instructor: Dr. Sriraman
Office: Math 301
Office Hours: MWF: 9.10-10.00
Phone & E-mail: 243-6714; sriramanb@mso.umt.edu

Texts: Thirteen Books of Euclid's Elements. Text is provided free as a pdf file.

What are The Elements?
Some Definitions, 5 Common notions and 5 Postulates to deduce an orderly chain of 467 theorems!

Other Material: Compass, protractor and straightedge. Geometer's Sketchpad.

Learning Outcomes: Upon completion of this course, a student will be able to:
☐ Construct mathematical proofs using the axioms of Euclidean geometry;
☐ Explore, conjecture, and prove mathematical ideas and theorems;
☐ Develop a facility with geometric theorems and proofs, through hands-on exploration;
☐ Explain different geometries and their development, through comparisons of their axioms, and the validity of basic theorems in different geometries.

To further the learning outcomes this is the course agenda:

Agenda: We will survey different geometries with a firm basis in axiomatic Euclidean geometry.
The following topics will be covered
Geometry Explorations/Constructions using Sketchpad
Geometry and Numbers
Axiomatic Euclidean Geometry
Various Non-Euclidean Geometries such as
- Spherical Geometry
- Fractal Geometry [time permitting]

Important Dates:

<table>
<thead>
<tr>
<th>Dates</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 31, 2015</td>
<td>Autumn classes begin</td>
</tr>
<tr>
<td>September 7, 2015</td>
<td>Labor Day Holiday – no classes, offices closed</td>
</tr>
<tr>
<td>November 11, 2015</td>
<td>Veteran’s Day Holiday – no classes, offices closed</td>
</tr>
<tr>
<td>November 25, 2015</td>
<td>Student Travel Day – no classes</td>
</tr>
</tbody>
</table>
November 26 – 27, 2015  Thanksgiving Break – no classes, offices closed
December 14 – 18, 2015  Final Examinations

For detailed Add/Drop dates and deadlines, refer to the last page of this syllabus

Other Information:

_Academic misconduct_ is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. Academic misconduct is defined as all forms of academic dishonesty and the Student Conduct Code. In particular, Student Conduct Code Section IV.a.5 identifies the following violations: Submitting false information: Knowingly submitting false, altered, or invented information, data, quotations, citations, or documentation in connection with an academic exercise

_Students with disabilities_ may request reasonable modifications by contacting me. The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students (DSS). “Reasonable” means the University permits no fundamental alterations of academic standards or retroactive modifications. For more information, please consult [http://www.umt.edu/disability](http://www.umt.edu/disability)

**Grading Distribution:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sketchpad Activities</td>
<td>100</td>
</tr>
<tr>
<td>In Class contributions</td>
<td>100</td>
</tr>
<tr>
<td>2 Mid-term exams</td>
<td>200</td>
</tr>
<tr>
<td>Final exam</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>500</strong></td>
</tr>
</tbody>
</table>

**Grading Scale:** 90-100 A ; 80-89.9 B ; 70-79.9 C ; 60-69.9 D ; Below 60 F

**Sketchpad Activities**

Sketchpad activities allow for a dynamic and empirical exploration and discovery of various invariant properties of objects in Euclidean geometry. Explorations and results are to be documented in a journal (a folder), which will be periodically examined. The format for each journal entry is as follows. Most of the sketches will be made available to you via Moodle.

A.  Statement of problem (Date)

B.  Investigation  [Question # Answer #]

C.  Deductive Proof /Reflection : A proof of the discovered result and a paragraph summary of what you have found through your Sketchpad investigation.
In class contributions
The only way to become proficient at proofs is to write and present a lot of them. Proof in the mathematics community is a “social” activity. One presents ideas and subjects them to scrutiny. Students will be assigned to groups of 2-3 and will read/present various proofs from the Books of the Elements. This may seem intimidating at first but with time, students will become comfortable and proficient. Students will also be accountable for the assigned readings and classroom participation.

3. Mid-terms and Final
Mid-terms 1 and 2 will be given approximately 1/3 and 2/3, respectively, of the way through the semester. The final will be cumulative in the traditional sense. It will be longer than the mid-term exams and will feature some questions relating directly to material taught earlier in the course. I will assign one mid-term (as a take home) over Moodle.

SOME “FREE” ADVICE
Factors that affect your grade
- Homework: There will be homework assigned on a regular basis in the form of Sketchpad Activities and readings from the Elements, which will be reviewed periodically in class. It is your prerogative to keep up with the material.
- Attendance: Students are expected to attend class, and although class attendance is NOT a component of the course grade, absences will impact your performance since you will miss the material covered in the lectures. Late assignments will not be accepted.
- Make-ups: THERE ARE NO MAKE-UPS regardless of the reason. Exam make-ups will ONLY be given under special and extenuating circumstances, such as a death in the family or illness, provided that: a note from the Health Service or doctor is furnished by the student AND permission is given by me prior to the exam. The final exam is compulsory and no exceptions can be made about the date/time at which it is held- this is decided a priori by the University Administration.

The Final Exam is scheduled for Thursday, December 17th, 8.00-10.00
## Autumn 2015 Registration Deadlines

<table>
<thead>
<tr>
<th>Instructional Days</th>
<th>August 31 – Sept. 9 @ 5pm</th>
<th>September 10 – Sept. 21 @ 5pm</th>
<th>September 22 – November 2 @ 5pm</th>
<th>November 3 – December 11 @ 5pm</th>
<th>December 12 &amp; Beyond</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instructional Days</strong></td>
<td>Day 1 – 7</td>
<td>Day 8 – 15</td>
<td>Day 16 – 45</td>
<td>Day 46 – Last Class Day Before Finals</td>
<td>After Last Regular Class Day</td>
</tr>
<tr>
<td><strong>Add a Course</strong></td>
<td>CyberBear</td>
<td>Registration Override (paper or electronic) with instructor signature</td>
<td>Course Add/Change Form(^1) with advisor(^2) &amp; instructor signatures + $10.00 fee</td>
<td>Course Add/Change Form(^1) with advisor(^2) &amp; instructor signatures + $10.00 fee</td>
<td>Only to fix registration errors (see reg. counter)</td>
</tr>
<tr>
<td><strong>Drop a Course(^3)</strong></td>
<td>CyberBear</td>
<td>CyberBear</td>
<td>Course Drop Form with advisor(^2) &amp; instructor signatures + $10.00 fee (W on transcript)</td>
<td>Course Drop Form with advisor(^2), instructor, &amp; Dean’s signatures + $10.00 fee (WP or WF on transcript)</td>
<td>Not permitted</td>
</tr>
<tr>
<td><strong>Switch Sections</strong></td>
<td>CyberBear</td>
<td>Registration Override (paper or electronic) with instructor signature to add; CyberBear to drop</td>
<td>Course Add/Change Form with both instructors’ signatures</td>
<td>Course Add/Change Form with both instructors’ signatures</td>
<td>Only to fix registration errors (see reg. counter)</td>
</tr>
<tr>
<td><strong>Credit/No Credit Grading Option</strong> (change to or from)</td>
<td>CyberBear</td>
<td>CyberBear</td>
<td>Course Add/Change Form with advisor(^2) &amp; instructor signatures</td>
<td>Course Add/Change Form with advisor(^2) &amp; instructor signatures</td>
<td>Not permitted</td>
</tr>
<tr>
<td><strong>Adjust Variable Credit Load</strong> (variable credit courses only)</td>
<td>CyberBear</td>
<td>CyberBear</td>
<td>Course Add/Change Form with advisor(^2) &amp; instructor signatures</td>
<td>Course Add/Change Form with advisor(^2) &amp; instructor signatures</td>
<td>Not permitted</td>
</tr>
<tr>
<td><strong>Audit</strong> (change to or from)</td>
<td>CyberBear</td>
<td>CyberBear</td>
<td>Not permitted</td>
<td>Not permitted</td>
<td>Not permitted</td>
</tr>
</tbody>
</table>

For assistance or questions about registration deadlines, please call the Office of the Registrar at (406) 243-2995 or email registration@umontana.edu.

---

1. Starting September 21\(^{st}\) after 5pm, anyone not successfully registered for at least one credit or is re-registering after cancellation must instead petition to late register.
2. Advisor’s signature not required for Graduate & Post-Baccalaureate students.
3. Courses dropped after September 21\(^{st}\) result in a “W”, “WP”, or “WF” on the student’s transcript, do not generate a refund, and may affect financial aid eligibility. If all courses are dropped, the Semester Withdrawal policy must be followed. See Business Services for Semester Withdrawal partial refund eligibility by September 21.