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BIOM 1702: Biomedical Engineering Visualization (Syllabus)

Aaryani Sajja
University of Memphis

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BIOM 1702: Syllabus

Course Information

This course is designed to help you improve your spatial visualization skills. Spatial skills are important to success in many careers, and are particularly important for engineering and technological careers. Spatial skills are not usually taught in high school; however, spatial skills can be developed through practice. Studies have shown that students with improved spatial skills earned better grades in engineering and science courses.

Course Learning Objectives

At the end of the course, students will be able to:

- Apply spatial visualization skills including topological, projective, and Euclidian skills
- Be able to sketch isometric drawings, orthographic projections, and sectional views
- Use sketches (or engineering drawings) to communicate information effectively
- Use or become familiar with computer-aided drafting tools to create engineering drawings

Prerequisites or Co-requisites

MATH 1720 or MATH 1730 or MATH 1910 or ENGR 1010 with a grade of C- or better.

Course Topics

- 2D rotations/solids of revolution
- Combining solids
- Isometric sketching
- Orthographic projections
- Inclined and curves surfaces
- Rotations about 1 and 2 axes
- Reflections and symmetry
- Cutting planes and cross sections
- Assembly

Instructor

Dr. Aaryani Sajja, aaryani.sajja@memphis.edu, 901-678-3772

Office hours: By appointment, schedule via email.

Open door policy: My office location is ET321C. Feel free to stop by anytime for quick questions. If you have in-depth questions, please email to make an appointment.

Teaching Assistant

Hayden Johnson, htjhanson@memphis.edu

Textbooks, Supplementary Materials, Hardware and Software Requirements

Required Textbooks

No textbook is required for this course.

Supplementary Materials

No supplementary materials are required, but using cubic blocks as visualization tools can be helpful. "Snap cubes" are recommended and can be purchased through Amazon.com or other retail sites. About 30 cubes are sufficient.

Hardware and Software Requirements

The Herff College of Engineering minimum requirements can be found at <https://www.memphis.edu/herff/students/index.php> (Links to an external site.).

You must access the **Spatial Vis** app to complete sketching assignments. You will receive an email invitation during the first week of the term to set up your account to access the Spatial Vis app.

Assessment and Grading

Testing Procedures

The final exam will be administered via the Quizzes feature. The final exam will be available for a 24-hour period. The final exam will be timed.

Grading Procedure

10% Attendance & Participation

20% Quizzes

20% Sketching

15% Fusion 360

15% Final exam

20% Design Project

3% Extra credit

Grading Scale

90-100--A-/A/A+

80-89---B-/B/B+

70-79---C-/C/C+

60-69---D-/D/D+

Assignments and Participation

Assignments and Projects

Participation (10%): Complete polls and sketches during class lectures for participation credit. Poll questions are embedded in the lectures to help prepare for weekly quizzes. Sketches are assigned at the end of lectures. Correct answers are not required for full credit, but an answer must be submitted for each question.

Quizzes (20%): Access Quizzes from the Assessments tab, or under Content modules. Correct answers are required for full credit, but some partial credit is awarded in some types of questions. Quizzes are weighted evenly in the Quizzes category. Quizzes are untimed, and you may take up to 2 attempts. Weekly quizzes should be completed sequentially. Complete the PSVT quiz first to gain access to Weekly quizzes and other content. You can work at your own pace, but you should complete the assigned quizzes each week.

Design Project (20%): The design project will be a high-quality hand-drawn sketch and computer-aided drawing (CAD) of a design concept (usually from BIOM 1701).

Sketching (20%): Assignments in modules 1-9 of the Spatial Vis app are used for sketching assessments. The odd numbered problems plus the 3 test problems at the end of the module are required. You must earn at least 2 stars on each odd problem to receive credit (hints available), and 3 stars on the test problems (no hints available).

Fusion 360 (15%): Sketching assignments will be assigned to be completed using Fusion 360 software. Short 5-minute demos will be uploaded on to Canvas for reference.

Extra credit: Up to 3% extra credit will be given for even numbered Spatial Vis app problems with 3 stars (no hints).

Class Participation

Participation is required in all class meetings. Check the course news items frequently for announcements. Students are expected to communicate with the instructor and teaching assistant as a learning resource.

Punctuality

You may progress through the material at your own pace, but also must meet assignment deadlines. These deadlines are necessary to provide timely feedback.

Course Ground Rules

1. Collegial and professional behavior is expected. Specifically, we will create a collaborative, respectful, mindful, and sociable environment.
2. There will be regular activities and assignments. You are expected to complete and understand all activities and assignments, whether they are graded or not.
3. Except when teamwork is specifically required, any work submitted for a grade must be your own original work. Working together on assignments and quizzes is acceptable and encouraged, but each person must submit their own work. Do not electronically share your assignment files with classmates.
4. You are responsible for determining the availability of the computing resources used in this class and for scheduling your work accordingly. See Herff College of Engineering computer requirements: <https://www.memphis.edu/herff/students/index.php> (Links to an external site.).
5. You must fully comply with all university guidelines and applicable laws regarding the use of computing facilities and software that may be provided for this course.

Guidelines for Communication

Office Hours

Dr. Aaryani Sajja, aaryani.sajja@memphis.edu, 901-678-3772

Virtual office hours: By appointment, schedule via email or through
Navigate: <https://memphis.campus.eab.com/home> (Links to an external site.)

Open door policy: My office location is ET321C. Feel free to stop by anytime for quick questions. If you have in-depth questions, please email to make an appointment.

Teaching Assistant: Hayden Johnson, htjhanson@memphis.edu

Email

- Always include a subject line.
- When sending email to your instructor, include the text 'BIOM 1702' in the subject line and your first and last name in the body of the message. If the aforementioned text does not appear in the subject line, your email may be disregarded and/or deleted. As a courtesy, please begin your email with "Dear/Hello Dr. Sajja".
- Remember, without facial expressions, some comments may be taken the wrong way.
- Be careful in wording your emails. Use of emoticons might be helpful in some cases.
- Use standard fonts.
- Do not send large attachments without permission.
- Special formatting such as centering, audio messages, tables, html, etc. should be avoided unless necessary to complete an assignment or other communication.
- Respect the privacy of other class members

Plagiarism and Integrity

Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students guilty of academic misconduct, either directly or indirectly, through participation or assistance, are immediately responsible to the instructor of the class in addition to other possible disciplinary sanctions which may be imposed through the regular institutional disciplinary procedures. Expectations for academic integrity and student conduct are described in detail on the website of the [Office of Student Accountability \(Links to an external site.\)](#). Please read in particular, the section about "[Academic Misconduct \(Links to an external site.\)](#)".

Library, Tutoring, and Other Resources

- The myMemphis Portal system, eCampus Student tab provides access to [University library \(Links to an external site.\)](#).
- The tutoring link in the course navigation bar provides access to free online tutoring through UpSwing.
- The LinkedIn Learning link in the course navigation bar provides free access to thousands of video tutorials.
- Other support services are available through the Educational Support Program.

Students With Disabilities

Qualified students with disabilities will be provided reasonable and necessary academic accommodations if determined eligible by disability services staff at the University of Memphis. Prior to granting disability accommodations in this course, the instructor must receive written verification of a student's eligibility for specific accommodations from the disability services staff. It is the student's responsibility to initiate contact with [Disability Resources for Students \(Links to an external site.\)](#)(DRS) and to follow the established procedures for having the accommodation notice sent to the instructor.

Sexual Misconduct and Domestic Violence Policy

This policy specifically addresses sexual misconduct which includes dating violence, domestic violence, sexual assault, and stalking. The policy establishes procedures for responding to Title IX-related allegations of sexual misconduct. Complaints can be reported to the Office for Institutional Equity (OIE). The OIE office is located in the Administration Building, Room 156. You may contact the OIE by phone at 901.678.2713 or by email at oie@memphis.edu. Complaints can be submitted online at [File a Complaint \(Links to an external site.\)](#).

Non-Discrimination and Anti-Harassment Policy

University policy prohibiting discrimination and harassment based on protected characteristics and classes. Complaints of discrimination and harassment can be reported to the Office for Institutional Equity (OIE). You may contact OIE by phone at 901.678.2713 or by email at oie@memphis.edu. The full text of the policy can be found at [GE2030 - NONDISCRIMINATION AND ANTI-HARASSMENT \(Links to an external site.\)](#).

Technology Requirements

The following is a list of the minimum requirements to use our learning management system. Some courses will have more advanced requirements.

- Access to a reliable, high-speed Internet connection.
- Test your device to ensure it is compatible with our LMS (Learning Management System) using the System Check Wizard.
- Open PDF files using the free downloadable software at Adobe Acrobat Reader DC.
- Access Flash-based content with [Adobe Flash Player \(Links to an external site.\)](#) (free).
- Use Microsoft Office Software for Faculty, Staff, and Students for document creation.
- Play media content with [Real Player \(Links to an external site.\)](#) (free). [Quick Time \(Links to an external site.\)](#) (free), or [Windows Media Player \(Links to an external site.\)](#)(free). (available for students via <http://umapps.memphis.edu/> (Links to an external site.))

Syllabus Changes

The instructor reserves the right to make changes as necessary to this syllabus. If changes are necessitated during the term of the course, the instructor will immediately notify students of such changes both by individual email communication and posting both notification and nature of change(s) on the course bulletin board.

Technical Support

Call the Helpdesk: (901) 678-8888

[Online Helpdesk \(Links to an external site.\)](#): To report an issue or request assistance, contact umTech - Information Technology Services.