

DAKOTA HIGH SCHOOL

ENGINEERING DESIGN – COURSE SYLLABUS

Instructor: Mr. Scott E. Mitchell
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Website: www.dakotadesigntech.com
Classroom #: 163

Office Hours: 2:30 – 3:00
Planning Room: 160
Telephone Number: (586) 723-2856

Length: 2 Hours - 1 Year

Credit: 2.0

Text: Technical Drawing, 13th Edition, Giesecke and Mitchell
Jig and Fixture Design, 4th Edition, Edward Hoffman
Machinery's Handbook, 26th Edition, Erik Oberg and Franklin D. Jones

Software: AutoCAD 2019, Inventor 2019, SolidWorks 2015 and MS Office Products

COURSE DESCRIPTION

In this third year course, students take an advanced look at the engineering design profession. This is accomplished by applying professional Design concepts, engineering problem solving, and visual graphic techniques while maintaining professional ethics, and responsibility. Students will be introduced to design theory of basic machine elements through the introduction of dies, jigs and other industrial applications. Students will accomplish typical industry design practices including the preparation of complete production tool designs using the CAD system. The theory of detail design procedures will be the focus by means of the latest design methods, technical skills, industrial applications, and practices of mechanical assembly. Topical areas may include; bill of materials, subassemblies, standard parts, fasteners, dimensioning, visualization and advanced 3-dimensional CAD techniques. Students will incorporate rapid prototyping technology for model design, analysis and verification of a fully defined new part. The building of simple projects will be included in the course experience while maintaining personal safety in the fabrication lab.

METHODOLOGY

The course includes lectures, discussions and laboratory sessions. Assignments in general knowledge, projects and drawings are to be worked on independently or cooperatively, as assigned. Students will make extensive use of the CAD and Fabrication labs to complete their assignments.

PREREQUISITES

Mechanical Design 1A/1B with at least a "C" grade and/or instructor approval and pass AutoCAD Proficiency Test.

CURRICULUM OUTLINE

- Proposal Sketching
- Lettering
- Threads and Fasteners
- Tolerancing
- AutoCAD Level III
- Working Drawings
- Fab Lab Projects
- Jig and Fixture Design
- Inventor Level III (*Solid Modeling and Assemblies*)
- Professional Portfolio Development
- Resource Materials
- Prototyping

SUPPLIES FOR CLASS (provided by instructor)

- 1 ½" Black three ring, clear view binder with dividers.
- Mechanical Series Pencils - .7mm
- Flash Drive (recommended but not provided)

PROJECT FEES / ASSOCIATED COSTS

Students are not charged lab fees associated with projects as all materials and supplies are normally funded by the CTE department of Chippewa Valley Schools. Students may incur additional costs for specific projects that go above and beyond the standard scope of the original project. These costs apply if they choose to pursue fabrication capabilities or parts supplies outside of the fabrication lab.

EVALUATION and ASSESSMENT

Students will be evaluated and assessed by: written testing, oral presentations, demonstrations, participation, and hands-on performance (drawing on the computer). Students will also give a self-evaluation.

GRADING SCALE

A	100 -95	B-	83 - 80	D+	69 - 67
A-	94 - 90	C+	79 - 77	D	66 - 64
B+	89 - 87	C	76 - 74	D-	63 - 60
B	86 - 84	C-	73 - 70	F	59 & Below

- **Extra Credit Policy:**
 - If original credit is complete then extra credit will be provided. 10% of the total points available is the maximum allotted extra credit.
- **Homework Policy:**
 - Lab work, in-class work and appropriate in-class time is supplied for assignments due to the nature of curriculum delivery. All "home" work assigned will have fully defined due dates and criteria.
- **Late Work Policy:**
 - All late work will be penalized 20% per day late. No work will be accepted after 5 days.
- **Reassessment Policy:**
 - Daily lab assignments develop mastery of knowledge and may be resubmitted for grade improvement. Actual assessments or project based learning assessments are singular events.
- **Testing Reference Material:**
 - All student resources may be available for test taking, such as; binder portfolios, notes, prior work, industry reference materials.

ACADEMIC INTEGRITY POLICY

The primary rule in this professional class is **RESPECT**. It applies to all aspects of the class. If you are wondering if something is allowed or will be tolerated ask yourself where the word respect is involved in the action. Remember, this class is a privilege - not a requirement.

The following actions will not be tolerated whatsoever and will be cause for permanent removal with a failing grade from this design technology program. These rules and guidelines are in addition to the school handbook and district policies.

- **Cheating / Academic dishonesty in any form.**
 - Examples:
 - Taking someone else's work and using it for your own / sharing your work.
 - Copying or allowing copying of CAD files / Drawings.
 - Tampering with someone's project or work.
 - Deleting files from other student's directory.
- **Destruction of lab equipment of any form.**
 - Examples:
 - Cutting or damaging the workstation surface.
 - Damaging the PC and any of its components.
 - The damage, removal / disassembly of any part of the lab furniture, or any part of the PC and its components including wires and cables.

Unauthorized Internet usage could result in **permanent removal of computer privileges** in the lab. Internet usage will only be allowed upon instructor approval. **A failing grade in all CAD work will result without the use of a computer.**

Unauthorized software application use or installation will result in **permanent removal of computer privileges** in the lab. **A failing grade in all CAD work will result.**

Unauthorized access to the inner workings of the software of the PC system (**hacking**) or installing any software, changing the background of the desktop, changing the computer time or date, installing games, using the network for unauthorized communication or storage, or accessing the C: drive will result in **permanent removal of computer privileges** in the lab. **A failing grade in CAD work will result.**

ATTENDANCE

Active attendance in the class is a valuable and integral part of the student's grade. Attendance in school is the responsibility of the student and his/her parents or guardian. Attendance has a bearing on academic achievement and will reflect in a student's grade. Excessive absence or tardiness, whether excused or unexcused, can result in a failing grade during the marking period or semester.

STATE OF MICHIGAN CTE SEGMENTS

- 9 – Engineering Drawings
- 10 – Manufacturing Process
- 11 – Engineering Design Concepts
- 12 – Research and Development Applications

ARTICULATION COURSE CREDIT FOR POST-SECONDARY INSTITUTIONS

The following schools offer course credit through an articulation agreement after successfully completion of the Design Technology Course Program. (CIP 15.1306) Each post-secondary school has detailed course requirements needed in order to earn credits in their specific program of study. (Similar to Advanced Placement credits)

- *Macomb Community College*
- *Oakland Community College*
- *Henry Ford Community College*
- *Davenport University*
- *Ferris State University*

NOTICE OF NONDISCRIMINATION It is the policy of Chippewa Valley Schools not to discriminate on the basis of race, color, religion, national origin or ancestry, gender, age, disability, height, weight or marital status in its programs, services, activities, or employment. Inquiries related to nondiscrimination policies should be directed to: Civil Rights Coordinator, Assistant Superintendent of Human Resources, Chippewa Valley Schools Administration, 19120 Cass Avenue, Clinton Township, MI 48038 Phone: 586-723-2090 / Nondiscrimination inquiries related to disability should be directed to: Section 504 Coordinator, Director of Special Services, (same address) Phone: 586-723-2180