



**MENG 4320 – Design for Manufacturing**

**Course Syllabus**

<b>Semester / Year</b>	Fall / 2023
<b>Catalog Description</b>	Design principles for achieving quick, low cost product introduction through consideration of cost, quality, reliability, maintainability, appearance and ergonomics; consideration of the interaction between design, materials, and method of production. Three hours of lecture per week.
<b>Prerequisites</b>	MENG 3319: Materials Science and Manufacturing.
<b>Section Number</b>	001 and 040
<b>Instructor Name</b>	Dr. Shih-Feng Chou
<b>Contact Information</b>	3900 University Blvd., RBN 3005, Tyler TX. 75799 Phone: 903-566-6209 Email: <a href="mailto:schou@uttyler.edu">schou@uttyler.edu</a>
<b>Class Type / Instruction Mode / Location</b>	001: f-2-f / RBN 2012 040: synchronized Zoom / HEC C203
<b>Class Time</b>	TuTh 3:30 – 4:50 PM
<b>Office Hours</b>	TuTh 10 – 11 AM and We 1 – 2 PM or by appointment. Zoom: 925-6590-6631 (#800165).
<b>No. of Credits</b>	3
<b>Required Textbook</b>	N/A
<b>Optional References</b>	1. Manufacturing and design: Understanding the principles of how things are made, E. Tempelman, H. Shercliff, and B.N. van Eyber, 1st Edition. 2. Product Design for Manufacture and Assembly, G. Boothroyd, P. Dewhurst, and W.A. Knight, 3rd Edition. 3. Class Handouts via Canvas.
<b>Additional Rules and Requirements</b>	N/A
<b>Evaluation Method</b>	Homework: 40% Exams: 60%



<b>Grading Policy / Scale</b>	Letter grades, scale: A: 90 – 100, B: 80 – 89, C: 70 – 79, D: 60 – 69, F: < 60																																																																				
<b>Important Events / Dates</b>	9/1/2023 (Fr): Census Date. 9/19/2023 ~ 9/21/2023: 1 <sup>st</sup> Exam. 10/17/2023 ~ 10/19/2023: 2 <sup>nd</sup> Exam. 10/30/2023 (Mo): Last day to withdraw from one or more classes. 11/28/2023 ~ 11/30/2023: 3 <sup>rd</sup> Exam. 12/7/2023 (Tu): Make-up Exam.																																																																				
<b>Attendance / Makeup policy / other rules</b>	<ol style="list-style-type: none"> <li>Attendance will be recorded throughout the semester.</li> <li>Student with SAR status should contact the UT Tyler Office of Student Accessibility and Resources for assignment arrangements.</li> <li>All assignments must be submitted to Canvas for grading.</li> </ol>																																																																				
<b>Course Learning Objectives / ABET &amp; PEOs Relation</b>	<p>By the end of this course, students will be able to:</p> <ol style="list-style-type: none"> <li>Identify features that drive costs in casting, sheet metal forming, extrusion, forging, machining, and injection molding of parts.</li> <li>Estimate the relative tooling costs for injection molded, die cast and stamped parts.</li> <li>Estimate the relative production costs for injection molded, die cast and stamped parts.</li> <li>Determine if a part is suitable for additive manufacturing.</li> </ol>																																																																				
<b>Tentative Topics / Course Plans</b>	<p>Product Disassembly Study; Shape Casting; Sheet Metal Forming; Extrusion; Forging; Machining; Injection Molding; Thermoforming; Fiber, Resin, and Composites; Additive Manufacturing; Joining and Assembly.</p> <p><b>Course Plan:</b></p> <table border="1"> <thead> <tr> <th>Week (Date)</th> <th>Topic</th> <th></th> <th>HW</th> </tr> </thead> <tbody> <tr> <td>1 (8/22, 8/24)</td> <td>(Tu) Syllabus</td> <td>(Th) Introduction</td> <td></td> </tr> <tr> <td>2 (8/29, 8/31)</td> <td>(Tu) Product Disassembly Study</td> <td>(Th) Materials Selection</td> <td></td> </tr> <tr> <td>3 (9/5, 9/7)</td> <td>(Tu) Shape Casting</td> <td>(Th) Die Casting Analysis</td> <td>HW#1</td> </tr> <tr> <td>4 (9/12, 9/14)</td> <td>(Tu) Sand Casting Analysis</td> <td>(Th) Investment Casting Analysis</td> <td>HW#2</td> </tr> <tr> <td>5 (9/19, 9/21)</td> <td colspan="3"><b>Take-home Exam#1</b></td> </tr> <tr> <td>6 (9/26, 9/28)</td> <td>(Tu) Sheet Metal Forming</td> <td>(Th) Sheet Metal Analysis</td> <td>HW#3</td> </tr> <tr> <td>7 (10/3, 10/5)</td> <td>(Tu) Forging</td> <td>(Th) Hot Forging Analysis</td> <td>HW#4</td> </tr> <tr> <td>8 (10/10, 10/12)</td> <td>(Tu) Extrusion</td> <td>(Th) Machining</td> <td></td> </tr> <tr> <td>9 (10/17, 10/19)</td> <td colspan="3"><b>Take-home Exam#2</b></td> </tr> <tr> <td>10 (10/24, 10/26)</td> <td>(Tu) Additive Manufacturing</td> <td>(Th) AM Design Analysis</td> <td>HW#5</td> </tr> <tr> <td>11 (10/31, 11/2)</td> <td>(Tu) Injection Molding</td> <td>(Th) Injection Molding Analysis</td> <td>HW#6</td> </tr> <tr> <td>12 (11/7, 11/9)</td> <td>(Tu) Thermoforming</td> <td>(Th) Fiber, Resin, and Composites</td> <td></td> </tr> <tr> <td>13 (11/14, 11/16)</td> <td>(Tu) Joining and Assembly</td> <td>(Th) Design for Assembly</td> <td></td> </tr> <tr> <td>14 (11/21, 11/23)</td> <td colspan="3"><b>Thanksgiving Break – No Classes</b></td> </tr> <tr> <td>15 (11/28, 11/30)</td> <td colspan="3"><b>Take-home Exam#3</b></td> </tr> <tr> <td>16 (12/7)</td> <td colspan="3"><b>Final Exam: Make-up Only</b></td> </tr> </tbody> </table> <p>(Dr. Chou reserves the right to change schedule in course plan.)</p>	Week (Date)	Topic		HW	1 (8/22, 8/24)	(Tu) Syllabus	(Th) Introduction		2 (8/29, 8/31)	(Tu) Product Disassembly Study	(Th) Materials Selection		3 (9/5, 9/7)	(Tu) Shape Casting	(Th) Die Casting Analysis	HW#1	4 (9/12, 9/14)	(Tu) Sand Casting Analysis	(Th) Investment Casting Analysis	HW#2	5 (9/19, 9/21)	<b>Take-home Exam#1</b>			6 (9/26, 9/28)	(Tu) Sheet Metal Forming	(Th) Sheet Metal Analysis	HW#3	7 (10/3, 10/5)	(Tu) Forging	(Th) Hot Forging Analysis	HW#4	8 (10/10, 10/12)	(Tu) Extrusion	(Th) Machining		9 (10/17, 10/19)	<b>Take-home Exam#2</b>			10 (10/24, 10/26)	(Tu) Additive Manufacturing	(Th) AM Design Analysis	HW#5	11 (10/31, 11/2)	(Tu) Injection Molding	(Th) Injection Molding Analysis	HW#6	12 (11/7, 11/9)	(Tu) Thermoforming	(Th) Fiber, Resin, and Composites		13 (11/14, 11/16)	(Tu) Joining and Assembly	(Th) Design for Assembly		14 (11/21, 11/23)	<b>Thanksgiving Break – No Classes</b>			15 (11/28, 11/30)	<b>Take-home Exam#3</b>			16 (12/7)	<b>Final Exam: Make-up Only</b>		
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