EDMM 5070
Computer Integrated Manufacturing

**Text:**
**Required:**
2. Selected papers from recent publications.

**References:**
2. Robots and Manufacturing Automation by C.Ray Asfahl.
3. An Introduction to Automated Process Planning Systems, by Chang, T.C. and Wysk, R.A.
4. Group Technology, Ham, I., Hitomi, K., and Yoshida, T.

**Schedule**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Reading</th>
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<tr>
<td>1</td>
<td>Introduction to CAD/CAM &amp; CIM in 21st Century Agile Manufacturing, Manufacturing Vision for 2030 NAMII</td>
<td>Preface Paper #1a, b, c Ch#s 1, 2, &amp; 26</td>
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<td>2</td>
<td>Continuous Improvement in Manufacturing Operation Kanban system in CIM – Requirements and Constraints</td>
<td>Quiz #1 (#1a, b, c) Ch 13 &amp; 26, P# 2a, 2b</td>
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<td>3</td>
<td>Mathematical models for Manufg. Lead Time (MLT) WIP determination: JIT, Types of Production Systems</td>
<td>Ch 3 H/W #1 P# 3a &amp; 3b</td>
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<td>4</td>
<td>Emerging Manufacturing Technologies Business Strategies &amp; Time Compression Technologies in CIM</td>
<td>Paper #4a &amp; 4b Quiz2 (Paper #2a, #3a,3b</td>
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<td>5</td>
<td>Additive Manufacturing – Current Challenges &amp; Opps Applications, Implementation Strategies &amp; Dilemma</td>
<td>Quiz #3 (Paper# 4a &amp;4b) Paper (8a)</td>
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<td>6</td>
<td>Group Technology &amp; Cellular Mfg. Virtual Manufacturing</td>
<td>Quiz #4 (#5a, 8a), Paper #5a, 5b, 9b_ H/W #2 Ch 18</td>
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<td>7</td>
<td>Computer Numerical Control - NC/CNC</td>
<td>Ch 7 Quiz #5 (Chapter 7)</td>
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<td>8</td>
<td>Mid Term Exam Computer-Aided Process Planning (CAPP)</td>
<td>Ch. 24</td>
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<td>9</td>
<td>Automatic Identification, Data Capture &amp; RFID</td>
<td>Chapter 12 (Paper #6)</td>
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<td>10</td>
<td>Robotics Manufacturing Automation &amp; WorkCell Design</td>
<td>Chapter 8 Paper #7</td>
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<td>11</td>
<td>Manufacturing Control – Computer Control Open &amp; closed loop control</td>
<td>Ch 4-5 &amp; Notes (Paper #9)</td>
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<td>12</td>
<td>Programmable Logic Controller Semester Project In-Class Presentation I</td>
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<td>13</td>
<td>Integrative Manufacturing Planning and Control(MRP/ERP) Semester Project In-class Presentation II</td>
<td>Ch 9 (Paper #10) Websearch:</td>
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<td>14</td>
<td>ABC Costing and Economic Justification of CIM Semester Project In-class Presentation III</td>
<td>(Paper #11a &amp; 11b Quiz #6 (Paper 11a)</td>
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Possible Topics for Project:

1. Problems related to system integration aspects
2. Capability and functionality analysis of virtual manufacturing tools with possible applications in CIM environment. Implementing Lean and QRM principles in industry.
3. Mathematical and/or simulation modeling for classical problems related CIM environment.
4. Comprehensive literature review for a state-of-the-art in a selected topic of CIM.

NOTE: Please refer to the supplementary sheet for details (available online)

Grading:
- Quizzes: 10%
- Homework & Assignments: 15%
- Mid Term: 20%
- In-class paper presentation: 10%
- Semester project & presentation: 25%
- Final Exam: 20%

Quizzes:
There will be a short quiz (10-15 mins.) for some papers on the date indicated in the schedule.

Homework:
Homework assignments are expected for submission on the dates. Late assignments will NOT be graded.

Class Presentation:
The reading material assigned in the previous class will be summarized by a group of pre-assigned students in 15-20 mins.

Exams:
One midterm and a comprehensive final - closed book and notes. One 8.5” * 11” sheet with formulas and mathematical expressions is allowed.

Grading Scale:
- ≥90 A
- ≥85 BA
- ≥80 B
- ≥75 CB
- ≥70 C
- ≥65 DC
- ≥60 D

Academic Honesty & Integrity – WMU Policy