<table>
<thead>
<tr>
<th>Course Number</th>
<th>CS 401</th>
<th>Course Title</th>
<th>Computer Architecture</th>
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<tbody>
<tr>
<td>Semester Hours</td>
<td>3</td>
<td>Course Coordinator</td>
<td>Koushik Sinha</td>
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**Textbooks**


**References**

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**Course Learning Outcomes**

- To understand the concepts in computer organization and architecture.
- To learn to design processor, control, memory, and I/O sections.
- To learn the basic concept and design of multiprocessor systems.

**Assessment of the Contribution to Student Outcomes**

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<tr>
<th>Outcome</th>
<th>1</th>
<th>2</th>
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<td>Assessed</td>
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**Prerequisites by Topic**

CS 320 with a grade of C or better or graduate standing.
## Major Topics Covered in the Course

1. Evolution and taxonomies of Computer Architecture, review of I/O interface {4 classes}
2. Processor design, microprogramming, instruction formats, number representations, design of advance and high speed arithmetic circuits, addition and subtraction, multiplication, division, pipelined arithmetic {10 classes}
3. Memory organization: semiconductor memories, associative memories, cache memories, parallel memories {4 classes}
4. Pipelines: instruction, arithmetic, static and dynamic pipeline designs, structural, data, and control hazards {12 classes}
5. CISC/RISC features {4 classes}
6. Interconnection networks: non-blocking, blocking, rearrangeable networks {6 classes}
7. Parallel computers: multiprocessors and multicomputers, cache coherence {6 classes}

NOTE: When course is taken as 500-level credit (CS 591 “Special Topics”), there will be additional requirements such as a research project.

Latest Revision: Fall 2020