<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Name</th>
<th>L-T-P Credits</th>
<th>Year of Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS303</td>
<td>SYSTEM SOFTWARE</td>
<td>2-1-0-3</td>
<td>2015</td>
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</tbody>
</table>

**Course Objectives**

To make students understand the design concepts of various system software like Assembler, Linker, Loader and Macro pre-processor, Utility Programs such as Text Editor and Debugger.

**Syllabus**


**Expected Outcome**

Student is able to

1. distinguish different software into different categories.
2. design, analyze and implement one pass, two pass or multi pass assembler.
3. design, analyze and implement loader and linker.
4. design, analyze and implement macro processors.
5. critique the features of modern editing /debugging tools.

For more study materials > www.ktustudents.in
Text book

References

Course Plan
<table>
<thead>
<tr>
<th>Module</th>
<th>Contents</th>
<th>Hours</th>
<th>Sem Exam. Marks</th>
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<tbody>
<tr>
<td>I</td>
<td><strong>Introduction</strong>: System Software Vs. Application Software, Different System Software– Assembler, Linker, Loader, Macro Processor, Text Editor, Debugger, Device Driver, Compiler, Interpreter, Operating System(Basic Concepts only) SIC &amp; SIC/XE Architecture, Addressing modes, SIC &amp; SIC/XE Instruction set, Assembler Directives and Programming.</td>
<td>2</td>
<td>15%</td>
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<td>6</td>
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For more study materials>www.ktustudents.in
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<thead>
<tr>
<th>II</th>
<th><strong>Assemblers</strong></th>
<th><strong>FIRST INTERNAL EXAM</strong></th>
<th></th>
<th>6</th>
<th>15 %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Basic Functions of Assembler. Assembler output format – Header, Text and End Records- Assembler data structures, Two pass assembler algorithm, Hand assembly of SIC/XE program, Machine dependent assembler features.</td>
<td><strong>Assembler design options:</strong></td>
<td></td>
<td>7</td>
<td>15 %</td>
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<tr>
<td></td>
<td>Machine Independent assembler features – program blocks, Control sections, Assembler design options- Algorithm for Single Pass assembler, Multi pass assembler, Implementation example of MASM Assembler</td>
<td><strong>Linker and Loader</strong></td>
<td></td>
<td>7</td>
<td>15 %</td>
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<td></td>
<td>Basic Loader functions - Design of absolute loader, Simple bootstrap Loader, Machine dependent loader features- Relocation, Program Linking, Algorithm and data structures of two pass Linking Loader, Machine dependent loader features, Loader Design Options.</td>
<td><strong>Macro Preprocessor:</strong>-Macro Instruction Definition and Expansion. One pass Macro processor Algorithm and data structures, Machine Independent Macro Processor Features, Macro processor design options</td>
<td></td>
<td>7</td>
<td>20 %</td>
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### VI

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<tr>
<th><strong>Device drivers:</strong></th>
<th>2</th>
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<tbody>
<tr>
<td>Anatomy of a device driver, Character and block device drivers, General design of device drivers</td>
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**Text Editors:**

Overview of Editing, User Interface, Editor Structure.

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<th><strong>Debuggers :-</strong></th>
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<tbody>
<tr>
<td>Debugging Functions and Capabilities, Relationship with other parts of the system, Debugging Methods- By Induction, Deduction and Backtracking.</td>
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| **END SEMESTER EXAM** | |

**Question Paper Pattern**

1. There will be five parts in the question paper – A, B, C, D, E

2. **Part A**
   - Total marks : 12
   - Four questions each having 3 marks, uniformly covering modules I and II; All four questions have to be answered.

3. **Part B**
   - Total marks : 18
   - Three questions each having 9 marks, uniformly covering modules I and II; Two questions have to be answered. Each question can have a maximum of three subparts.

4. **Part C**
   - Total marks : 12
   - Four questions each having 3 marks, uniformly covering modules III and IV; All four questions have to be answered.

5. **Part D**
   - Total marks : 18

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b. *Three* questions each having 9 marks, uniformly covering modules III and IV; *Two* questions have to be answered. Each question can have a maximum of three subparts

6. Part E
   a. Total Marks: 40
   b. *Six* questions each carrying 10 marks, uniformly covering modules V and VI; *four* questions have to be answered.
   c. A question can have a maximum of three sub-parts.

7. There should be at least 60% analytical/numerical questions.