Course Number	CS 320	Course Title	Computer Organization and Architecture
Semester Hours	3	Course Coordinator SP20	Xiaolan Huang
Catalog Description	Overview of the basic logic circuits needed in constructing a computer. Fundamental computer operations: machine and assembly language instructions, stacks, procedures and macros. The translation process: assembly, linking and loading. Hardware elements for processing, transferring, and storing information. Data path and control unit for a simple processor.		

Textbook

SP20

Patterson, D. & Hennessy, J. L. (2017). *Computer Organization And Design RISC-V Edition: The Hardware Software Interface.* Morgan Kaufmann Publications, ISBN: 978-0128122754.

References

Course Learning Outcomes

- To learn the basic concepts and elements of computer systems.
- To understand machine and assembly language programming.
- To extend this knowledge to the translation process and the systems programs that is part of the hardware/software interface.
- To learn the basic hardware for processing, storing, and moving information, and how they are organized within the internal architecture of a computer.
- To learn how to design a simple processor.

Assessment of the Contribution to Student Outcomes

SP 20

Outcome →	1	2	3	4	5	6
Assessed →	X	X			X	

Prerequisites by Topic

CS 220 with grade of *C* or better.

Major Topics Covered in the Course

1. Overview of basic logic circuits {4 classes}
2. Computer operations: machine and assembly language instructions, stacks, procedures, macros {9 classes}
3. Assembly language programming {6 classes}
4. Translation: assemblers, linkers, loaders, stack management, recursion {8 classes}
5. Hardware elements for processing, transferring, and storing flip-flops, triggering of flip-flops, sequential and finite state machines, state assignment problems, design procedure, analysis procedure, races {6 classes}
6. Hardware Design and Control
7. Data path, control units, and design of a simple processor {4 classes}