

**University of Texas at El Paso
Course Syllabus**

COURESE DESCRIPTION

Dept., Number	CS3432	Course Title	Computer Architecture I: Basic Computer Organization and Design
Approval Date	Sept 2018	Course Coordinator	Eric Freudenthal

CATALOG DESCRIPTION

Compile and assembly processes; machine organization; fetch/ decode/execute process; symbolic coding of instructions and data, including instruction types, formats, and addressing modes; implementation of data and control structures, subroutines, and linkage; and input/output handling at the assembly level, including memory-mapped I/O and interrupt and exception handling.

TEXT BOOK

Kerningham, Brian W & Ritchie, Dennis M. "The C Programming Language, Second edition," Prentice Hall, ISBN: 0-13-115817-1.

COURSE OUTCOMES

family	0 prereq	1 familiar	2 apply	3 synthesize
Numeric representations & ops	A. familiar with radixes, signed representations & scientific notation		B. convert hex, dec, s-dec, binary C. binary metric D. s/u comparison (flags, order) E. Add-with-carry F. cast/sign-extend G. floating point	H. optimize
Linearization	A. algebra, imperative elements		B. expressions (incl side effects) C. control flow (if/while/for) D. translate boolean logic E. branch tables F. op on arrays, structs, and pointers	G. optimize
Gross architecture			A. appropriate instructions B. instruction encoding C. instruction decoding D. addressing mode E. interrupt mechanism F. interrupt handling	G. optimize
Timing	A. algebra, synchronous logic		B. cycles/instruction C. determine which instructions repeat in a loop D. time to execute a simple program	
Subroutine linkage & separate compilation	A. Some OO language		B. parameter passing C. return value D. allocation of auto vars E. register usage	G. optimize

			F. global/local symbols	
Variable allocation	A. Some OO language		B. scope C. size D. alignment E. arrays F. pointers G. structs H. static/auto (choice)	
Tools	A. ide B. Hierarchical filesystem		C. editor D. compiler E. make F. svn G. bash H. gdb	
Written communication	A. proficient in english		B. interpret technical documentation on familiar topics C. describe implementations that they design	D. convey nuances & theory of operation
Mature programming	A. proficient in OO programming B. appropriate comments C. can modularize D. appropriate symbol names E. coding style		F. appropriate comments G. modularize H. imperative programming I. appropriate symbol names J. coding style	
Advanced topics		A. pipelining B. predicated instructions		
Devices		A. memory & storage devices	B. programmed i/o C. interrupt from devices	

ABET STUDENT OUTCOMES MAPPING

Course outcomes	Student outcome
N2b-g, N3h	1
L2b-f, L3g, S2b-f, S3g, M2f-j, D2b,	2 (ABET 1)
L2b-f, L3g, S2b-f, S3g, M2f-j, D2b	3 (ABET 2)
W2b-c	6 (ABET 3)
O2c-h	9
L2b, L2c, L2e, L2f	10 (ABET 6)

PREREQUISITES BY TOPIC

(CS 2302 w/C or better AND EE 2169 w/C or better AND EE 2369 w/C or better AND MATH 2300 w/C or better) OR (CS 2401 w/B or better AND EE 2169 w/B or better AND EE 2369 w/B or better AND MATH 2300 w/B or better)