

SOFTWARE ENGINEERING, B.A.T.

The **Bachelor of Applied Technology in Software Engineering** is designed for students who complete the Associate of Applied Science in Computer Science degree and want to learn advanced skills in software engineering.

Software engineers hold key positions in many industries – including medical, industrial, military, communications, aerospace, business, scientific and general computing. While in the BAT program, you will develop highly sought after research, design, development and testing skills that will help keep many critical systems operating accurately and efficiently. Students will also have the opportunity to develop strong problem-solving and communication skills, along with the development of teamwork skills, while being exposed to state-of-the-art technologies for developing mobile applications, web applications and software for embedded systems.

WVUP offers students the opportunity to gain work experience while completing their associate in Computer Information Technology through a state-funded program called Learn and Earn. The Learn and Earn program creates partnerships between industry and community and technical colleges by allowing students hands-on learning experience, and employers to train ideal future employees. A few examples of local businesses partnered with WVUP for the learn and earn in computer science are iTech, Ntiva and Westbrook Health Services.

For more information on all Learn and Earn programs, click here (<https://www.wvup.edu/learn-and-earn/>).

Milestone Course

These courses are the keys to graduation. Courses should be taken in the recommended semesters to stay on time for completion.

Career Planning

- Software Engineer
- DevOps Engineer
- Systems Analyst
- Senior Application Developer
- Applications Architect

Capstone Course

A semester long project that must be taken in the graduation semester. A “C” or better must be earned. Software Development Fundamentals Certification.

Students should average 15 credit hours per semester, or 30 per year, to graduate on time.

Total Degree Credits: 120

Course	Title	Hours
Semester 1		
COLL 101	ORIENTATION TO COLLEGE ⁰	0
CS 121	INTRODUCTION TO PROGRAMMING ¹	4
CIT 114	WINDOWS OPERATING SYSTEMS	3
Quantitative Reasoning Elective		3
MATH 125 or MATH 126 or MATH 128 or MATH 141 or MATH 150 or MATH 155 or MATH 156	TECHNICAL MATHEMATICS or ~COLLEGE ALGEBRA or ~COLLEGE TRIGONOMETRY or ~FINITE MATH or INTRODUCTION TO CALCULUS or ~CALCULUS 1 or ~CALCULUS 2	
Writing and Rhetoric (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#wr) Elective (ENGL 101 Preferred)		3
Hours		13
Semester 2		
CS 122	OBJECT ORIENTED PROGRAMMING	4
CIT 130	PRIN OF INFORMATION SYSTEMS	3
CS 129	INTRO TO WEB PAGE DESIGN	3
CS 201	DATABASE THEORY AND DESIGN	3
Free Elective		3
Hours		16
Semester 3		
CS 220	WEB APPLICATION DEVELOPMENT	3
CIT 105	INTRODUCTION TO NETWORKS ²	5

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Scientific Inquiry (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#si) Elective (PHYS 101 is preferred)	4
Select one of the following:	3
Aesthetics, Creativity, and Appreciation (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#aca)	
Human Communication and Interaction (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#hci)	
People and Their Worlds (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#ptw) (Preferred)	
Hours	15
Semester 4	
Select one of the following:	3
Aesthetics, Creativity, and Appreciation (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#aca)	
Human Communication and Interaction (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#hci) (Preferred)	
People and Their Worlds (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#ptw)	
CS 221 DATA STRUCTURES ¹	4
CIT 240 INTRODUCTION TO LINUX ^{1,3}	3
SEC 101 SECURITY FUNDAMENTALS ⁴	3
CIT 260 CAPSTONE PROJECT ⁴	3
Hours	16
Semester 5	
SEC 300 INTRO TO SECURITY	3
STEM 300 ETHICS AND TECHNOLOGY	3
CS 302 SYSTEM ANALYSIS AND DESIGN	3
Select one of the following:	3
Aesthetics, Creativity, and Appreciation (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#aca)	
Human Communication and Interaction (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#hci)	
People and Their Worlds (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#ptw)	
Upper Level Elective	2
Hours	14
Semester 6	
MATH 318 DISCRETE MATHEMATICS	3
CS 320 OBJECT ORIENTED DESIGN	3
CS 410 SOFTWARE MAINT & EVOLUTION	3
or CS 420 or ADVANCED WEB DEVELOPMENT	
CS 309 OPERATING SYSTEMS	3
or CS 321 or MOBILE APPLICATION DEVELOPMENT	
Writing and Rhetoric (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#wr) Elective: (ENGL 102 is preferred)	3
Hours	15
Semester 7	
STEM 420 PROJECT MANAGEMENT ¹	3
CS 403 SOFTWARE ENGR & DATA STRUCTURE	3
MATH 211 ~STATISTICS	3
Select two of the following:	6
Aesthetics, Creativity, and Appreciation (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#aca)	
Human Communication and Interaction (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#hci)	
People and Their Worlds (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#ptw)	
Hours	15
Semester 8	
CS 460 SENIOR PROJECT ⁴	3
CS 420 ADVANCED WEB DEVELOPMENT	3
or CS 410 or SOFTWARE MAINT & EVOLUTION	
Scientific Inquiry (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#si) Elective (PHYS 102 is preferred)	4
Upper Level Technical Elective	3
CS 321 MOBILE APPLICATION DEVELOPMENT	3
or CS 309 or OPERATING SYSTEMS	
Hours	16
Total Hours	120

⁰ Institutional Graduation Requirement, but does not count in degree total.

¹ Milestone Course

² CISCO 1

³ LINUX Cert.

⁴ Capstone Course

Degree requires a total of 120 credit hours. [Core Course Credit Hours : 35]

Code	Title	Hours
Core Courses		
COLL 101	ORIENTATION TO COLLEGE ¹	0
	Writing and Rhetoric (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#wr)	6
	Quantitative Reasoning (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#qr)	6
	Scientific Inquiry (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#si)	8
	Aesthetics, Creativity, and Appreciation (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#aca)	6
	Human Communication and Interaction (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#hci)	3
	People and Their Worlds (https://wvup-public.courseleaf.com/programs-study/general-education-mission/#ptw)	6
Program Courses		
SEC 300	INTRO TO SECURITY	3
STEM 300	ETHICS AND TECHNOLOGY	3
CS 302	SYSTEM ANALYSIS AND DESIGN	3
CS 309	OPERATING SYSTEMS	3
CS 321	MOBILE APPLICATION DEVELOPMENT	3
CS 410	SOFTWARE MAINT & EVOLUTION	3
CS 420	ADVANCED WEB DEVELOPMENT	3
MATH 318	DISCRETE MATHEMATICS	3
CS 320	OBJECT ORIENTED DESIGN	3
STEM 420	PROJECT MANAGEMENT	3
CS 403	SOFTWARE ENGR & DATA STRUCTURE	3
CS 460	SENIOR PROJECT	3
	Upper Level Technical Electives ²	5
	Complete CS AAS Degree ³	44
Total Hours		120

¹ Institutional Graduation Requirement, but does not count toward degree total.

² Any 300 or 400 level CS, CIT, SEC, STEM, MATH course.

³ Completing the CS AAS Degree or an equivalent is a program requirement for admission.