

# COMPUTER SCIENCE MAJOR, B.S.

## MAJOR CORE REQUIREMENTS

Course	Title	Credits
<b>General Requirements</b>		
General Education ( <a href="http://catalog.uwplatt.edu/undergraduate/degree-requirements/bachelor-of-science-degree-core-curriculum/">http://catalog.uwplatt.edu/undergraduate/degree-requirements/bachelor-of-science-degree-core-curriculum/</a> )		40-53
<b>Core Requirements (16 credits):</b> <sup>1</sup>		
COMPUTER 1010	Introduction to Computer Science	1
COMPUTER 1430	Introduction to Computer Programming	3
COMPUTER 2430	Object-Oriented Programming	3
COMPUTER 2630	Data Structures	3
COMPUTER 4330	Computer Science Project I	3
COMPUTER 4730	Computer Science Project II	3
Select an emphasis, a CS+X program, or complete the non-emphasis requirements below:		45-46
<b>Non-Emphasis Requirements (39 credits):</b> <sup>1</sup>		
COMPUTER 3010	Algorithms	3
COMPUTER 3230	Operating Systems	3
SOFTWARE 2730	Introduction to Software Engineering	3
SOFTWARE 3430	Object Oriented Analysis and Design	3
COMPUTER 3520	Programming Language Structures	3
COMPUTER 3630	Database Design and Implementation	3
COMPUTER 3830	Data Communications and Computer Networks	3
CYB 3840	Introduction to Cybersecurity	3
MATH 2640	Calculus and Analytic Geometry I	4
MATH 2730	Discrete Mathematics	3
COMPENG 2780	Logic and Digital Design	4
COMPENG 3780	Computer Architecture	4
<b>Electives</b> <sup>1</sup>		
Select 6 credits of the following:		6
COMPUTER 3000+	COMPUTER 3000-level and up <sup>2</sup>	
SOFTWARE 3330	Intermediate Software Engineering	
COMPUTER 3030	Artificial Intelligence	
SOFTWARE 3730	Software Quality	
CYB 3850	Cryptography	
CYB 3910	Introduction to Network Security	
COMPUTER 3920	Computer Graphics	
CYB 3930	IT Security Management	
CYB 3960	Software Security	
COMPUTER 4030	Machine Learning	
SOFTWARE 4130	Real-Time Embedded Systems Programming	

<sup>1</sup> A grade of C- or better is required in all COMPUTER, SOFTWARE, and CYBERSECURITY courses.

<sup>2</sup> COMPUTER 4830, COMPUTER 4930 and COMPUTER 4990 can be counted only with the consent of the department.

## CS+X PROGRAMS

Interdisciplinary CS+X programs allow students to learn computing skills along with the knowledge of an application discipline:

- CS + Business (p. 2)
- CS + Chemistry (p. 2)
- CS + Computational Biology (p. 3)
- CS + Digital Humanities (p. 4)
- CS + History (p. 5)

- CS + Philosophy (p. 6)
- CS + Psychology (p. 7)
- CS + Supply Chain Management (p. 8)

## CS + BUSINESS

The Business emphasis allows students to acquire technical computing skills including programming, software development, algorithm analysis, and network design while also acquiring a strong grounding in business management, accounting, and economics. This enriched education prepares students for a variety of computing jobs in the business world.

### BUSINESS EMPHASIS<sup>1,2</sup>

Course	Title	Credits
<b>Computer Science Requirements</b>		
COMPUTER 3630	Database Design and Implementation	3
SOFTWARE 2730	Introduction to Software Engineering	3
<b>Math Requirements</b>		
MATH 2130	Discrete Structures	3
<b>Business Requirements</b>		
BUSADMIN 1300	Global Business	3
BUSADMIN 2100	Supply Chain Management	3
BUSADMIN 2330	Leadership and Management	3
BUSADMIN 2630	Introduction to Marketing	3
BUSADMIN 3030	Human Resource Management	3
ACCTING 2010	Financial Accounting	3
ECONOMIC 2230	Principles of Microeconomics	3
<b>Computer Science Electives</b>		
Select 6 credits from the following:		6
COMPUTER 3010	Algorithms	
COMPUTER 3030	Artificial Intelligence	
COMPUTER 3230	Operating Systems	
SOFTWARE 3330	Intermediate Software Engineering	
COMPUTER 3520	Programming Language Structures	
SOFTWARE 3730	Software Quality	
COMPUTER 3830	Data Communications and Computer Networks	
CYB 3840	Introduction to Cybersecurity	
COMPUTER 3920	Computer Graphics	
COMPUTER 4030	Machine Learning	
<b>Business Electives</b>		
Select 9 credits from the following:		9
BUSADMIN 3240	E-Commerce and E-Marketing in Today's World	
BUSADMIN 3530	Organizational Behavior	
BUSADMIN 3620	Corporate Finance	
BUSADMIN 4140	International Management	
BUSADMIN 4170	Predictive Analytics	
<b>Total Credits</b>		<b>45</b>

<sup>1</sup> A grade of C- or better must be obtained in all COMPUTER and SOFTWARE courses.

<sup>2</sup> Students pursuing this emphasis may not pursue a Business Administration minor.

## CS + CHEMISTRY

Chemistry is the study of matter and the chemical reactions between substances. Computers are becoming an increasingly important tools for solving a variety of chemical problems. Computer simulations are used by chemists to help understand the nature of matter and chemical reactions. Computers are used to calculate the structures and properties of atoms and molecules. Computers have also been used to predict hitherto

unobserved chemical phenomena. Our unique interdisciplinary program allows students to combine their passions for chemistry and computing. Student get to pursue their love of chemistry while also acquiring job-ready skills that employers are looking for.

## CHEMISTRY EMPHASIS<sup>1,2</sup>

Course	Title	Credits
<b>Computer Science Required Courses</b>		
COMPUTER 2630	Data Structures	3
COMPUTER 3030	Artificial Intelligence	3
COMPUTER 4030	Machine Learning	3
<b>Chemistry Required Courses</b>		
CHEMSTRY 1140	General Chemistry I	4
CHEMSTRY 1240	General Chemistry II	4
CHEMSTRY 3510	Organic Chemistry I Lab	1
CHEMSTRY 3540	Organic Chemistry I	4
CHEMSTRY 4110	Physical Chemistry Lab I	1
CHEMSTRY 4130	Physical Chemistry I	4
<b>Math Required Courses</b>		
MATH 1830	Elementary Statistics	3
MATH 2130	Discrete Structures	3
<b>Computer Science Electives</b>		
Select 3 credits from the following		
COMPUTER 3010	Algorithms	3
COMPUTER 3520	Programming Language Structures	3
COMPUTER 3630	Database Design and Implementation	3
COMPUTER 3830	Data Communications and Computer Networks	3
SOFTWARE 2730	Introduction to Software Engineering	3
<b>Chemistry Electives</b>		
Select 13 credits from the following		
CHEMSTRY 2150	Quantitative Analysis	4
CHEMSTRY 2730	Inorganic Chemistry	4
CHEMSTRY 3610	Organic Chemistry II Lab	1
CHEMSTRY 3630	Organic Chemistry II	3
CHEMSTRY 4210	Physical Chemistry Lab II	1
CHEMSTRY 4230	Physical Chemistry II	3
CHEMSTRY 4610	General Biochemistry Lab	1
CHEMSTRY 4630	General Biochemistry	3

<sup>1</sup> Students must have a C- or better in all SOFTWARE, COMPUTER, and CYBERSECURITY courses.

<sup>2</sup> Students pursuing this emphasis may not pursue a Chemistry minor.

<sup>3</sup> Students must have a C- or better in MATH 1830 and MATH 2130.

## CS + COMPUTATIONAL BIOLOGY

Computational biology refers to biological research in which computing plays a central role. Computer-based models, simulations, and statistical analyses are used to investigate all areas of biological discovery. Bioinformatic analyses – including sequence alignment and phylogenetic tree inference – are the most recognizable forms of computational biology. However, a task as distinct as modeling and simulating the fluid dynamics of a closed circulatory system is also an example of computational biology. The breadth of the field suggests that students should be allowed some freedom to choose upper division courses relevant to their interests.

## COMPUTATIONAL BIOLOGY EMPHASIS<sup>1,2</sup>

Course	Title	Credits
<b>Computer Science Requirements</b>		
COMPUTER 3030	Artificial Intelligence	3
COMPUTER 4030	Machine Learning	3
<b>Math Requirements<sup>3</sup></b>		

MATH 1830	Elementary Statistics	3
MATH 2130	Discrete Structures	3
<b>Biology Requirements</b>		
BIOLOGY 1650	The Unity of Life	5
BIOLOGY 1750	The Diversity of Life	5
BIOLOGY 2420	Fundamentals of Biological Investigations	3
BIOLOGY 3330	Genetics	3
BIOLOGY 3450	Ecology and Evolution	3
BIOLOGY 3470	Systematics and Evolutionary Analysis	3
<b>Computer Science Electives</b>		
Select 3 credits from the following:		3
COMPUTER 3010	Algorithms	
COMPUTER 3230	Operating Systems	
COMPUTER 3520	Programming Language Structures	
COMPUTER 3630	Database Design and Implementation	
COMPUTER 3830	Data Communications and Computer Networks	
CYB 3840	Introduction to Cybersecurity	
COMPUTER 3920	Computer Graphics	
<b>Biology Electives</b>		
Select 8 credits from the following:		8
8 additional credits of any Biology course at 3000+ level		
<b>Total Credits</b>		<b>45</b>

<sup>1</sup> Students must have a C- or better in all SOFTWARE, COMPUTER, and CYBERSECURITY courses.

<sup>2</sup> Students pursuing this emphasis may not pursue a Biology minor.

<sup>3</sup> Students must have a C- or better in MATH 1830 and MATH 2130.

## CS + DIGITAL HUMANITIES

Digital humanities application of computing technologies to advance the study of humanities. If you are equally enthusiastic about computing and humanities this program provides a way for you to combine both of your passions allowing you to study what you love while also learning job-ready skills that employers are looking for.

### DIGITAL HUMANITIES EMPHASIS <sup>1,2</sup>

Course	Title	Credits
<b>Computer Science Requirements</b>		
COMPUTER 1010	Introduction to Computer Science	1
COMPUTER 1430	Introduction to Computer Programming	3
COMPUTER 2430	Object-Oriented Programming	3
COMPUTER 2630	Data Structures	3
COMPUTER 3010	Algorithms	3
COMPUTER 3030	Artificial Intelligence	3
COMPUTER 4030	Machine Learning	3
COMPUTER 4330	Computer Science Project I	3
COMPUTER 4730	Computer Science Project II	3
<b>Humanities Requirements</b>		
ENGLISH 1230	College Writing II	3
ENGLISH 2120	Introduction to Creative Writing	3
ENGLISH 2250	Introduction to Film	3
ENGLISH 3000	Technical Writing	3
MEDIA 1630	Introduction to Mass Media	3
PHLSPHY 3540	Science, Technology, and Ethics	3
SOCIOLOGY 1030	Introduction to Sociology	3
SOCIOLOGY 3440	Social Research Methods	3

Mathematics Requirements <sup>3</sup>		
MATH 1830	Elementary Statistics	3
MATH 2130	Discrete Structures	3
Humanities Electives		
Select 2 courses (6 credits) from:		6
ENGLISH 2210	Introduction to Linguistics	
ENGLISH 2480	Race and Ethnicity in Film	
ENGLISH 2490	Gender in Film	
ENGLISH 2770	International Cinema	
ENGLISH 3090	Designing for Usability	
ENGLISH 3160	Creative Nonfiction Writing	
ENGLISH 3250	Sociolinguistics	
ENGLISH 3260	Language and Culture	
ENGLISH 3360	Writing, Editing, and Publishing in Multiple Media	
Computer Science Electives		
Select 1 course (3 credits) from the following		3
COMPUTER 3520	Programming Language Structures	
COMPUTER 3630	Database Design and Implementation	
COMPUTER 3830	Data Communications and Computer Networks	
SOFTWARE 2730	Introduction to Software Engineering	

<sup>1</sup> Students must have a C- or better in all SOFTWARE, COMPUTER, and CYBERSECURITY courses.

<sup>2</sup> Students pursuing this emphasis may not pursue an English minor.

<sup>3</sup> Students must have a C- or better in MATH 1830 and MATH 2130.

## CS + HISTORY

History is the study of change over time. There are few technologies that have had as large of an impact on human history as computing technology. If you are equally enthusiastic about computing and history this program provides a way for you to combine both of your passions allowing you to study what you love while also acquiring job-ready skills that employers are looking for.

## HISTORY EMPHASIS <sup>1,2</sup>

Course	Title	Credits
Computer Science Requirements		
COMPUTER 3030	Artificial Intelligence	3
COMPUTER 4030	Machine Learning	3
Math Requirements		
MATH 1830	Elementary Statistics	3
MATH 2130	Discrete Structures	3
Computer Science Electives		
Select 3 credits from the following		3
COMPUTER 3010	Algorithms	
COMPUTER 3230	Operating Systems	
COMPUTER 3520	Programming Language Structures	
COMPUTER 3630	Database Design and Implementation	
COMPUTER 3830	Data Communications and Computer Networks	
History Requirements		
HISTORY 2010	World Civilization I	3
HISTORY 2020	World Civilization II	3
HISTORY 2330	History of the United States to 1877	3
HISTORY 2430	History of the United States since 1877	3
HISTORY 4900	Historiography and Research Methods	3
History Electives		
One 3000+ HISTORY course in US History (3 cr)		9

One 3000+ HISTORY course in European History (3 cr)

One 3000+ HISTORY course in Non-Western History (3 cr)

Additional Electives		6
ENGLISH 3000	Technical Writing	
GEOGRPHY 3230	Geographic Information Systems	
HISTORY 2500	An International History of Technology	
HISTORY 4660	Cooperative Field Experience	
PHLSPHY 3540	Science, Technology, and Ethics	
POLISCI 3440	Social Research Methods	
<b>Total Credits</b>		<b>48</b>

<sup>1</sup> Students must have a C- or better in all SOFTWARE, COMPUTER, and CYBERSECURITY courses.

<sup>2</sup> Students pursuing this emphasis may not pursue a History minor.

<sup>3</sup> Students must have a C- or better in MATH 1830 and MATH 2130.

## CS + PHILOSOPHY

Philosophy is the study of the nature of reality. Just as past technological revolutions have provided new perspectives on the nature of reality, the computing revolution is providing fascinating new ways of understanding the nature of our universe and humanity's place in it. If you are equally enthusiastic about computing and philosophy this program provides a way for you to combine both of your passions allowing you to study what you love while also learning job-ready skills that employers are looking for.

### PHILOSOPHY EMPHASIS <sup>1,2</sup>

Course	Title	Credits
<b>Computer Science Requirements</b>		
COMPUTER 3030	Artificial Intelligence	3
COMPUTER 4030	Machine Learning	3
<b>Math Requirements <sup>3</sup></b>		
MATH 1830	Elementary Statistics	3
MATH 2130	Discrete Structures	3
<b>Computer Science Electives</b>		
Select 3 credits from the following		
COMPUTER 3010	Algorithms	3
COMPUTER 3230	Operating Systems	3
COMPUTER 3520	Programming Language Structures	3
COMPUTER 3630	Database Design and Implementation	3
COMPUTER 3830	Data Communications and Computer Networks	3
<b>Philosophy Requirements</b>		
PHLSPHY 1130	Introduction to Philosophy	3
PHLSPHY 2530	Ethics	3
PHLSPHY 2630	Logic	3
PHLSPHY 3030	Ancient and Medieval Philosophy	3
PHLSPHY 3040	Modern Philosophy	3
PHLSPHY 3540	Science, Technology, and Ethics	3
<b>Philosophy Electives</b>		
Select 12 credits from the following		
PHLSPHY 2100	Thinking Critically	3
PHLSPHY 3140	Philosophy of Sport	3
PHLSPHY 3530	Philosophy of Gender and Sexuality	3
PHLSPHY 3230	Philosophy of Religion	3
PHLSPHY 3630	Philosophy of Law	3
PHLSPHY 3840	Existentialism	3

<sup>1</sup> Students must have a C- or better in all SOFTWARE, COMPUTER, and CYBERSECURITY courses.

<sup>2</sup> Students pursuing this emphasis may not pursue a Philosophy minor.

<sup>3</sup> Students must have a C- or better in MATH 1830 and MATH 2130.

## CS + PSYCHOLOGY

Psychology is the study of mind and behavior. Computers have become an essential tool for psychological investigations. Not only are they useful for analyzing experimental data but computers have come to be seen as metaphors for the mind itself. Thus cognitive psychologists aim to build computer models of human cognitive processes. If you are passionate about psychology and computer science, this unique interdisciplinary program is for you! It will allow you to pursue your love of psychology while also allowing you to learn computer programming skills in demand in the world of work.

## PSYCHOLOGY EMPHASIS <sup>1,2</sup>

Course	Title	Credits
<b>Computer Science Requirements</b>		
COMPUTER 3030	Artificial Intelligence	3
COMPUTER 4030	Machine Learning	3
<b>Math Requirements <sup>3</sup></b>		
MATH 1830	Elementary Statistics	3
MATH 2130	Discrete Structures	3
<b>Psychology Required Courses</b>		
PSYCHLGY 1130	General Psychology	3
PSYCHLGY 2080	Psychology of Women and Gender	3
PSYCHLGY 2230	Introduction to Experimental Psychology	3
PSYCHLGY 3000	Cognitive Psychology	3
PSYCHLGY 3430	Physiological Psychology	3
<b>Computer Science Electives</b>		
Select 3 credits from the following:		3
COMPUTER 3010	Algorithms	
COMPUTER 3520	Programming Language Structures	
COMPUTER 3630	Database Design and Implementation	
COMPUTER 3830	Data Communications and Computer Networks	
CYB 3840	Introduction to Cybersecurity	
SOFTWARE 2730	Introduction to Software Engineering	
<b>Psychology-Clinical Electives</b>		
Select 3 credits from the following:		3
PSYCHLGY 4010	Health Psychology	
PSYCHLGY 4430	Psychopathology	
PSYCHLGY 4840	Substance Abuse I: Theory and Assessment	
PSYCHLGY 4930	Techniques of Counseling	
<b>Psychology Non-Clinical Electives</b>		
Select 12 credits from the following:		12
PSYCHLGY 2030	Positive Psychology	
PSYCHLGY 2930	Human Behavior in the Social Environment	
PSYCHLGY 3030	Learning and Behavior	
PSYCHLGY 3130	Child Psychology	
PSYCHLGY 3230	Adolescent Psychology	
PSYCHLGY 3530	Social Psychology	
PSYCHLGY 3630	The Psychology of Human Sexuality	
PSYCHLGY 3990	Psychology of Adulthood and Aging	
PSYCHLGY 4020	Contemporary Issues in Psychology	
PSYCHLGY 4730	Individual Study in Psychology	
PSYCHLGY 4830	Psychology and the Law	

**Total Credits** 45

<sup>1</sup> Students must have a C- or better in all SOFTWARE, COMPUTER, and CYBERSECURITY courses.

<sup>2</sup> Students pursuing this emphasis may not pursue a Psychology minor.

<sup>3</sup> Students must have a C- or better in MATH 1830 and MATH 2130.

## CS + SUPPLY CHAIN MANAGEMENT

Our unique program allows students to learn how to optimize supply chain operations, processes, and information flows using computing tools and technologies. Students learn how to use computing to optimize activities and costs to serve customers efficiently and achieve a sustainable competitive advantage. Such skills are in high demand in both the domestic as well as the global economy.

### SUPPLY CHAIN MANAGEMENT EMPHASIS <sup>1,2</sup>

Course	Title	Credits
<b>Computer Science Requirements</b>		
COMPUTER 3630	Database Design and Implementation	3
SOFTWARE 2730	Introduction to Software Engineering	3
<b>Math Requirements</b>		<b>3</b>
MATH 2130	Discrete Structures	3
<b>Computer Science Electives</b>		
Select 6 credits from the following:		6
COMPUTER 3010	Algorithms	
COMPUTER 3030	Artificial Intelligence	
COMPUTER 3230	Operating Systems	
COMPUTER 3520	Programming Language Structures	
COMPUTER 3830	Data Communications and Computer Networks	
CYB 3840	Introduction to Cybersecurity	
COMPUTER 3920	Computer Graphics	
COMPUTER 4030	Machine Learning	
<b>Supply Chain Management Requirements</b>		
BUSADMIN 1210	Introduction to ERP	1
BUSADMIN 1300	Global Business	3
BUSADMIN 2100	Supply Chain Management	3
BUSADMIN 2010	Business Communication	3
BUSADMIN 2330	Leadership and Management	3
BUSADMIN 3540	Quality Management	3
BUSADMIN 4120	Operations Management	3
BUSADMIN 4170	Predictive Analytics	3
BUSADMIN 4220	Data Driven Decisions & IOT	3
ACCTING 2010	Financial Accounting	3
<b>Supply Chain Management Electives</b>		
Select 3 credits from the following:		3
BUSADMIN 4160	Purchasing Management	
BUSADMIN 4180	Transportation Management	
<b>Total Credits</b>		<b>49</b>

<sup>1</sup> A grade of C- or better must be obtained in all COMPUTER and SOFTWARE courses.

<sup>2</sup> Students pursuing this emphasis may not pursue a Supply Chain Management minor.

<sup>3</sup> Students must have a C- or better in MATH 2130.