



## CURRICULUM

### Bachelor of Science in Computer Science (BSCS)

Academic Year 2018-2019

Reference CMOs: CMO No. 25, s. 2015, CMO 4 s. 2018, CMO No 20, s. 2013,  
 PICAB Criteria for Accrediting ITE Programs and ABET CAC Criteria for Accrediting Computing Programs

#### Curriculum Description

The curriculum for BSCS includes the required GE courses, six (6) core courses common to all ITE programs, professional courses required for the BSCS program, and electives. The students are also required to undertake practicum work and complete a thesis.

The foundation and professional courses under the BSCS program cover theory, algorithms, software design and development, and new developments in computing.

#### Program Objectives

The alumni of BS Computer Science program, about three to five years after graduation shall:

1. Help create innovations to ensure the competitive edge of the Philippine computing industry.
2. Adhere to ethical standards in the practice of the computing profession.

#### Program Outcomes

1. Ability to analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Ability to design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Ability to communicate effectively in a variety of professional contexts.
4. Ability to recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Ability to function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Ability to apply computer science theory and software development fundamentals to produce computing-based solutions.

#### Curriculum Components

	Courses	Units	Total
	<b>A. General Education Courses (CMO No. 20, s 2013 &amp; CMO No. 4, s 2018)</b>		<b>36 units</b>
	<b>B. Common Courses</b>		<b>18 units</b>
	Introduction to Computing	3	
	Computer Programming	3	
	Advanced Computer Programming	3	
	Data Structures and Algorithms	3	
	Information Management	3	
	Application Development and Emerging Technologies	3	
	<b>C. Professional Courses</b>		<b>75 units</b>
	Mobile Computing	3	
	Web Systems and Technologies	3	
	Object-Oriented Programming	3	
	Design and Analysis of Algorithms	3	
	Automata Theory and Formal Languages	3	
	Computer Organization w/ Assembly Language	3	
	Information Assurance and Security	3	
	Human Computer Interaction	3	
	Computer Networking	3	

	Principles of Operating Systems	3	
	Programming Languages	3	
	CS Internship	3	
	Software Engineering	3	
	Advanced Software Engineering	3	
	Social Issues and Professional Practice	3	
	CS Thesis 1	3	
	CS Thesis 2	3	
	Advanced Object-Oriented Programming	3	
	Database Management Systems	3	
	Computer Architecture	3	
	Fundamentals of Data Science	3	
	Modeling and Simulation	3	
	Artificial Intelligence	3	
	Machine Learning	3	
	Technopreneurship	3	
	<b>D. CS Professional Electives (Choice of 3 courses)</b>		<b>9 units</b>
	Computational Science	3	
	Graphics and Visual Computing	3	
	Parallel and Distributed Computing	3	
	Systems Fundamentals	3	
	Computer Networking 2	3	
	Computer Networking 3	3	
	Internet-of-Things (IoT)	3	
	Cloud Computing	3	
	Cybersecurity	3	
	Software Quality Assurance	3	
	<b>E. Additional Math and Science Requirements (PICAB &amp; ABET Criteria)</b>		<b>30 units</b>
	Linear Algebra	3	
	Discrete Mathematics	3	
	Differential Calculus	3	
	Integral Calculus	3	
	Data Analysis	3	
	Number Theory	3	
	Numerical Methods	3	
	Symbolic Logic	3	
	Calculus-Based Physics	3	
	Environmental Sciences	3	
	<b>F. Mandated Courses</b>		<b>14 units</b>
	Physical Education 1-4	8	
	NSTP 1 and 2	6	

<b>SUMMARY</b>	
<b>Courses</b>	<b>Number of Units</b>
General Education	36
Common Courses	18
Professional Courses	75
Professional Electives	9
Additional Math and Science Requirements	30
Mandated Courses	14
<b>TOTAL</b>	<b>182</b>

**PROGRAM OF STUDY**

<b>FIRST YEAR</b>					
<b>FIRST SEMESTER</b>					
<b>Code</b>	<b>Course Title</b>	<b>Units</b>	<b>Lec</b>	<b>Lab</b>	<b>Prerequisite</b>
IT 111	Introduction to Computing	3	2	3	-
CS 111	Computer Programming	3	2	3	-
Fili 101	Kontekstwalisadong Komunikasyon sa Filipino	3	3	-	-
GEd 101	Understanding the Self	3	3	-	-
GEd 102	Mathematics in the Modern World	3	3	-	-
Math 111	Linear Algebra	3	3	-	-
PE 101	Physical Fitness, Gymnastics and Aerobics	2	2	-	-
NSTP 111	National Service Training Program 1	3	3	-	-
<b>TOTAL</b>		<b>23</b>	<b>21</b>	<b>6</b>	

<b>FIRST YEAR</b>					
<b>SECOND SEMESTER</b>					
<b>Code</b>	<b>Course Title</b>	<b>Units</b>	<b>Lec</b>	<b>Lab</b>	<b>Prerequisite</b>
CS 121	Advanced Computer Programming	3	2	3	CS 111
Fili 102	Filipino sa Iba't Ibang Disiplina	3	3	-	-
GEd 105	Readings in Philippine History	3	3	-	-
GEd 108	Art Appreciation	3	3	-	-
Math 401	Differential Calculus	3	3	-	Math 111
Math 407	Number Theory	3	3	-	GEd 102
PE 102	Rhythmic Activities	2	2	-	PE 101
NSTP 121	National Service Training Program 2	3	3	-	NSTP 111
<b>TOTAL</b>		<b>23</b>	<b>22</b>	<b>3</b>	

<b>FIRST YEAR</b>					
<b>MIDTERM</b>					
<b>Code</b>	<b>Course Title</b>	<b>Units</b>	<b>Lec</b>	<b>Lab</b>	<b>Prerequisite</b>
CS 131	Data Structures and Algorithms	3	2	3	CS 121
Math 402	Integral Calculus	3	3	-	Math 401
Litr 102	ASEAN Literature	3	3	-	-
<b>TOTAL</b>		<b>9</b>	<b>8</b>	<b>3</b>	

<b>SECOND YEAR</b>					
<b>FIRST SEMESTER</b>					
<b>Code</b>	<b>Course Title</b>	<b>Units</b>	<b>Lec</b>	<b>Lab</b>	<b>Prerequisite</b>
CS 211	Object-Oriented Programming	3	2	3	CS 131
CS 212	Computer Organization w/ Assembly Language	3	2	3	IT 111, CS 111
IT 211	Database Management Systems	3	2	3	IT 111
IT 212	Computer Networking 1	3	2	3	IT 111
Phy 101	Calculus-Based Physics	3	2	3	Math 402
CpE 405	Discrete Mathematics	3	3	-	Math 401
GEd 109	Science, Technology and Society	3	3	-	-
PE 103	Individual and Dual Sports	2	2	-	PE 101
<b>TOTAL</b>		<b>23</b>	<b>18</b>	<b>15</b>	

<b>SECOND YEAR</b>					
<b>SECOND SEMESTER</b>					
<b>Code</b>	<b>Course Title</b>	<b>Units</b>	<b>Lec</b>	<b>Lab</b>	<b>Prerequisite</b>
CS 221	Design and Analysis of Algorithms	3	2	3	CS 131
CS 222	Advanced Object-Oriented Programming	3	2	3	CS 211
IT 221	Information Management	3	2	3	IT 111
GEd 106	Purposive Communication	3	3	-	-
GEd 107	Ethics	3	3	-	-
ES 101	Environmental Sciences	3	2	3	Phy 101
ENGG 414	Numerical Methods	3	3	-	Math 402
PE 104	Team Sports	2	2	-	PE 101
<b>TOTAL</b>		<b>23</b>	<b>19</b>	<b>12</b>	

THIRD YEAR					
FIRST SEMESTER					
Code	Course Title	Units	Lec	Lab	Prerequisite
CS 311	Automata Theory and Formal Languages	3	3	-	CS 221
CS 312	Mobile Computing	3	2	3	CS 211
IT 321	Human Computer Interaction	3	3	-	CS 222
IT 314	Web Systems and Technologies	3	2	3	CS 211
IT 331	Application Development and Emerging Technologies	3	2	3	IT 221
Math 408	Data Analysis	3	3	-	Math 401
GEEd 104	The Contemporary World	3	3	-	-
<b>TOTAL</b>		<b>21</b>	<b>18</b>	<b>9</b>	

THIRD YEAR					
SECOND SEMESTER					
Code	Course Title	Units	Lec	Lab	Prerequisite
CS 321	Programming Languages	3	3	-	CS 311
CS 322	Software Engineering	3	2	3	IT 321
CS 323	Computer Architecture	3	3	-	CS 212
CS 324	Modeling and Simulation	3	2	3	CS 221, Math 408
	<i>CS Professional Elective 1</i>	3	2	3	
Math 409	Symbolic Logic	3	3	-	Math 407
GEEd 103	Life and Works of Rizal	3	3	-	
<b>TOTAL</b>		<b>21</b>	<b>18</b>	<b>9</b>	

THIRD YEAR					
MIDTERM					
Code	Course Title	Units	Lec	Lab	Prerequisite
CS 331	CS Internship	3	-	162	Regular 3 <sup>rd</sup> Year
<b>TOTAL</b>		<b>3</b>	<b>-</b>	<b>162</b>	

FOURTH YEAR					
FIRST SEMESTER					
Code	Course Title	Units	Lec	Lab	Prerequisite
CS 411	CS Thesis 1	3	3	-	Regular 4 <sup>th</sup> Year
CS 412	Fundamentals of Data Science	3	2	3	CS 324
CS 413	Advanced Software Engineering	3	2	3	CS 322
CS 414	Artificial Intelligence	3	2	3	CS 324
CS 415	Principles of Operating Systems	3	3	-	CS 323
	<i>CS Professional Elective 2</i>	3	2	3	
<b>TOTAL</b>		<b>18</b>	<b>14</b>	<b>12</b>	

FOURTH YEAR					
SECOND SEMESTER					
Code	Course Title	Units	Lec	Lab	Prerequisite
CS 421	CS Thesis 2	3	3	-	CS 411
CS 422	Machine Learning	3	2	3	CS 414
CS 423	Social Issues and Professional Practice	3	3	-	IT 111
IT 323	Information Assurance and Security	3	2	3	IT 212
ENGG 405	Technopreneurship	3	3	-	CS 411
	<i>CS Professional Elective 3</i>	3	2	3	
<b>TOTAL</b>		<b>18</b>	<b>15</b>	<b>9</b>	

A student must take 9 units of any offered CS Professional Electives listed below.					
Code	Course Title	Units	Lec	Lab	Prerequisite
CS 325	Computational Science	3	2	3	IT 331
CS 326	Graphics and Visual Computing	3	2	3	IT 322
CS 424	Parallel and Distributed Computing	3	2	3	CS 415
CS 425	Systems Fundamentals	3	2	3	CS 322
IT 223	Computer Networking 2	3	2	3	IT 212
NTT 401	Computer Networking 3	3	2	3	NT 01
NTT 402	Internet-of-Things (IoT)	3	2	3	NT 01
NTT 404	Cloud Computing	3	2	3	NT 02
NTT 405	Cybersecurity	3	2	3	NT 01

