

Bachelor of Science in Computer Science

BSCS curriculum effective AY 2012-2013

FIRST YEAR (First Semester)

	Lect	Lab	Units
GE (AH, Comm in English)	3	0	3
GE (SSP) ¹	3	0	3
GE (MST) ^{1,2}	3	0	3
Math 17 (Algebra & Trigonometry)	5	0	5
CS 11 (Computer Programming I)	2	3	3
P.E.			(2)
	16	3	17

FIRST YEAR (Second Semester)

	Lect	Lab	Units
Philo I (Philo Analysis)	3	0	3
GE (AH)	3	0	3
GE (MST)	3	0	3
Math 53 (Elementary Analysis II)	5	0	5
CS 12 (Computer Programming II)	2	3	3
P.E.			(2)
	16	3	17

SECOND YEAR (First Semester)

	Lect	Lab	Units
English 10 (College English)	3	0	3
Math 54 (Elementary Analysis II)	5	0	5
CS 32 (Data Structures)	3	0	3
CS 30 (Discrete Math for CS)	3	0	3
CS 21 (Comp Org & Asm Lang Prog)	3	3	4
NSTP ³			(3)
P.E.			(2)
	17	3	18

SECOND YEAR (Second Semester)

	Lect	Lab	Units
Fil 40 (Wika, Kultura at Lipunan)	3	0	3
CS 135 (Algorithm Design & Analysis)	3	0	3
Math 55 (Elementary Analysis III)	5	0	5
Physics 71 (Elementary Physics I)	4	0	4
CS 140 (Operating Systems)	2	3	3
CS 150 (Programming Languages)	2	3	3
NSTP			(3)
P.E.			(2)
	19	6	19

THIRD YEAR (First Semester)

	Lect	Lab	Units
Comm 3 English	3	0	3
Physics 72 (Elementary Physics II)	4	0	4
Stat 130 (Intro to Math Stat for CS)	3	0	3
CS 165 (Database Systems)	2	3	3
CS 191 (Software Engineering I)	3	0	3
GE (MST)	3	0	3
	18	3	19

THIRD YEAR (Second Semester)

	Lect	Lab	Units
Kas I (Kasaysayan ng Pilipinas)	3	0	3
CS 130 (Mathematical Methods in CS)	3	0	3
CS 145 (Computer Networks)	2	3	3
CS 180 (Artificial Intelligence)	3	0	3
CS 192 (Software Engineering II)	2	3	3
CS 153 (Intro to Computer Security)	3	0	3
CS 194 (Undergraduate Seminar)	1	0	1
	17	6	19

SUMMER

CS 195 (Practicum)	3	0	3
	3	0	3

FOURTH YEAR (First Semester)

	Lect	Lab	Units
Math, Science or Eng'g elective ⁴	3	0	3
STS (Science, Tech. & Society)	3	0	3
CS 133 (Automata Theory & Computation)	3	0	3
CS 198 (Special Problems I)	1	6	3
CS 131 (Numerical Methods)	3	0	3
GE (SSP)	3	0	3
	16	6	18

FOURTH YEAR (Second Semester)

	Lect	Lab	Units
PI 100 (The Life & Works of Rizal)	3	0	3
CS 196 (Seminar on EPIC)	1	0	1
CS 199 (Special Problems II)	1	6	3
Or CS 200 (Undergraduate Thesis)			
Computer Science elective	3	0	3
Free elective	3	0	3
GE (SSP)	3	0	3
	14	6	16

Total number of units = 146

¹ Six (6) units of GE subjects must be in Philippine Studies in any domain.

² A GE (MST) subject whose content is substantially covered in the required courses in the BS CS curriculum may not be taken for credit as a GE subject.

³ As a requirement for graduation, all students are required to take the one-year programming in one of the following components: a.) Military Training Service/ROTC; b.) Civic Welfare Training Service.

⁴ Any Math, Science or Engineering subject approved by the program adviser.

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Course Description

Course No.	Course Name	Course Description	Prerequisite/ Corequisite	Credits
CS 11	Computer Programming I	Introduction to computer science. Problem-solving strategies. Algorithm development. Coding conventions. Debugging. Fundamental programming constructs: types, control structures, functions, I/O. Basic data structures.	Co: Math 17 or equiv. 5h (2 lec, 3 lab)	3 u.
CS 12	Computer Programming II	Advanced programming techniques. Recursion. Abstract data types: stacks, queues, linked structures. Programming interfaces. Introduction to object-oriented programming: classes, inheritance, polymorphism. Event-handling. Exception handling. API programming	Pre: CS 11	3 u.
CS 21	Computer Organization & Assembly Language Programming	Digital logic and data presentation. Computer architecture and organization. Interfacing and I/O strategies. Memory architecture. Functional organization. Multiprocessing. Graphics system. Assembly language programming.	Pre: CS 12/ES 26/equiv. 6h	4 u.
CS 30	Discrete Mathematics for Computer Science	Combinatorial structures and their applications to computer science.	Pre: Math 17 Co: Math 53	3 u.
CS 32	Data Structures	Concepts, algorithms & applications of complex data structures: tables, trees, graphs, heaps, generalized lists, multilinked structures. Basic algorithmic techniques & analysis: sorting algorithms, hash tables, binary search trees, balanced trees.	Pre: CS 12/ES 26/equiv.	3 u.
CS 120	Internet Technologies	Programmer-oriented survey of contemporary authoring, distributing, implementation of current Internet tools; security & privacy issues.	Pre: CS 32/COI	3 u.
CS 130	Mathematical Methods in Computer Science	Vector spaces. Linear transformations. Matrices & determinants. Ordinary differential equations & systems of ordinary differential equations; Fourier series; Laplace transforms.	Pre: Math 55	3 u.
CS 131	Numerical Methods	Interpolations, numerical differentiation & integration. Numerical solutions of algebraic & transcendental equations, systems of equations, ordinary & partial differential equations.	Pre: CS 12, CS 130	3 u.
CS 133	Automata Theory & Computation	Alphabet, words, languages and algorithmic problems, finite automata and hierarchy of languages, Turing machines, tractable and intractable problems, uncomputable functions, the halting problem.	CS 30	3 u.
CS 135	Algorithm Design & Analysis	Algorithms analysis: asymptotic analysis, time & space tradeoffs, recurrence relations. Greedy, divide & conquer, heuristics & other algorithm design strategies. Fundamental computing algorithms for sorting, selection, trees & graphs. Intractability & approximation.	Pre: CS 32, CS 30	3 u.
CS 140	Operating Systems	Survey of operating systems. Memory management: virtual memory, segmentation, paging, fetch & replacement policies. Processor & process management: scheduling, concurrency, synchronization & mutual exclusion, deadlock. Device management. Security. File systems: sequential, direct access, & indexed sequential files. Implementation of file organization.	Pre: CS 21	3 u.
CS 145	Computer Networks	Network models & layers; terminal & file transfer protocols; message handling protocols; concurrency; network interconnection; distributed computation; overview of networking & communication software.	Pre: CS 140	3 u.
CS 150	Programming Languages	History & overview of programming languages. Programming paradigms: imperative, functional, object-oriented, logical. Type systems. Data & execution control. Declaration & modularity. Introduction to syntax & semantics. Introduction to language translation.	Pre: CS 32	3 u.
CS 153	Introduction to Computer Security	Computer security models and protocols. Security issues. Cryptographic algorithms and digital signatures. Risk	Pre: CS 140 Co: CS 145,	3 u.

		assessment.	CS 192	
CS 165	Database Systems	Database concepts: data independence, architecture, models, administration, relational algebra & calculus, normalization, structured query language, query optimization, transactions, concurrency, recovery, security. Survey of database management systems.	Pre: CS 135	3 u.
CS 171*	Topics in Theoretical Computer Science	-	Pre: COI	3 u.
CS 172*	Topics in Net-Centric Computing	-	Pre: COI	3 u.
CS 173*	Topics in Software Technology	-	Pre: COI	3 u.
CS 174*	Topics in Computer Systems	-	Pre: COI	3 u.
CS 175*	Topics in Computational Science	-	Pre: COI	3 u.
CS 176*	Topics in Intelligent Systems	-	Pre: COI	3 u.
CS 180	Artificial Intelligence	Fundamental principles of artificial intelligence. Search methods. Knowledge representation & reasoning. Agents. Machine learning & neural works. Current research applications.	Pre: CS 32, COI	3 u.
CS 191	Software Engineering I	Principles of software engineering. Software project management, requirements engineering, systems analysis and design.	Pre: CS 32, JS	3 u.
CS 192	Software Engineering II	Software architecture & design patterns, software quality assurance; software implementation & maintenance.	Pre: CS 191	3 u.
CS 194	Undergraduate Research Seminar	-	Pre: JS	1 u.
CS 195	Practicum	-	Pre: CS 192	3 u.
CS 196	Seminar on Ethical & Professional Issues in Computing	-	Pre: SS	1 u.
CS 197*	Special Topics	-	Pre: SS	3 u.
CS 198	Special Problems I	-	Pre: CS 192, SS	3 u.
CS 199	Special Problems II	-	Pre: CS 198	3 u.
CS 200	Undergraduate Thesis	-	Pre: CS 198	3 u.

* may be taken twice, topic to be indicated for record purposes.

COI: Consent of Instructor

JS: Junior Standing

SS: Senior Standing