

## B Tech Computer Science Syllabus

NIIT University (NU) aims to provide exceptional education, based on its [four core principles](#), in an effort to shape multi-faceted careers and ignite ingenuity among young minds.

NU's industry-linked [B Tech CSE](#) programme prepares students for the industry and makes them job-ready. Discover what we offer as a part of the curriculum.

### B Tech Computer Science: CURRICULUM STRUCTURE

Students are required to complete a total of 176 credits spread over 40 Courses and 2 Capstone Projects, 1 R&D Project, optional 1 Advanced R&D Project and 1 Industry Practice in the area of 'Computer Science and Engineering' and related subject areas and specialization to accomplish B Tech degree.

Category of Course	NU
Basic Sciences (MBS)	20
Engineering Sciences (ESC)	22
Humanities and Social Science (HSS)	18
Professional Core Course (PCC)	52
Professional Electives Course (PEC)	20
Open Electives Course (OEC)	12
Project Work, Internship and Industry Practice (PRJ)	32
Environmental Sciences (EVS)	Audit Course
<b>Total Credits to be Earned</b>	<b>176</b>

**B Tech Computer Science: STUDY PLAN**

I	II	III	IV	V	VI	VII	VII I
Calculus	Algebra & Differential Equation	Probability and Random Process	Design and Analysis of Algorithms	Computer Networks	Multi-device Programming	Professional Elective III	Industry Practice
Fundamentals of Electronics	Science II	Digital Logic and Circuit	Theory of Computation	Software Engineering	Professional Elective I	Professional Elective IV	
Science I	Environmental Science	Discrete Mathematics	Computer Architecture & Organization	Open Elective I	Professional Elective II	Professional Elective V	
Fundamentals of Computer Programming	Data Structures	Object Oriented Programming	Operating Systems	Compiler Design	R & D Project	Open Elective II	
Engineering Graphics / Workshop Practice	Engineering Graphics / Workshop Practice	Introduction to Commn. Systems	Database Management Systems	Digital Image Processing	Capstone Project I	Open Elective III	
HSSM-I / Comm. Skills	HSSM-I / Comm. Skills	HSSM-II	HSSM-III	HSSM-IV	HSSM-V	Capstone Project II	
Community Connect	Community Connect	Community Connect	Community Connect	Community Connect	Community Connect		
22	21	23	23	23	23	24	

**NIIT UNIVERSITY****B Tech Computer Science: Curriculum for 1st Year of (Semester I & Semester II)**

A systematic exposure to scientific, mathematical and engineering principles will be given to the students during the first two semesters. In each of these semesters, the students will take one course each in Physics, Chemistry, Mathematics, Electronics, Foundation of Computer Programming and Data Structures course and Technical English.

**Semester I**

#	Course Code	Course Title	L	T	P	C	Course Type
1	MAT 112	Calculus	3	1	0	4	MBS
2		Science - I	3	0	2	4	MBS
3	EL 111	Fundamentals of Electronics	3	1	0	4	ESC
4	TA 111	Fundamentals of Computer Programming	2	0	4	4	ESC
5	TA 212	Workshop Practice	1	0	4	3	ESC
6	TA 102	Communication Skills	2	0	2	3	HSS
7	NU 111	Community Connect	0	0	2	1	
		Total Credits:	<b>14</b>	<b>2</b>	<b>12</b>	<b>22</b>	

**MBS: 8      ESC: 11      HSS: 3**

**Semester II**

#	Course Code	Course Title	L	T	P	C	Course Type
1	MAT 101	Algebra and Differential Equations	3	1	0	4	MBS
2		Science - II	3	0	2	4	MBS
3	CS 102	Data Structures	3	0	2	4	PCC
4	EL 101	Digital Logic and Circuit	3	0	2	4	PCC
5	TA 202	Engineering Graphics	2	0	2	3	ESC
6		HSSM-I	3	0	0	3	HSS
7	NU 111	Community Connect	0	0	2	1	
		Total Credits:	<b>17</b>	<b>1</b>	<b>8</b>	<b>22</b>	

**MBS: 8      ESC: 3      PCC: 8      HSS: 3**

**NIIT UNIVERSITY****B Tech Computer Science: Curriculum for 2nd Year (Semester III & Semester IV)**

At the beginning of the third semester, each student will enter his/her chosen area (Computer Science & Engineering). Students are required to complete 46 Credits in 2<sup>nd</sup> year (Semester III & Semester IV).

**Semester III**

#	Course Code	Course Title	L	T	P	C	Course Type
1	MAT 221	Probability & Random Process	3	1	0	4	MBS
2	CS 122	Computer Architecture & Organisation	3	0	2	4	PCC
3	CS 201	Design & Analysis of Algorithms	3	0	2	4	PCC
4	CS 232	Discrete Mathematics	3	1	0	4	MBS
5	CS 251	Object Oriented Programming	2	0	4	4	PCC
6		HSSM-II	3	0	0	3	HSS
7	NU 211	Community Connect	0	0	2	1	
		Total Credits:	<b>17</b>	<b>2</b>	<b>8</b>	<b>23</b>	

**MBS: 8****ESC: 0****PCC: 12****HSS: 3****Semester IV**

#	Course Code	Course Title	L	T	P	C	Course Type
1	CS New	Computer Networks and Data Communication	3	0	2	4	PCC
2	CS 231	Database Management Systems	3	0	2	4	PCC
3	EL 302	Digital Image Processing	3	0	2	4	ESC
4	CS 211	Operating Systems	3	0	2	4	PCC
5	CS 302	Theory of Computation	3	1	0	4	PCC
6		HSSM-III	3	0	0	3	HSS
7	NU 212	Community Connect	0	0	2	1	
		Total Credits:	<b>18</b>	<b>1</b>	<b>8</b>	<b>23</b>	

**PCC: 16****ESC: 4****HSS: 3**

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## B Tech Computer Science: Curriculum for 3rd Year (Semester V & Semester VI)

During 3<sup>rd</sup> year of study, each student will have a choice of selecting one open elective course in semester -V and specialization wise two professional elective courses in semester-VI, along with one Capstone project-I and one R & D project. Students are required to complete 46 Credits in 3<sup>rd</sup> year (Semester V & Semester VI).

### Semester V

#	Course Code	Course Title	L	T	P	C	Course Type
1	CS 322	Artificial Intelligence	3	0	2	4	PCC
2	CS 3132	Cloud Computing Concepts	3	0	2	4	PCC
3	CS 252	Cryptography	3	1	0	4	PCC
4	CS 301	Software Engineering	3	0	2	4	PCC
5		Open Elective - I	3	0	2	4	OEC
6		HSSM-IV	3	0	0	3	HSS
7	NU 311	Community Connect	0	0	2	1	
		Total Credits:	<b>18</b>	<b>1</b>	<b>8</b>	<b>23</b>	

**PCC: 20**

**ESC: 0**

**OEC: 4**

**HSS: 3**

### Semester VI

#	Course Code	Course Title	L	T	P	C	Course Type
1	CS 332	Compiler Design	3	1	0	4	PCC
2		Professional Elective – I	3	0	2	4	PEC
3		Professional Elective – II	3	0	2	4	PEC
4	CS 392	Capstone Project -- I	2	0	4	4	PRJ
5	NU 302	R & D Project	1	0	6	4	PRJ
6		HSSM-V	3	0	0	3	HSS
7	NU 312	Community Connect	0	0	2	1	
		Total Credits:	<b>15</b>	<b>1</b>	<b>14</b>	<b>23</b>	

**PCC: 4**

**PEC: 8**

**PRJ: 8**

**HSS: 3**

**NIIT UNIVERSITY****B Tech Computer Science: Curriculum for 4th Year (Semester VII & Semester VIII)**

During semester VII, students have a choice of selecting three professional elective courses and two open elective courses, along with Capstone project II. Students are required to complete 44 Credits in 4<sup>th</sup> year (Semester VII and Semester VIII). In the final semester, the students are required to complete the [Industry Practice](#).

**Semester VII**

#	Course Code	Course Title	L	T	P	C	Course Type
1		Professional Elective – III	3	0	2	4	PEC
2		Professional Elective – IV	3	0	2	4	PEC
3		Professional Elective – V	3	0	2	4	PEC
4		Open Elective – II	3	0	2	4	OEC
5		Open Elective – III	3	0	2	4	OEC
6		Capstone Project -- II	2	0	4	4	PRJ
7	NU 312	Community Connect	0	0	2	1	
		Total Credits:	<b>17</b>	<b>0</b>	<b>14</b>	<b>24</b>	

**PEC: 12****OEC: 8****PRJ: 4****Semester VIII**

#	Course Code	Course Title	L	T	P	C	Course Type
1	NU402	Industry Practice / Project	0	0	40	20	PRJ
		Total Credits:	<b>0</b>	<b>0</b>	<b>40</b>	<b>20</b>	

**PRJ: 20**

**NIIT UNIVERSITY****PROFESSIONAL ELECTIVE COURSES****Semester VI**

<b>Course Code</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Course Type</b>
<b>Data Science</b>						
DS 402	Big Data Concepts	2	0	4	4	PEC
CS 491	Natural Language Processing	3	0	2	4	PEC
<b>Cyber Security</b>						
CS 461	Introduction to Information Security	3	0	2	4	PEC
CS 511	Systems and Network Security	3	0	2	4	PEC
<b>Artificial Intelligence</b>						
CS 322	Artificial Intelligence	3	0	2	4	PEC
CS 4111	Computer Vision	3	0	2	4	PEC
<b>Big Data Engineering</b>						
DS 402	Big Data Concepts	2	0	4	4	PEC
CS 481	Information Retrieval	3	1	0	4	PEC
<b>Cloud Computing</b>						
CS 3132	Cloud Computing Concepts	3	0	2	4	PEC
CS 3142	Advance Computer Networks	3	0	2	4	PEC

**PROFESSIONAL ELECTIVE COURSES****Semester VII**

<b>Course Code</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Course Type</b>
<b>Data Science</b>						
DS 412	Inferential Statistics for Data Science	2	0	4	4	PEC
DS 432	Predictive Modeling for Data Science	2	0	4	4	PEC

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CS 4121	Web Intelligence and Algorithms	3	0	2	4	PEC
<b>Cyber Security</b>						
CS 4151	Cyber Security	3	0	2	4	PEC
CS 572	Cyber Forensics	3	0	2	4	PEC
CS 4201	Blockchain Technology and Application	3	0	2	4	PEC
<b>Artificial Intelligence</b>						
CS 491	Natural Language Processing	3	0	2	4	PEC
CS 342	Artificial Neural Network	3	1	0	4	PEC
CS 4131	Machine Learning	3	1	0	4	PEC
<b>Big Data Engineering</b>						
CS 3102	Dimensional and NoSQL Databases	3	0	2	4	PEC
CS 4121	Web Intelligence and Algorithms	3	0	2	4	PEC
CS 451	Data Mining	3	0	2	4	PEC
<b>Cloud Computing</b>						
CS 4211	Parallel & Distributed Computing	3	0	2	4	PEC
CS 4221	Cloud Services and Technologies	1	0	6	4	PEC
CS 4231	Fog and Edge Networks	3	0	2	4	PEC