

Indian Institute of Technology Tirupati
 Department of Computer Science and Engineering (CSE)
 B.Tech Curriculum Template (2023 batch onwards)

Semester 1		
Course Code	Course	L-T-P-C
PH104L/CY104L	Introduction to Classical Physics / Chemistry for Engineers	2-1-0-3
PH103P/CY103P	Physics Laboratory / Chemistry Laboratory	0-0-3-2
MA103L	Engineering Mathematics-I	3-1-0-4
ES104M	Computer Programming	2-0-3-4
ES105L	Foundations of Engineering Mechanics	2-1-0-3
ES106L	Introduction to Electrical Systems	2-0-0-2
ES101M	Concepts in Engineering and Design	1-0-2-2
HS10XN	Language Course (P/F)	2-0-0-2
	NSS/NSO [#]	
Life Skills courses (Creative Arts / Physical Wellness / Lifestyle Management)		
	Semester Credits (Cumulative Credits)	22 (22)

Semester 2		
Course Code	Course	L-T-P-C
CY104L/PH104L	Chemistry for Engineers / Introduction to Classical Physics	2-1-0-3
CY103P/ PH103P	Chemistry Laboratory / Physics Laboratory	0-0-3-2
MA104L	Engineering Mathematics-II	3-0-0-3
EA105M	Engineering Drawing	2-0-2-3
EA104P	Makers Laboratory	0-0-3-2
ES108L	Introduction to Electronic Systems	2-0-0-2
ES109L	Introduction to Data Science and Machine Learning	2-1-0-3
CS101M	Object Oriented Programming	2-0-3-4
Life Skills courses (Creative Arts / Physical Wellness / Lifestyle Management)		
	Semester Credits (Cumulative Credits)	22 (44)
Summer – Socially/locally relevant project through NSO/NSS [#]		

Semester 3		
Course Code	Course	L-T-P-C
CS204L	Data Structures and Algorithms	3-1-0-4
CS204P	Data Structures and Algorithms Laboratory	0-0-3-2
CS207L	Discrete Mathematics for Computer Science	3-1-0-4
CS210M	Digital Logic Design	2-1-2-4
CS211L	Software Engineering	3-0-0-3
MAE	Mathematics Elective	3-0-0-3
PH105L	Introduction to Quantum Science and Technology	2-1-0-3
Life Skills courses (Creative Arts / Physical Wellness / Lifestyle Management)		
Semester Credits (Cumulative Credits)		23 (67)

Semester 4		
Course Code	Course	L-T-P-C
CS2XXL	Theory of Computation	3-0-0-3
CS2XXL	Design and Analysis of Algorithms	3-0-0-3
CS2XXL	Artificial Intelligence	3-0-0-3
CS209L	Computer Organisation and Architecture	3-0-0-3
CS209M	Computer Organisation and Architecture Laboratory	1-0-2-2
CS212P	Software Systems and Tools Laboratory	0-0-3-2
ES204L	Ecology, Environment and Sustainability	2-0-0-2
HSE-1	Humanities Elective 1	3-0-0-3
Life Skills courses (Creative Arts / Physical Wellness / Lifestyle Management)		
Semester Credits (Cumulative Credits)		21 (88)
Summer – Socially/locally relevant project through NSS/NSO [#]		

Semester 5		
Course Code	Course	L-T-P-C
CS3XXL	Computer Networks	3-0-0-3
CS3XXL	Compiler Design	3-0-0-3
CS309L	Operating Systems	3-0-0-3
CS3XXL	Machine Learning	3-0-0-3
CS3XXP	Intelligent Systems Laboratory	0-0-3-2
DPE-1	Department Elective 1	3-0-0-3
FRE-1	Free Elective 1	3-0-0-3
HSE-2	Humanities Elective 2	3-0-0-3
Life Skills courses (Creative Arts / Physical Wellness / Lifestyle Management)		
Semester Credits (Cumulative Credits)		23 (111)

Semester 6		
Course Code	Course	L-T-P-C
CS3XXM	Database Systems	3-0-2-4
CS312P	Computer Networks Laboratory	0-0-3-2
CS313P	Compiler Design Laboratory	0-0-3-2
CS314P	Operating Systems Laboratory	0-0-3-2
FRE-2	Free Elective 2	3-0-0-3
FRE-3	Free Elective 3	3-0-0-3
Life Skills courses (Creative Arts / Physical Wellness / Lifestyle Management)		
Semester Credits (Cumulative Credits)		16 (127)
Summer – Industrial/Research Internship*		
* Internship is not mandatory. However, students who complete industrial or research internship (minimum of 8 weeks) will earn 2 credits against free elective in Semester 7, if recommended by the Department. Students who complete a long industrial internship (minimum of 24 weeks) will earn 6 credits against Project 2 in Semester 8, if recommended by the Department. See the structure of the following Semesters for details.		

Choice of Study Plans Available

All students must choose one of the five study plans given below.

	Summer Internship (Min. of 8 weeks)	Extended Internship (Min. of 24 weeks)	Project 2
Study Plan A	√	×	√*
Study Plan B	√	×	×
Study Plan C	×	√	×
Study Plan D	×	×	√*
Study Plan E	×	×	×

** For these study plans, as per the Senate resolution, it is necessary to obtain Grade B or better in Project 1 done during Semester 7.*

- For Study Plans A and B: Summer Internship must be done after completion of Semester 6 and before beginning of Semester 7 for a minimum of 8 weeks.
- For Study Plan C: Extended Internship must be done after completion of Semester 6 and before beginning of Semester 8 for a minimum of 24 weeks.
- For Study Plans D and E: No internship activity during summer after Semester 6 or in Semester 7.

Study Plan A (for B.Tech. programs)

Students must have grade B or better in Project 1 to choose this study plan

Course Code	Course	L-T-P-C
Semester 7		
CS491G	Project Phase - I	--- 3
DPE-2	Department Elective 2	3-0-0-3
DPE-3	Department Elective 3	3-0-0-3
CS391G	Industrial/Research Internship (Evaluation of internship done in the preceding summer, P/F course)	--- 2
	Semester Credits (Cumulative Credits)	11 (138)
Semester 8		
CS492G	Project Phase - II	--- 6
CS402M	Computer Systems Security	2-0-2-3
FRE-4	Free Elective 4	3-0-0-3
HS4XXL	Professional Ethics	1-0-0-1
	Semester Credits (Cumulative Credits)	13 (151)

Study Plan B (for B.Tech. programs)

Course Code	Course	L-T-P-C
Semester 7		
CS491G	Project Phase - I	--- 3
DPE-2	Department Elective 2	3-0-0-3
DPE-3	Department Elective 3	3-0-0-3
CS391G	Industrial/Research Internship (Evaluation of internship done in the preceding summer, P/F course)	--- 2
	Semester Credits (Cumulative Credits)	11 (138)
Semester 8		
DPE-4	Department Electives 4	3-0-0-3
DPE-5	Department Electives 5	3-0-0-3
CS402M	Computer Systems Security	2-0-2-3
FRE-4	Free Elective 4	3-0-0-3
HS4XXL	Professional Ethics	1-0-0-1
	Semester Credits (Cumulative Credits)	13 (151)

Study Plan C (for B.Tech. programs)

Course Code	Course	L-T-P-C
Semester 7		
CS392G	Industrial/Research Internship (Evaluation of internship to be done before beginning of Semester 8, P/F course)	- - - 6
	Semester Credits (Cumulative Credits)	6 (133)
Semester 8		
CS491G	Project Phase - I	- - - 3
CS402M	Computer Systems Security	2-0-2-3
DPE-2	Department Elective 2	3-0-0-3
DPE-3	Department Elective 3	3-0-0-3
FRE-4	Free Elective 4	2-0-0-2
FRE-5	Free Elective 5	3-0-0-3
HS4XXL	Professional Ethics	1-0-0-1
	Semester Credits (Cumulative Credits)	18 (151)

Study Plan D (for B.Tech. programs)

Students must have grade B or better in Project 1 to choose this study plan

Course Code	Course	L-T-P-C
Semester 7		
CS491G	Project Phase - I	- - - 3
DPE-2	Department Elective 2	3-0-0-3
DPE-3	Department Elective 3	3-0-0-3
FRE-4	Free Elective 4	2-0-0-2
	Semester Credits (Cumulative Credits)	11 (138)
Semester 8		
CS492G	Project Phase - II	- - - 6
CS402M	Computer Systems Security	2-0-2-3
FRE-5	Free Elective 5	3-0-0-3
HS4XXL	Professional Ethics	1-0-0-1
	Semester Credits (Cumulative Credits)	13 (151)

Study Plan E (for B.Tech. programs)

Course Code	Course	L-T-P-C
Semester 7		
CS491G	Project Phase - I	- - - 3
DPE-2	Department Elective 2	3-0-0-3
DPE-3	Department Elective 3	3-0-0-3
FRE-4	Free Elective 4	2-0-0-2
	Semester Credits (Cumulative Credits)	11 (138)
Semester 8		
FRE-4	Department Elective 4	3-0-0-3
FRE-5	Department Elective 5	3-0-0-3
CS402M	Computer Systems Security	2-0-2-3
FRE-5	Free Elective 5	3-0-0-3
HS4XXL	Professional Ethics	1-0-0-1
	Semester Credits (Cumulative Credits)	13 (151)

Details of NSS Activity and Socially/Locally Relevant Project

At present 80 hours of NSS work is mandatory requirement for UG degree. A student is allowed to earn these hours by participating in different activities organized by the NSS team.

In the proposed curriculum NSS activity will be divided into three segments for a total of 90 hours.

- (a) 30 hours of mandatory participation in activities organized by the NSS team as earlier.
- (b) 30 hours of mandatory project work in a socially/locally relevant project during the summer after Semester 2. The student will identify, formulate and propose a solution to socially/locally relevant issues. The students are encouraged to work in their local communities. NSS team will form detailed guidelines for the same.
- (c) The project work in point (b) will be evaluated by an appropriate committee formed by NSS.
- (d) If the project is recommended for the next phase, in the summer after Semester 4 the students can complete the same and submit a final report to earn 30 hours of work.
- (e) If the project is not recommended by the NSS committee, then the student must earn another 30 hours through regular NSS activity.

Few of the best projects, if any, will be recognized and recommended by the NSS committee to the Institute's Innovation Council for consideration of financial support.

Details of Life Skills courses

To complete this course requirement, a student must register in any of the Life Skills courses such as creative arts (music/dance/painting etc.), physical wellness (sports/yoga/martial arts etc.) and lifestyle management courses (organized by GCU/health center etc.) during course registration on ERP. These activities (of about 30 hours) must be completed by Semester 6 with a Pass Grade.