



Bharatiya Vidya Bhavan's

Sardar Patel Institute of Technology

(Autonomous Institute Affiliated to University of Mumbai)

[Knowledge is Nectar]

Liberal, Pi-Model of Engineering Education @ SPIT

CURRICULUM STRUCTURE FOR UNDERGRADUATE ACADEMIC PROGRAMS AT SPIT W.E.F. A.Y. 2023-24

Preamble: Government of Maharashtra has directed Autonomous Colleges to revise their curriculum and step into the implementation of National Education Policy (NEP) 2020. We commit ourselves to the effective and fruitful implementation of NEP 2020 in its spirit. The holistic development of learners has always been the priority and center of focus for “Bharatiya Vidya Bhavan”. S.P.I.T. started implementing the philosophy of NEP in the year 2019 itself. We have in fact graduated the first batch of our holistic curriculum in 2023. Now based on our learnings from the implementation and recent recommendations of the Government, we are pleased to offer a 2nd iteration of our holistic curriculum for 2023-27, a Liberal Pi Model of Engineering Education.

This curriculum aims at the development of an **all-rounded** personality. It follows a **holistic** approach to education, ensures strong science, and mathematics foundation and program core, develops expertise in domain vertical through the sequel of electives, ensures significant exposure to additional discipline through a “Multidisciplinary Minor” courses, imparts state of the art practical knowledge through a semester-long industry / research internship, collaborates outside world for the imparting relevant skill courses, challenges good learners through “Honors” evaluation, and systematically develops soft skills, and social, physical, mental, spiritual personality through carefully articulated **Liberal Learning** and **Humanities** sequels. Thus, it offers a unique, liberal “**Pi-Model**” of Engineering Education.

Table 1: Nomenclature of the courses in the curriculum

Abbreviation	Course Category
BSESC	Basic Science & Engineering Science Courses
BSESEC	Basic Science & Engineering Science Elective Courses
SEC	Skill Enhancement Course
AEC	Ability Enhancement Course
HSSMC	Humanities and Social Science in Management Courses
CC	Cocurricular Courses
IKS	Indian Knowledge System
UHV	Universal Human Values
PCC	Program Core Courses
PEC	Program Elective Courses
OEC	Open Elective Courses
ELC	Experiential Learning Courses
MDM	Multidisciplinary Minor
CP	Community Project
HC	Honor Courses
DMC	Double Minor Course

Indicative List of BSESE Courses:

- Engineering Physics
- Engineering Chemistry
- Biology for Engineers
- Engineering Mechanics
- Engineering Graphics
- Material Science
- Environmental Science
- Thermal & Fluid Engineering

Table 2: Comparison of S.P.I.T. credit structure with the G.R. recommendations

SPIT											
Sem	BSES	SEC	AEC	HSSM	CC(LLC)	PCC	PEC	OE	EXP LEARNING	MDM	Total
I	11	5	1.5		1						18.5
II	11	5	1.5		1				2		20.5
III	6	2		2	1	12					23
IV	3	2		2	1	12				3	23
V						16			2	4	22
VI		2				8	6		2	3	21
VII							6	3	4	4	17
VIII								3	12		15
Total	31	16	3	4	4	48	12	6	22	14	160
%	19.38	10	1.875	2.5	2.5	30	7.5	3.75	13.75	8.75	100
G.R. (NEP-2020) Recommended											
Total	30	10	8	4	4	44	20	8	22	14	164
%	18.3	6.1	4.88	2.44	2.44	27	12.2	4.88	13.42	8.54	100

Figure 1: Comparison of S.P.I.T. credit structure with the G.R. recommendations

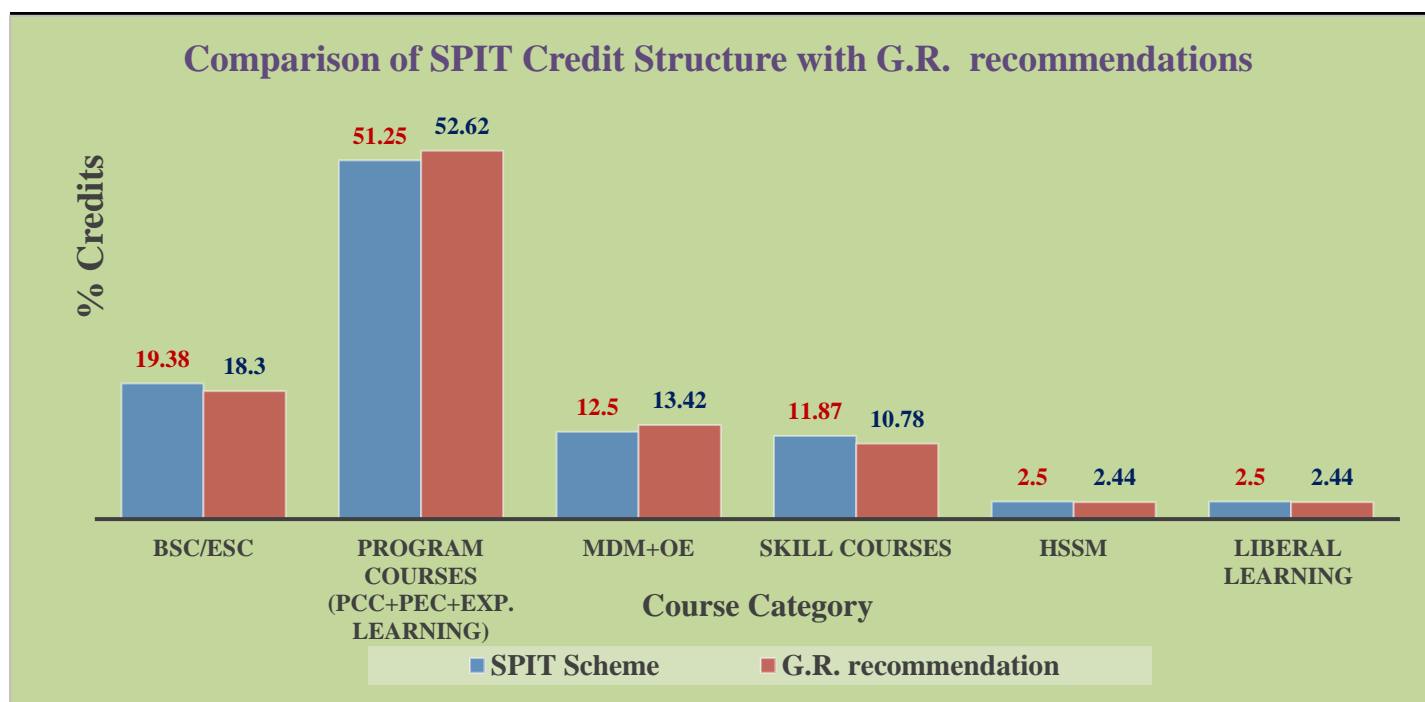


Figure 2: Pie-chart of vertical-wise allocation of credits

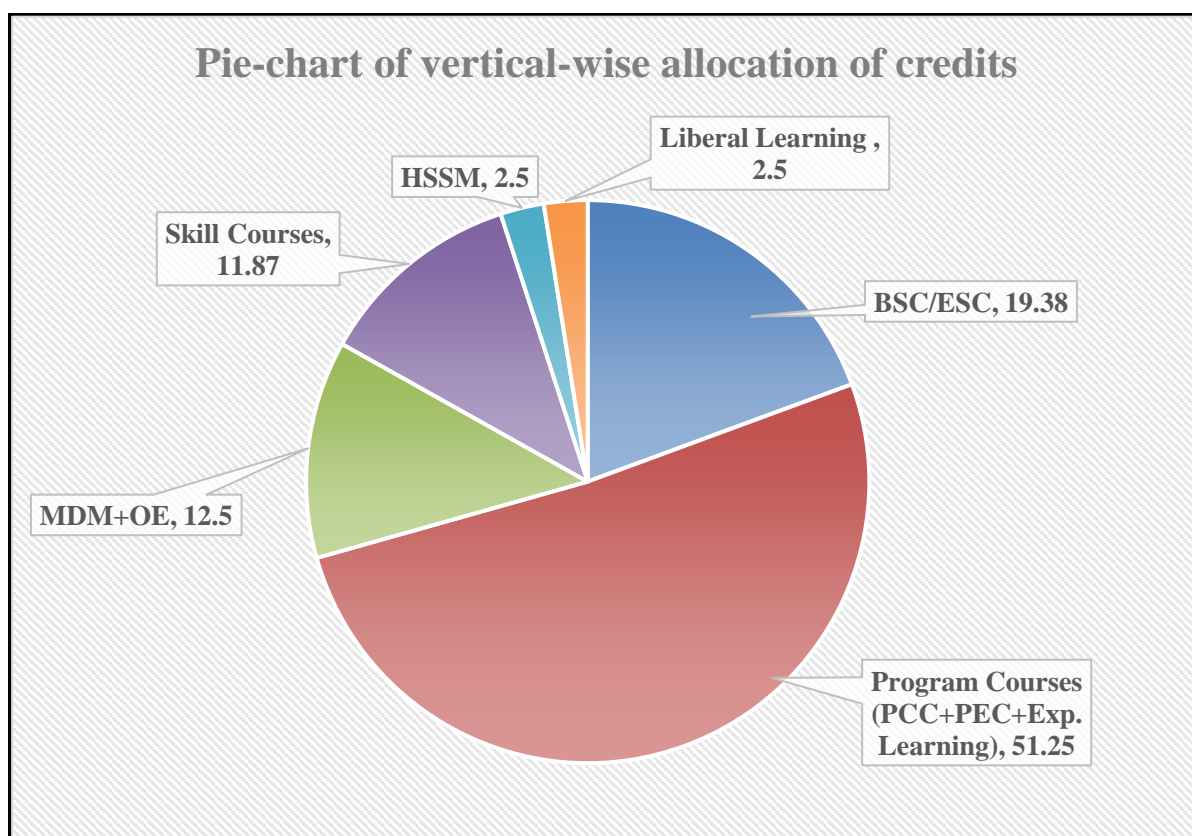


Table 3: Semester-wise allocation of credits to different verticals

SEM I			
Course Category	Abbreviation	Course Name	Credits
Basic & Engg. Sciences	BSES	Mathematics I	4
Skill enhancement course	SEC	Programming I	3
Basic & Engg. Sciences Elective	BSESE	Course I	3
Skill enhancement course	SEC	Tech Shop/Soft Skill I	2
Basic & Engg. Sciences	BSES	DS/BEE	4
Ability enhancement course	AEC	IKS / UHV	1.5
Cocurricular Courses	CC (LLC)	LLC--I	1
Total			18.5

SEM II			
Course Category	Abbreviation	Course Name	Credits
Basic & Engg. Sciences	BSES	Mathematics II	4
Skill enhancement course	SEC	Programming II	3
Basic & Engg. Sciences Elective	BSESE	Course II	3
Skill enhancement course	SEC	Tech Shop/Soft Skill I	2
Basic & Engg. Sciences	BSES	DSM/BEE	4
Ability enhancement course	AEC	IKS / UHV	1.5
Cocurricular Courses	CC (LLC)	LLC--II	1
Total			18.5

Experiential Learning	CP (in Summer)	Community Project	2
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SEM-III			
Course Category	Abbreviation	Course Name	Credits
Basic & Engg. Sciences	BSES	Program Specific Maths-I	3
Skill enhancement course	SEC	Soft Skill II/ Programming lab III	2
Basic & Engg. Sciences Elective	BSESE	Course III	3
Humanities	HSSM-I	Course I	2
Program Core Courses	PCC	3 to 4 courses	12
Cocurricular Courses	CC (LLC)	LLC--III	1
Total			23
Honor Courses	HC (Optional)	Honors Paper I	3

SEM-IV			
Course Category	Abbreviation	Course Name	Credits
Basic & Engg. Sciences	BSES	Program Specific Maths-II	3
Skill enhancement course	SEC	Soft Skill II/ Programming lab III	2
Humanities	HSSM-II	Course II	2
Program Core Courses	PCC	3 to 4 courses	12
Cocurricular Courses	CC (LLC)	LLC--IV	1
Multidisciplinary Minor	MDM	MDM-I	3
Total			23
Honor Courses	HC (Optional)	Honors Paper II	3

- Industry internship for min one month earning 2 credits for interested students
- Research internship of minimum 2 months for the Honors through Research students for 4 credits
- For Honors through Research students, it is mandatory to do the mini project in the 5th semester.

SEM-V			
Course Category	Abbreviation	Course Name	Credits
Experiential Learning	ELC	Industry Internship / Mini Project I	2
Program Core Courses	PCC	4 to 5 courses	16
Multidisciplinary Minor	MDM	MDM-II	4
Total			22
Honor	HC (Optional)	Honors Paper III	3

SEM-VI			
Course Category	Abbreviation	Course Name	Credits
Program Core Courses	PCC	2 to 3 courses	8
Multidisciplinary Minor	MDM	MDM-III	3
Experiential Learning	ELC	Main Project Stage I	2
Program Elective Courses	PEC	PE-I	3
Program Elective Courses	PEC	PE-II	3
Skill enhancement course	SEC	Special Lab (domain specific)	2
Total			21
Honor	HC(Optional)	Honors Paper IV	3

Students are expected to work for the project during the summer.
Research internship of minimum 2 months for the Honors through Research students for 4 credits

SEM-VII			
Course Category	Abbreviation	Course Name	Credits
Multidisciplinary Minor	MDM	MDM-IV	4
Program Elective Courses	PEC	PE-III	3
Program Elective Courses	PEC	PE-IV	3
Open Elective	OE	OE-I	3
Experiential Learning	ELC	Main Project Stage II	4
Total			17
Honor	HC (Optional)	Honors Paper V	3

SEM-VIII			
Course Category	Abbreviation	Course Name	Credits
Open Elective	OE	OE-II	3
Experiential Learning	ELC	Industry / Research Internship*	12
Total			15
Honor	HC (Optional)	Honors Paper VI	3
Experiential learning for Honors through Research	ELC (Optional)	Research	4

Indicative List of Cocurricular courses (LLC):

Course Code	Course Title
LLC01	Dance (Kathak)
LLC02	Dance (Bharatnatyam)
LLC02	Fundamentals of Photography
LLC03	Art of Short Film Making / Cinematography
LLC04	Film Appreciation
LLC05	Basics of Music Composition
LLC06	Basics of Keyboard playing
LLC07	Physical Fitness
LLC08	Self Defense for Women
LLC09	Pran-Vidya (Combo of Yoga and Pranayam)
LLC10	Jeevan Vidya (Work Life Balance)
LLC11	Integrated Personality Development-I
LLC12	Indian Knowledge System-I
LLC13	Design Thinking
LLC14	Innovation and Creativity
LLC15	Principle Centered Leadership
LLC16	Social Psychology
LLC17	Mentoring of School Children at SPIT (Abhudaya)
LLC18	Basics of Fire Safety
LLC19	Study of one of the Identified Books
LLC20	Teaching Assistantship
LLC21	Trekking
LLC22	Kannada Language
LLC23	Telugu Language
LLC24	Tamil Language
LLCXX	Any other Course approved by Dean Academics and Research

Indicative list of Multidisciplinary Minors

MDM Sequels for EXTC

- Computer Engineering
- Data Science
- AIML
- Mathematics and Statistics
- Finance
- Interface and Experience Design
- Economics

MDM Sequels for CE/CSE

- Industrial IoT
- Digital Signal Processing
- Mathematics and Statistics
- Finance
- Electronics Communication
- Economics
- VLSI

Notes:

1. Learners who earn a minimum of total 160 credits will be awarded “**B.Tech in Engg. /Tech. with Multidisciplinary Minor**” degree.
2. Learners will have the following options to earn **B. Tech. in Engg. /Tech. degree with MDM and Honors / Double Minor.**

a) B.Tech in Engg./ Tech. -Honors and Multidisciplinary Minor (with additional 18 credits): 160 +18 Credits

There will be four papers, one in each semester starting from the 3rd semester which will be based on special self-study modules mentioned in the syllabus of all core-courses (3 credits each). In 7th and 8th semester, 2 papers on Honors papers (3 credits each) comprising GATE level questions.

OR

There will be four papers, one in each semester starting from the 3rd semester which will be based on special self-study modules mentioned in the syllabus of all core-courses (3 credits each). In 7th and 8th semester students will complete 12-week FDP level courses (3 credits each) from NPTEL (The list of courses will be floated by the institute)

b) B.Tech in Engg./ Tech.- Honors with Research and Multidisciplinary Minor (additional 18 credits by research):

Students are expected to complete a 2-months research internship in summer after 2nd year (4 credits), 3rd year (4 credits) and work towards project after 4th year (4 credits). 2 NPTEL courses of FDP level (3 credits each) must be completed in semesters 7 and 8.

Credit requirements for four different options of the Degrees

Semester	I	II	III	IV	V	VI	VII	VIII	Total
B. Tech with Multidisciplinary Minor (MDM)	19	21	22.5	21.5	22	22	17	15	160
B. Tech with Honors and Multidisciplinary Minor (MDM)	19	21	22+3*	22+3*	22+3*	22+3*	17+3*	15+3*	178
B. Tech. Honors with Research and Multidisciplinary Minor	19	21	22	22+4*	22	22+4*	17+3*	15+4*+3*	178

*Optional Credits

- 3. Learner can earn the certificates based on his/her exit from the program as follows:**
- a. After a one-year (40 credits to be earned) and 8-week summer workshop: Certificate in Engineering.
 - b. After two-years (80 credits to be earned) and 8-week summer workshop: Diploma in Engineering.
 - c. After three-years (120 credits to be earned) and 8-week summer workshop:
B. Sc. Engineering.
- 4. The institute has constituted a technical support team for registration of Academic Bank of Credits (ABC).**

Dr. Y. S. Rao
Dean Academics & Research

Dr. B. N. Chaudhari
Principal