Department of

INFORMATION TECHNOLOGY (IT)

Programme Structure
of

B. Tech - Information Technology

Summary Table
Distribution of Category / Type of Courses and Credits
B.Tech – Information Technology
(All Specializations)

Category / Type of Courses		Semester wise Credits								Course wise Total Credits (available)
		I	II	III	IV	V	VI	VII	VIII	
BSC/ESC	Basic Science Courses	6	6	3						15
	Engineering Science Courses	7	4	4						15
Program Courses	Programme Core Course (PCC)		2	11	11	10	8	8		49
	Programme Core Course (PEC)					4	6	6	6	22
Multidisciplinary Courses	Multidisciplinary Minor (MDM)				4		4	4	2	14
	Open /Generic Electives (OE/GE) *(other thana particular Program)*	3	3			2				8
Skill Courses	Vocational and Skill Enhancement Courses (VSEC)	2	2		2	2				8
MD Holistic Development Courses- Liberal Learning(LL)	Ability Enhancement courses (AEC)	2	2	2			1			7
	Indian Knowledge System (IKS)		1							2
	Value Education/Value Addition/Professional Ethics/Life skills Courses (VEC/VAC/EVLSC) / SCIL			2		2	2			6
	Co-curricular Courses (CC)	2	2							4
	Entrepreneurship/Economics /Management Courses			2	2					4
Experiential Learning Courses	Research Methodology									0
	Mini Projects/ Field Project (MP/FP)				2		2			4
	Project / Internship					2		2	10	14
Total Credits (Semester/Programme)		22	22	24	21	22	23	20	18	172

MAJOR PROGRAMME COURSES -TOTAL CREDITS	98
MULTIDISCIPLINARY COURSES-TOTAL CREDITS	22
HOLISTIC DEVELOPMENT COURSES INCL LL+HSSM-TOTAL CREDITS	22

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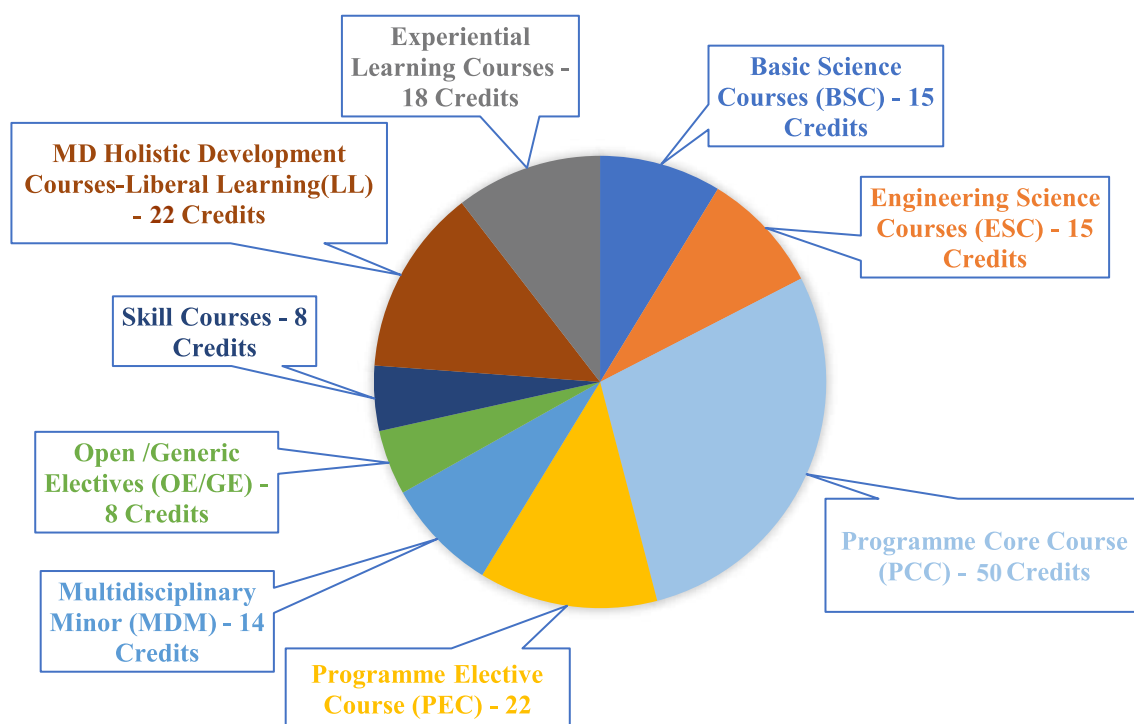PUNE, INDIA
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Distribution of Category / Type of Courses and Credits
B.Tech – Information Technology
(All Specializations)

CATEGORY / TYPE OF COURSES AND CREDITS ASSIGNED

Experiential Learning Courses - 18 Credits

Basic Science Courses (BSC) - 15 Credits

MD Holistic Development Courses-Liberal Learning(LL) - 22 Credits

Engineering Science Courses (ESC) - 15 Credits

Skill Courses - 8 Credits

Open /Generic Electives (OE/GE) - 8 Credits

Programme Core Course (PCC) - 50 Credits

Multidisciplinary Minor (MDM) - 14 Credits

Programme Elective Course (PEC) - 22

Flow Diagram to Navigate students through availability of various types of courses and options during the Programme duration

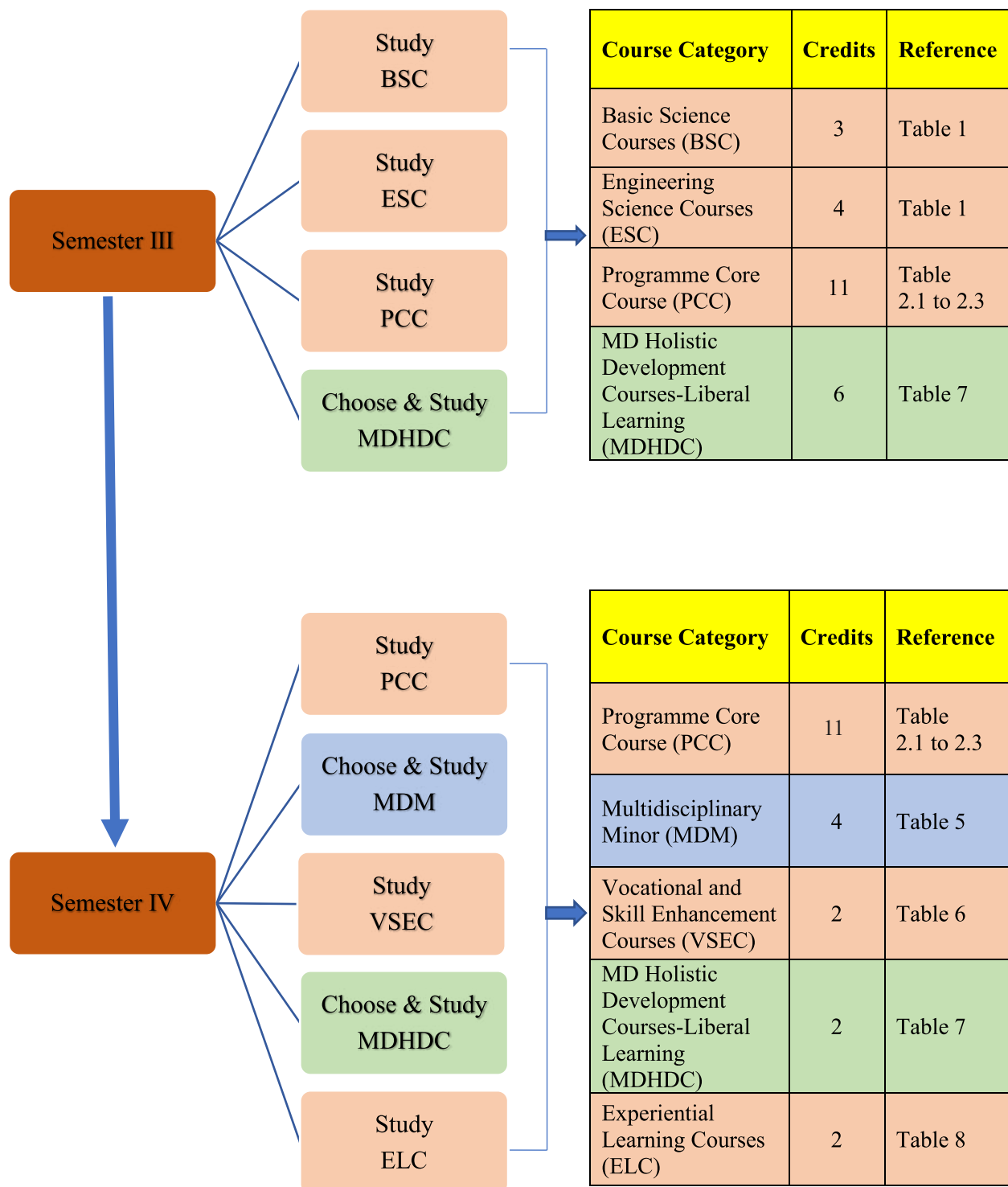### B.Tech. - Information Technology- First Year

(All Specializations)

Semester I

- Study BSC
- Study ESC
- Choose & Study OE/GE
- Study VSEC
- Choose & Study MDHDC

Course Category	Credits	Reference
Basic Science Courses (BSC)	6	Table 1
Engineering Science Courses (ESC)	7	Table 1
Open/Generic Elective Courses (OE/GE)	3	Table 4
Vocational and Skill Enhancement Courses (VSEC)	2	Table 6
MD Holistic Development Courses-Liberal Learning (MDHDC)	4	Table 7

Semester II

- Study BSC
- Study ESC
- Study PCC
- Choose & Study OE/GE
- Study VSEC
- Choose & Study MDHDC

Course Category	Credits	Reference
Basic Science Courses (BSC)	6	Table 1
Engineering Science Courses (ESC)	4	Table 1
Programme Core Course (PCC)	2	Table 2.1 to 2.3
Open/Generic Elective Courses (OE/GE)	3	Table 4
Vocational and Skill Enhancement Courses (VSEC)	2	Table 6
MD Holistic Development Courses-Liberal Learning (MDHDC)	5	Table 7

B.Tech. - Information Technology- Second Year

Semester III

- Study BSC
- Study ESC
- Study PCC
- Choose & Study MDHDC

Course Category	Credits	Reference
Basic Science Courses (BSC)	3	Table 1
Engineering Science Courses (ESC)	4	Table 1
Programme Core Course (PCC)	11	Table 2.1 to 2.3
MD Holistic Development Courses-Liberal Learning (MDHDC)	6	Table 7

Semester IV

- Study PCC
- Choose & Study MDM
- Study VSEC
- Choose & Study MDHDC
- Study ELC

Course Category	Credits	Reference
Programme Core Course (PCC)	11	Table 2.1 to 2.3
Multidisciplinary Minor (MDM)	4	Table 5
Vocational and Skill Enhancement Courses (VSEC)	2	Table 6
MD Holistic Development Courses-Liberal Learning (MDHDC)	2	Table 7
Experiential Learning Courses (ELC)	2	Table 8

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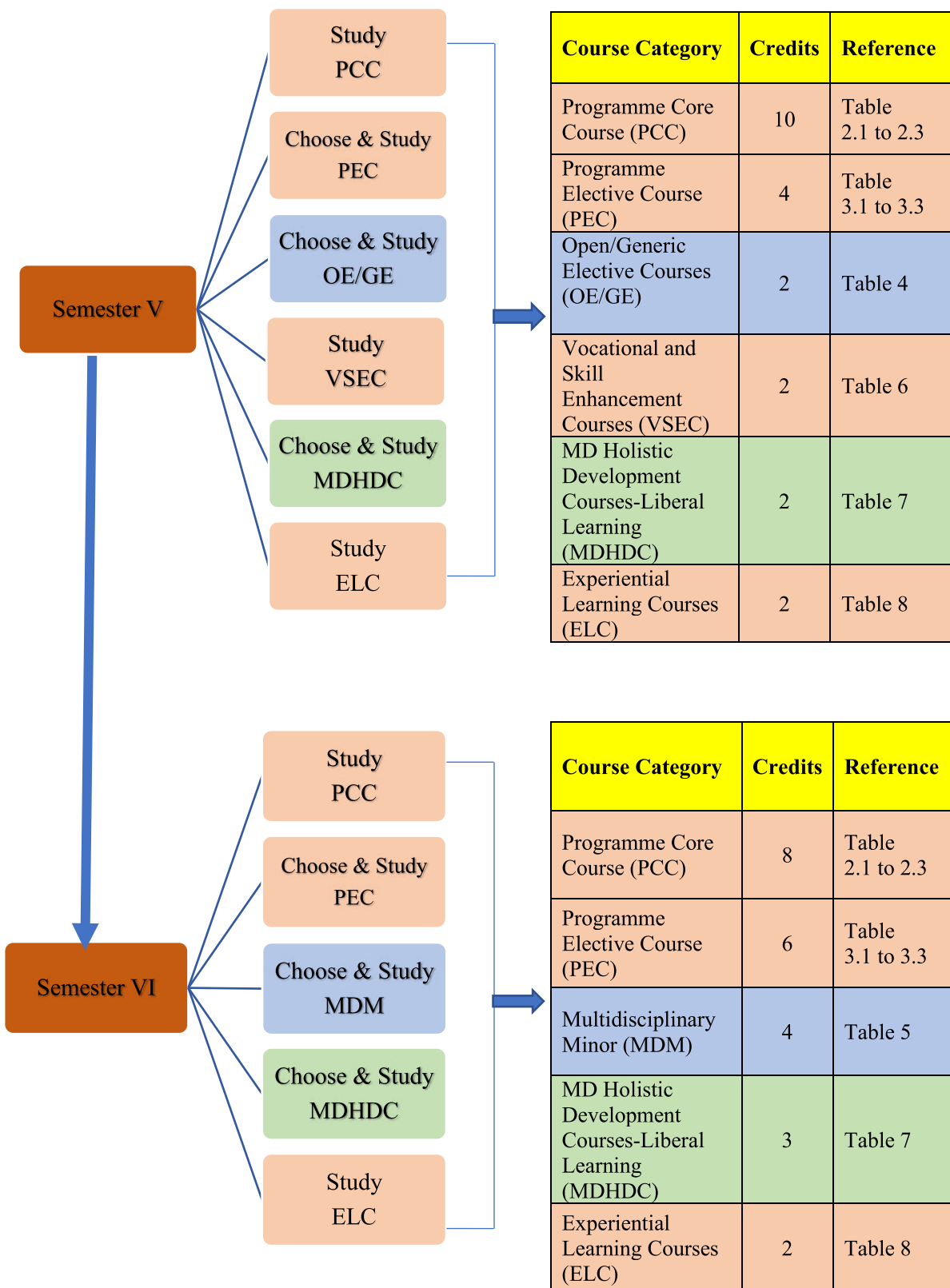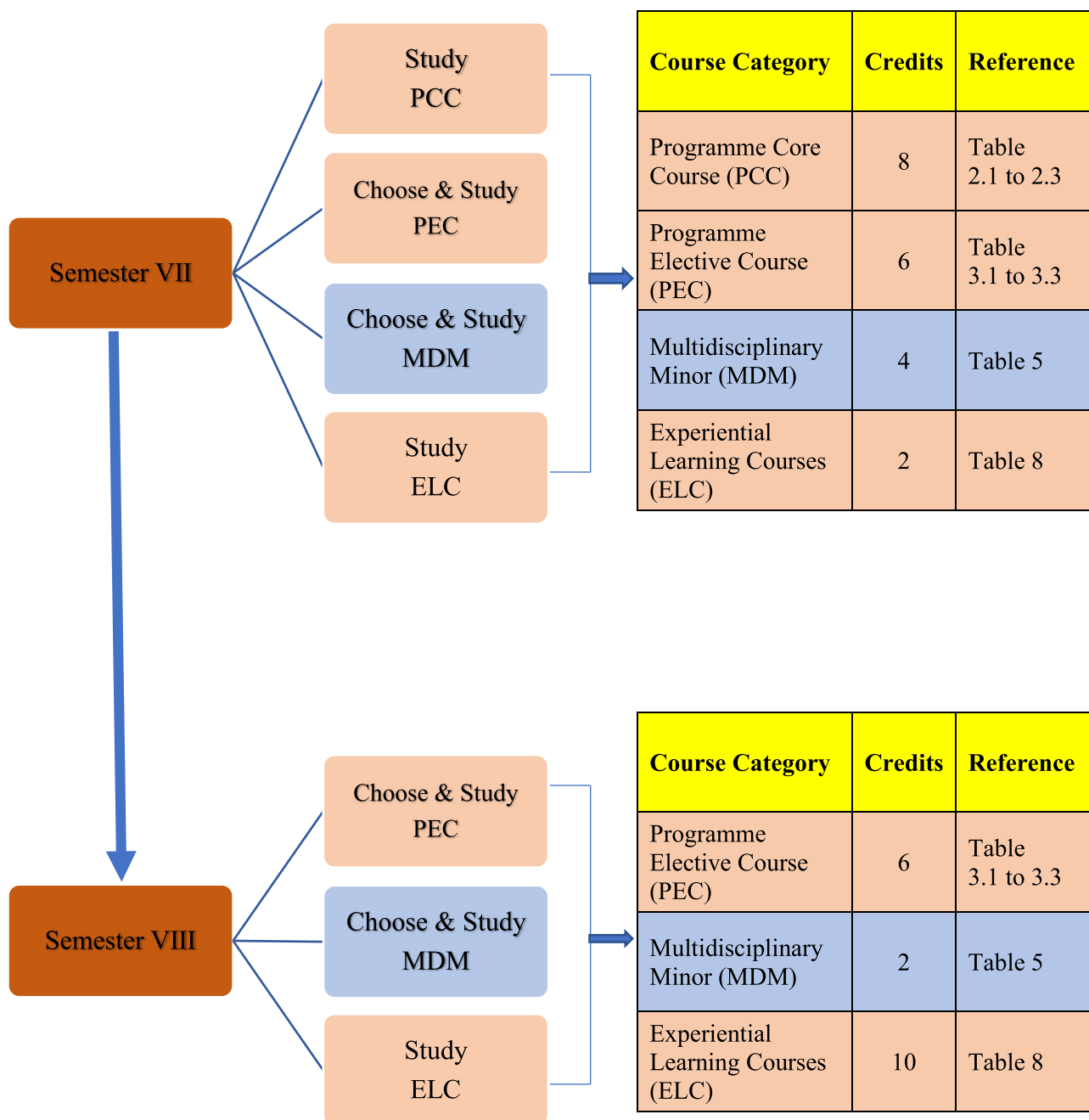
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B.Tech. - Information Technology- Third Year

Semester V

- Study PCC
- Choose & Study PEC
- Choose & Study OE/GE
- Study VSEC
- Choose & Study MDHDC
- Study ELC

Course Category	Credits	Reference
Programme Core Course (PCC)	10	Table 2.1 to 2.3
Programme Elective Course (PEC)	4	Table 3.1 to 3.3
Open/Generic Elective Courses (OE/GE)	2	Table 4
Vocational and Skill Enhancement Courses (VSEC)	2	Table 6
MD Holistic Development Courses-Liberal Learning (MDHDC)	2	Table 7
Experiential Learning Courses (ELC)	2	Table 8

Semester VI

- Study PCC
- Choose & Study PEC
- Choose & Study MDM
- Choose & Study MDHDC
- Study ELC

Course Category	Credits	Reference
Programme Core Course (PCC)	8	Table 2.1 to 2.3
Programme Elective Course (PEC)	6	Table 3.1 to 3.3
Multidisciplinary Minor (MDM)	4	Table 5
MD Holistic Development Courses-Liberal Learning (MDHDC)	3	Table 7
Experiential Learning Courses (ELC)	2	Table 8

B.Tech. - Information Technology- Fourth Year

Semester VII

Study PCC

Choose & Study PEC

Choose & Study MDM

Study ELC

Course Category	Credits	Reference
Programme Core Course (PCC)	8	Table 2.1 to 2.3
Programme Elective Course (PEC)	6	Table 3.1 to 3.3
Multidisciplinary Minor (MDM)	4	Table 5
Experiential Learning Courses (ELC)	2	Table 8

Semester VIII

Choose & Study PEC

Choose & Study MDM

Study ELC

Course Category	Credits	Reference
Programme Elective Course (PEC)	6	Table 3.1 to 3.3
Multidisciplinary Minor (MDM)	2	Table 5
Experiential Learning Courses (ELC)	10	Table 8

Table 1
Basic Sciences & Engineering Sciences Courses
B.Tech – Information Technology
(All Specializations)

Sr. No.	Course Title	No. of Credits	Name of the Department /Institute/School	Semester in which Course is offered	Remarks
1	Applied Science –I	3	ASH	I	BSC
2	Mathematics Course – I	3	ASH	I	BSC
3	Applied Sciences – II	3	ASH	II	BSC
4	Mathematics Course – II	3	ASH	II	BSC
5	Mathematics Course - III	3	ASH	III	BSC
6	Computational Thinking	2	CSE	I	ESC
7	Programming Language – I	1	IT	I	ESC
8	Electronics Engineering – I	3	CSE	I	ESC
9	Computer Engineering Workshop	1	CSE	I	ESC
10	Programming Language – II	1	IT	II	ESC
11	Electronics Engineering – II	3	CSE	II	ESC
12	Electronics Engineering – III	3	CSE	III	ESC
13	Programming Language – III	1	CSE	III	ESC

Table 2.1
Programme Core Courses

B.Tech - Information Technology

Specialization: IT Core

Sr. No.	Course Title	No. of Credits	Semester in which Course is offered	Sr. No.	Course Title	No. of Credits	Semester in which Course is offered
1	Introduction to Data Structures	2	II	9	Software Designing and Quality Management	3	V
2	Data Structure and Analysis of Algorithms	3	III	10	Theory of Computation	4	V
3	Computer Networks	3	III	11	Fundamentals of Machine Learning	3	V
4	Computer Organization & Architecture	3	III	12	Information Security	3	VI
5	Data Structure and Analysis of Algorithms Laboratory	2	III	13	AI - ML	3	VI
6	Database Management Systems	3	IV	14	AI - ML Laboratory	2	VI
7	Operating Systems	4	IV	15	Deep Learning	4	VII
8	Web Technology	4	IV	16	Cloud Computing	4	VII

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Table 2.2
Programme Core Courses

B.Tech - Information Technology

Specialization: Data Analytics

Sr. No.	Course Title	No. of Credits	Semester in which Course is offered	Sr. No.	Course Title	No. of Credits	Semester in which Course is offered
1	Introduction to Data Structures	2	II	9	Software Designing and Quality Management	3	V
2	Data Structure and Analysis of Algorithms	3	III	10	Computer Networks	3	V
3	Data Science and Engineering	3	III	11	Fundamentals of Machine Learning	3	V
4	Computer Organization & Architecture	3	III	12	Theory of Computation	3	VI
5	Data Structure and Analysis of Algorithms Laboratory	2	III	13	AI-ML	3	VI
6	Database Management Systems	3	IV	14	AI-ML Laboratory	2	VI
7	Operating Systems	4	IV	15	Deep Learning	4	VII
8	Data Modelling and Visualization	4	IV	16	Big Data Engineering	4	VII

Table 2.3
Programme Core Courses

B.Tech - Information Technology

Specialization: Software and Mobile Application Development

Sr. No.	Course Title	No. of Credits	Semester in which Course is offered	Sr. No.	Course Title	No. of Credits	Semester in which Course is offered
1.	Introduction to Data Structures	2	II	9.	Mobile Application Development with iOS - II	3	IV
2.	Data Structure and Analysis of Algorithms	3	III	10.	Mobile Application Security	3	V
3.	Computer Networks	3	III	11.	AI/ML	3	V
4.	Mobile Application Development with iOS - I	3	III	12.	Game Programming	3	VI
5.	Data Structure and Analysis of Algorithms Laboratory	2	III	13.	Cross Platform App Development	4	VI
6.	Database Management Systems	3	IV	14.	Game Programming Lab	2	VI
7.	Operating Systems	4	IV	15.	Cognitive Computing	4	VII
8.	Web Technology	4	IV	16.	DevOps	4	VII

Table 3.1
Program/Specialization Elective Courses
B.Tech – Information Technology
Specialization: IT Core

Sr. No.	Elective Basket No.	Course Title	No. of Credits	Semester in which Course is offered
1.	C - EL 1	Computer Vision	4	V
		Information Storage and Management	4	
		Full Stack Development	4	
2.	C - EL 2	Soft Computing	3	VI
		Pattern Recognition Techniques	3	
		Wireless Sensor Networks	3	
3.	C - EL 3	Introduction to Robotics	3	VI
		Product Engineering and Management	3	
		High Performance Computing	3	
4.	C - EL 4	Usability Engineering	3	VII
		Data Mining and Data Warehouse	3	
		Principles of Compiler Design	3	
5.	C - EL 5	Operations Research	3	VII
		DevOps	3	
		Cognitive Computing	3	
6.	C - EL 6	Context Aware Pervasive System	3	VIII
		Big Data Analytics	3	
		Artificial Neural Networks	3	
7.	C - EL 7	Natural Language Processing	3	VIII
		Digital Twinning	3	
		Internet of Things	3	

Table 3.2
Program/Specialization Elective Courses
B.Tech – Information Technology

Specialization: Data Analytics

Sr. No.	Elective Basket No.	Course Title	No. of Credits	Semester in which Course is offered
1.	DA - EL 1	Mobile Computing	4	V
		Computer Vision	4	
		Information Storage and Management	4	
2.	DA - EL 2	Soft Computing	3	VI
		Pattern Recognition Techniques	3	
		Multivariate Programming	3	
3.	DA - EL 3	High Performance Computing	3	VI
		Introduction to Robotics	3	
		Internet of Things	3	
4.	DA - EL 4	User Experience Design	3	VII
		Data Mining and Data Warehouse	3	
		Data Protection and Governance	3	
5.	DA - EL 5	Operations Research	3	VII
		DevOps	3	
		Cognitive Computing	3	
6.	DA - EL 6	BlockChain Technology	3	VIII
		Artificial Neural Networks	3	
		Business Intelligence	3	
7.	DA - EL7	Natural Language Processing	3	VIII
		Digital Twinning	3	
		Context Aware Pervasive System	3	

Table 3.3
Program/Specialization Elective Courses
B.Tech – Information Technology

Specialization: Software and Mobile Application Development

Sr. No.	Elective Basket No.	Course Title	No. of Credits	Semester in which Course is offered
1.	SMAD - EL 1	Kotlin Programming	4	V
		Cloud Computing	4	
		Design Patterns and UI Testing	4	
2.	SMAD - EL 2	Mobile and Ubiquitous Computing	3	VI
		Computer Forensics	3	
		Pattern Recognition Techniques	3	
3.	SMAD - EL 3	Product Engineering and Management	3	VI
		Mobile Forensics	3	
		Internet of Things	3	
4.	SMAD - EL 4	Usability Engineering	3	VII
		Mobile App Development with iOS III	3	
		Data Protection and Governance	3	
5.	SMAD - EL 5	Machine Learning	3	VII
		Operations Research	3	
		Blockchain Technology	3	
6.	SMAD - EL 6	Business Intelligence	3	VIII
		Big Data Analytics	3	
		Context Aware Pervasive System	3	
7.	SMAD - EL 7	Natural Language Processing	3	VIII
		Digital Twinning	3	
		Mobile App Development with iOS IV	3	

Table 4
Open/ Generic Elective Courses
B.Tech – Information Technology
(All Specializations)

Sr. No.	Elective Basket No.	Course Title	No. of Credits	Name of the Department/ Institute/ School	Semester in which Course is offered
1	OGE 1	Drawing & Painting-1	3	SOFA	I
		Sculpture Clay Modelling-1	3	SOFA	
		Photography- 1	3	SOFA	
		Intercultural Appreciation and Exchange-1	3	SOFA	
		Indian Classical Music (Vocal)-1	3	SOFA	
		Light Classical & Popular Music (Vocal)-1	3	SOFA	
		Classical Dance- Kathak-1	3	SOFA	
		Event Management-1	3	MITCOM	
		Instrumental Music-Harmonium / Key-board-1	3	SOFA	
		Instrumental Music – Tabla-1	3	SOFA	
		Instrumental Music – Guitar-1	3	SOFA	
		Drama-1	3	SOFA	

Table 4 (contd.)

2	OGE 2	Drawing & Painting-2	3	SOFA	II
		Sculpture Clay Modelling- 2	3	SOFA	
		Photography- 2	3	SFT	
		Intercultural Appreciation and Exchange-2	3	SOFA	
		Indian Classical Music (Vocal)-2	3	SOFA	
		Light Classical and Popular Music (Vocal)-2	3	SOFA	
		Classical Dance- Kathak-2	3	SOFA	
		Event Management-2	3	MITCOM	
		Instrumental Music- Harmonium / Key-board-2	3	SOFA	
		Instrumental Music – Tabla-2	3	SOFA	
		Instrumental Music – Guitar-2	3	SOFA	
		Drama-2	3	SOFA	
		Digital Filmmaking and Appreciation	3	SOFA	
3	OGE3	DeepTech in Finance	2	MITCOM	V
		BioInformatics	2	SBSR	
		Circular Economy	2	MITCOM	
		Digital Marketing	2	MITCOM	
		Innovation and Venture Building	2	SCIL	
		Music Lessons	2	SOFA	
		Photography	2	SOFT	
		Classical Music in film	2	SOFA	

Table 5
Multidisciplinary Minors (MDM)
B.Tech – Information Technology
(All Specializations)

Sr. No.	Minor Title	Course Title	No. of Credits	Semester in which Course is offered	Name of the Department/ Institute/ School
1	Bioinformatics	Introduction to Bioinformatics	4	4	SBSR
		AI ML for drug design	4	6	
		Genomics	4	7	
		Capstone Project	2	8	
2	UI/UX Design	To be shared by IoD	4	4	Department of UI/UX, IoD
			4	6	
			4	7	
		Capstone Project	2	8	
3	Marketing	Basics of Marketing	4	4	MITCOM
		Sales and Distribution Management	4	6	
		Product and Brand Management	4	7	
		B-to-B Marketing	2	8	

Table 6
Vocational and Skill Enhancement Courses

B.Tech – Information Technology
(All Specializations)

Sr. No.	Course Title	No. of credits	Type of Courses	Name of the department/ Institute/ School	Semester in which Course is offered
1	Design Thinking Part-I	2	VSEC	SOC	I
2	Design Thinking Part-II	2	VSEC	SOC	II
3	Programming Language – IV	2	VSEC	SOC	IV
4	Project Based Learning - III	2	VSEC	SOC	V

Table 7
Multidisciplinary Holistic Development Courses – Humanities, Social Sciences, Management + Liberal Learning

B.Tech – Information Technology
(All Specializations)

No.	Course Title	No. of Credits	Type of Courses	Name of the Department /Institute/School	Semester in which Course is offered
1.	Ability Enhancement Course – I (English language/language)	2	AEC	SHD	I
2.	Health Practices - I	2	CC	SHD	II
3.	Ability Enhancement Course – II	2	AEC	SHD	II
4.	Indian Knowledge System	1	HSSM	SVS	II
5.	Health Practices - II	2	CC	SHD	II
6.	Environmental Studies	2	HSSM	SOES	III
7.	Economics for Engineers	2	VEC	SOC	III
8.	Project Based Learning- I	2	AEC	SOC	III
9.	Entrepreneurship	2	VEC	SCIL	IV
10.	Aptitude and Professional Skills Core	2	VEC	SCIL	V
11.	Foreign Languages	1	AEC	SHD	VI
12.	Aptitude and Professional Skills Industry Readiness	2	VEC	SCIL	VI