ANNEXURE – I

Credit Structure for Undergraduate programs

Sr. No.	Category Code	Category	Credits
1	HSSM	Ability Enhancement Course (AEC), Indian Knowledge System (IKS), Value Education Course (VEC), Entrepreneurship/Economics/Management courses	**10**
2	BSC	Basic Science courses	**14**
3	ESC	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc.	**16**
4	PCC	Professional core courses	**63**
5	PEC	Professional Elective courses relevant to chosen specialization/branch	**09**
6	OE	Open subjects – Electives from other technical and /or emerging subjects	**08**
7	ELC	Project work, seminar and internship in industry or elsewhere, Industry Training and Skill Development, Capstone Course	**23**
8	VSEC	Vocations Skill Courses (VSC) , Skill Enhancement Courses(SEC)	**10**
9	CC	Co-curricular Courses (CC) such as Health and Wellness, Yoga education sports, and fitness, Cultural Activities, NSS/NCC and Fine/ Applied/ Visual/ Performing Arts	**04**
10	MDM	Compulsory Multidisciplinary Minor	**14**
		TOTAL	**171**

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GROUP 1: SEMESTER I / GROUP 2: SEMESTER II

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
				L	T	P		Continual Assessment	End Sem Examination	Total
1	BSC	AS101T	Engineering Physics & Material Sciences	2	0	-	2	15	35	50
2	BSC	AS101P	Engineering Physics & Material Sciences Lab	-	-	2	1	25	25	50
3	BSC	AS102T	Applied Mathematics – I	4	-	-	4	30	70	100
4	ESC	AS103T	Engineering Practices-I (Electrical & Electronics)	3	-	-	3	30	70	100
5	ESC	AS103P	Engineering Practices-I Lab(Electrical & Electronics)	-	-	2	1	25	25	50
6	ESC	AS104T	Logic building with C	2	-		2	15	35	50
7	ESC	AS104P	Logic building with C Lab	-	-	2	1	25	25	50
8	AEC	AS105P	Business Communication Skills I Lab	-	-	2	1	25	25	50
9	IKS	AS106T	Indian Knowledge Systems	2	-	-	2	15	35	50
10	SEC	AS107T	Career Development I	-	-	2	1	50	-	50
11	PCC	DS101T	Program Foundation I	2	-	-	2	15	35	50
12	CC	AS108T	Co-curricular Course - I	-	-	-	2	50	-	50
Total				**15**	**-**	**10**	**22**	**320**	**380**	**700**

GROUP 1: SEMESTER II / GROUP 2: SEMESTER I

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
				L	T	P	CREDIT	Continual Assessment	End Sem Examination	Total
1	BSC	AS201T	Engineering Chemistry& Environmental Science	2	-	--	2	15	35	50
2	BSC	AS201P	Engineering Chemistry& Environmental Science Lab	-	-	2	1	25	25	50
3	BSC	AS202T	Applied Mathematics–II	4	-	-	4	30	70	100
4	ESC	AS203T	Engineering Practices-II (Civil & Mechanical)	3	-	-	3	30	70	100
5	ESC	AS203P	Engineering Practices-II Lab (Civil & Mechanical)	-	-	2	1	25	25	50
6	ESC	AS204T	Problem Solving with Python	2	-	-	2	15	35	50
7	ESC	AS204P	Problem Solving with Python Lab	-	-	2	1	25	25	50
8	AEC	AS205P	Business Communication Skills II Lab	-	-	2	1	25	25	50
9	SEC	AS206T	Career Development II	-	-	2	1	50	-	50
10	PCC	DS201T	Program Foundation II	2	-	-	2	15	35	50
11	ESC	AS207T	Design Thinking	2	-		2	30	70	100
12	CC	AS208T	Co-curricular Course - II	-	-	-	2	50		50
			Total	15	-	10	22	345	405	750

SEMESTER III

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
				L	T	P		Continual Assessment	End Sem Examination	Total
1	PCC	DS301T	Mathematics for Data Science	4	-	-	4	30	70	100
2	PCC	DS302T	Object Oriented Programming	3	-	-	3	30	70	100
3	PCC	DS302P	Object-Oriented Programming Lab	-	-	2	1	25	25	50
4	PCC	DS303T	Digital Circuits & Computer Architecture	3	-	-	3	30	70	100
5	PCC	DS304P	Digital Circuits & Internet of Things Lab	-	-	4	2	25	25	50
6	PCC	DS305P	Data Science I Lab	-	-	2	1	25	25	50
7	PCC	DS306P	Web Technologies Lab	-	-	4	2	25	25	50
8	SEC	DS307P	Career Development III	-	-	2	1	50	-	50
9	VEC	DS308T	Value Education Course I	2	-	-	2	15	35	50
10	ELC	DS309P	Micro Project I *	-	-	2	1	50	-	50
			Total	12	-	16	20	305	345	650
11	MDM		Multidisciplinary Minor I	2	-	-	2	15	35	50
			Total with MDM	14		16	22	320	380	700

* Field Project or Community engagement project in the major discipline

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SEMESTER IV

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
				L	T	P		Continual Assessment	End Sem Examination	Total
1	PCC	DS401T	Data Structures & Algorithms	4	-	-	4	30	70	100
2	PCC	DS401P	Data Structures & Algorithms Lab	-	-	4	2	25	25	50
3	PCC	DS402T	Operating System	3	-	-	3	30	70	100
4	PCC	DS403T	Database Management System	3	-	-	3	25	25	50
5	PCC	DS403P	Database Management System Lab	-	-	2	1	25	25	50
6	PCC	DS404P	Data Handling & Visualization Lab	-	-	2	1	15	35	50
7	OE	DS405T	Open Elective - I	2	-	-	2	15	35	50
8	VSC	DS406T	Technical Skill Development - I	2	-	-	2	50	-	50
9	SEC	DS407P	Career Development - IV	-	-	2	1	50	-	50
10	ELC	DS408P	Micro Project II*	-	-	2	1	50	-	50
			Total	14		12	20	315	285	600
11	MDM		Multidisciplinary Minor II	3	-	-	3	30	70	100
			Total with MDM	17		16	23	345	355	700

* Field Project or Community engagement project in the major discipline

Open Elective - I	
DS405T(i)	**Data Analytics**

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ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

B. Tech. Scheme of Examination & Syllabus 2023-24

Computer Science and Engineering (Data Science)

SEMESTER V

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
				L	T	P		Continual Assessment	End Sem Examination	Total
1	PCC	DS501T	Theory of Computation	3	-	-	3	30	70	100
2	PCC	DS502T	Machine Learning for Data Science	3	-	-	3	30	70	100
3	PCC	DS502P	Machine Learning for Data Science Lab	-	-	2	1	25	25	50
4	PCC	DS503T	Software Engineering and Project Management	2	-	-	2	15	35	50
5	PCC	DS503P	Software Engineering and Project Management Lab	-	-	2	1	30	70	100
6	PCC	DS504P	Data Analytics Lab	-	-	2	1	25	25	50
7	PEC	DS505T	Professional Elective Course -I	2	-	-	2	15	35	50
8	OE	DS506T	Open Elective - II	3	-	-	3	30	70	100
9	VSC	DS507T	Technical Skill Development - II	2	-	-	2	50	-	50
10	ELC	DS508P	Mini Project	-	-	2	1	25	25	50
11	SEC	DS509P	Career Development - V	-	-	2	1	50	-	50
			Total	15		10	20	325	425	750
12	MDM		Multidisciplinary Minor III	3	-	-	3	30	70	100
			Total with MDM	18		10	23	355	495	850

Open Elective - II	
DS506T(i)	**Business Intelligence**

Professional Elective Course -I	
DS505T(i)	**Distributed Databases**
DS505(ii)	**Image Analytics**

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SEMESTER VI

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
				L	T	P		Continual Assessment	End Sem Examination	Total
1	PCC	DS601T	Natural Language Processing	3	-	-	3	30	70	100
2	PCC	DS601P	Natural Language Processing Lab	-	-	2	1	25	25	50
3	PCC	DS602T	Computer Networks	3	-	-	3	30	70	100
4	PCC	DS603P	Data Center Management and Cloud Computing Lab	-	-	4	2	25	25	50
5	PEC	DS604T	Professional Elective Course -II	3	-	-	3	30	70	100
6	AEC	AS601T	Economics. & Management	2	-	-	2	15	35	50
7	OE	DS605T	Open Elective- III	3	-	-	3	30	70	100
8	ELC	DS606P	Project - I	-	-	4	2	50	50	100
9	SEC	DS607P	Career Development - IV	-	-	2	1	50	-	50
			Total	14		12	20	285	415	700
10	MDM		Multidisciplinary Minor IV	3	-	-	3	30	70	100
			Total with MDM	17		12	23	315	485	800

Open Elective - III	
DS606T(i)	**Android App Development**

Professional Elective Course - II	
DS604T(i)	**Information Retrieval**
DS604T(ii)	**IoT & cloud data analytics**

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SEMESTER VII

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
				L	T	P		Continual Assessment	End Sem Examination	Total
1	PCC	DS701T	Big Data Analytics	3	-	-	3	30	70	100
2	PCC	DS701P	Big Data Analytics Lab	-	-	2	1	25	25	50
3	PCC	DS702T	Deep Learning	3	-	-	3	30	70	100
4	PCC	DS702P	Deep Learning	-	-	2	1	25	25	50
5	PCC	DS703T	Data Modelling and Optimization	3	-	-	3	30	70	100
6	PCC	DS703P	Data Modelling and Optimization Lab	-	-	2	1	25	25	50
7	PEC	DS704T	Professional Elective Course -III	3	-	-	3	30	70	100
8	ELC	DS705P	Project - II	-	-	8	4	50	50	100
9	ELC	DS706P	Summer/Winter Internship*	-	-	-	2	50	--	50
			Total	12		14	21	295	405	700
10	MDM		Multidisciplinary Minor V	3	-	-	3	30	70	100
			Total with MDM	15		12	24	325	475	800

* Summer / Winter Internship (Evaluation of Four weeks Internship Completion till 6th Semester)

Professional Elective Course - III	
DS704T((i)	Data Warehousing and Mining
DS704(ii)	Social and Information Network Analysis

SEMESTER VIII

Option A

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
				L	T	P		Continual Assessment	End Sem Examination	Total
1	ELC	xxxxxP*	Project based on one semester internship in Industry/Research Institute/ National Laboratories/ Incubation Center	-	-	-	12	300	100	400
			Total	**0**	**0**	**0**	**12**	**300**	**100**	**400**

*End semester examination will consist of evaluation of seminar & project report.

Option B

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
				L	T	P		Continual Assessment	End Sem Examination	Total
1	ELC	xxxxxP#	Institutional Internship	-	-	12	6	100	100	200
2	ELC	xxxxxP	Project – III	-	-	12	6	100	100	200
			Total	**0**	**0**	**0**	**12**	**300**	**100**	**400**

Option B is available to students only after recommendation of the concerned Head of the department. The project and internship should contribute towards career development plan of the students.

* Minimum 90 days internship in any industry and project is to be carried out during internship.

Two NPTEL courses (as per choice of student) or Institutional Internship by IEDC, SVPCET.

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Honors course - Business Intelligence & Social Media Analytics

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
				L	T	P		Continual Assessment	End Sem Examination	Total
1	PCC	DSH401T	Digital Marketing and Social Media Analytics	4	-	-	4	30	70	100
2	PCC	DSH501T	Data Science for Business Intelligence	3	-	-	3	30	70	100
3	PCC	DSH501P	Data Science for Business Intelligence Lab	-	-	2	1	25	25	50
4	PCC	DSH601T	BI for Social Media and Internet Marketing Analytics	4	-	-	4	30	70	100
5	PEC	DSH701T	AI and Machine Learning for Business Analytics	3	-	-	3	30	70	100
6	AEC	DSH701P	AI and Machine Learning for Business Analytics Lab	-	-	2	1	25	25	50
7	OE	DSH801T	Cyber and Social Media Intelligence Analysis	4	-	-	4	30	70	100
			Total	18		4	20	200	400	600

EXIT OPTIONS

Award of UG Certificate in Major with 40 credits and an additional 8 credits (After First Year)

EXIT COURSES			
S.N.	**Course name**	**Mode of conduction**	**Credits**
1	Data Science For Engineers By Prof. Ragunathan Rengasamy, Prof. Shankar Narasimhan | IIT Madras	NPTEL Swayam	2
2	Foundation of Data Science By Dinesh Kumar | Indian Institute of Management Bangalore (IIMB)	NPTEL Swayam	2
3	Internship	Offline/Online	4

Award of UG Diploma in Major with 80 credits and an additional 8 credits (After Second Year)

EXIT COURSES			
S.N.	**Course name**	**Mode of conduction**	**Credits**
1	Introduction to Machine Learning By Prof. Balaraman Ravindran | IIT Madras	NPTEL Swayam	4
2	Internship	Offline/Online	4

Award of UG Degree in Major with 120 credits and an additional 8 credits (After Third Year)

EXIT COURSES			
S.N.	**Course name**	**Mode of conduction**	**Credits**
1	Cloud Computing	NPTEL Swayam	4
2	Internship	Offline/Online	4