



ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR
ACCREDITED BY NAAC WITH 'A' Grade

PROGRAMME SCHEME & SYLLABI 2022 -2023

B.Tech – Computer Science & Engineering(Cyber Security)

Vision

To develop competent computing community in the field of Cyber Security in order to enhance graduates with strong academic and technical background needed to achieve distinction in the discipline.

Mision

To educate the students with basic foundation blocks of core and disciplines of Computer Science and Engineering in Cyber Security and to inculcate knowledge in lifelong learning, professional ethics and contribution to the society.

About Department

B.Tech - Computer Science & Engineering (Cyber Security) is introduced in 2022 to provide exposure & expertise about the paradigm of Cyber Security which essentially became the integral part of all industries & organizations

Cyber Security is a specialized Multidisciplinary confluence of Computer Science, Applied Mathematics, Computational Statistics, Data security and Analytics.

The Cyber Security Engineers contribute to the organization in a pivotal role of Cyber Security Engineers, Analyst, Forensic experts and Security Architects helping the companies to address complex problems and make objective decisions with strong sense of business

The objective of the program will be to provide focus on core Cyber Security subjects including Analytics, Visualization, Modelling, Knowledge representation, Database management, Techniques for various key engineering domains & decision making with strong emphasis on having hand-on experience with the help of practicals, real world case studies and industry exposure in Cyber Security Area.

Program Education Objectives(PEO's)

1. To develop the skills to adapt and participate in the key domains of Computer Science & Engineering and Cyber Security.
2. To contribute in enhancing the skills of graduates to identify the security challenges in the real world and excel in innovation and management fields with sound knowledge of Computer Science practices and Cyber security fundamentals among the graduates to meet the dynamically changing technological needs.
3. To imbibe ethical and social responsibility, multidisciplinary team spirit, proficiency in soft skills, entrepreneurship skills and leadership qualities among the students for the betterment of the society.

Program outcomes

- **PO1: Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- **PO2: Problem analysis:** Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO3: Design/Development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO4: Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

- **PO5: Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- **PO6: The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- **PO7: Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of need for sustainable development.
- **PO8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- **PO9: Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- **PO10: Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- **PO11: Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **PO12: Life-long Learning:** Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

ANNEXURE – I
ST VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY
ACADEMIC OFFICE

Credit Structure for Undergraduate programs

Sr. No	Category	Credits
1	Humanities, Social Sciences & Management courses	8
2	Basic Science courses	22
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc.	18
4	Professional core courses	67
5	Professional Elective courses relevant to chosen specialization/branch	10
6	Open subjects – Electives from other technical and /or emerging subjects	10
7	Project work, seminar and internship in industry or elsewhere	20
8	Mandatory Courses [Environmental Sciences, Induction training, Indian Constitution, Essence of Indian Knowledge Tradition]	9
9	Comprehensive Courses [Industry Training and Skill Development, Capstone Course]	7
	TOTAL	Max - 171

ANNEXURE – I

Teaching Scheme for First Year (Semester I and II) Bachelor of Engineering

GROUP 1: SEMESTER I / GROUP 2: SEMESTER II

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	AS101T	Engineering Physics & Material Sciences	4	1	-	5	30	70	100
2	AS101P	Engineering Physics & Material Sciences Lab	-	-	2	1	25	25	50
3	AS102T	Applied Mathematics – I	4	-	-	4	30	70	100
4	AS103T	Engineering Practices-I (Electrical & Electronics)	4		-	4	30	70	100
5	AS103P	Engineering Practices-I Lab(Electrical & Electronics)	-	-	2	1	25	25	50
6	AS104T	Logic building with C	3	-		3	15	35	50
7	AS104P	Logic building with C Lab			2	1	25	25	50
8	AS105T	Communication Skills	2	-	-	2	15	35	50
9	AS106P	Communication Skills Lab			2	1	25	25	50
10	AS107P	Sports / Yoga / Library			2	0			
Total			17	1	10	22	220	380	600

Induction Training 3 weeks

Teaching Scheme for First Year (Semester I and II)
Bachelor of Engineering

GROUP 1: SEMESTER II / GROUP 2: SEMESTER I

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	AS201T	Engineering Chemistry & Environmental Science	4	1	-	5	30	70	100
2	AS201P	Engineering Chemistry & Environmental Science Lab	-	-	2	1	25	25	50
3	AS202T	Applied Mathematics – II	4	-	-	4	30	70	100
4	AS202P	Computational Mathematics Lab	-	-	2	1	25	25	50
5	AS203T	Engineering Practices-I (Mechanics & drawing)	4		-	4	30	70	100
6	AS203P	Engineering Practices-I Lab(Mechanics & drawing)	-	-	2	1	25	25	50
7	AS204T	Problem Solving with Python	3	-	-	3	30	70	100
8	AS204T	Problem Solving with Python Lab	-	-	2	1	25	25	50
10	AS205T	Essence of Indian Knowledge Tradition	2			0			
11	AS206P	Sports / Yoga			2	0			
12	AS207P	Library / Tinkering & Model Lab			1	0			
Total			17	1	11	20	220	380	600

* Induction Training 3 weeks



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COMPUTER SCIENCE & ENGINEERING (CYBER SECURITY)

Scheme of Examination - THIRD SEMESTER

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	AS304T	Applied Mathematics – III	3	1	-	4	30	70	100
2	CS301T	Data Structures	4	-	-	4	30	70	100
3	CS301P	Data Structures Lab	-	-	2	1	25	25	50
4	CS302T	Digital Circuits and Fundamentals of Microprocessor	3	1	-	4	30	70	100
5	CS302P	Digital Circuits and Fundamentals of Microprocessor Lab	-	-	2	1	25	25	50
6	CS303T	Computer Networks	3	-	-	3	30	70	100
7	CS304T	Information Security Fundamentals	3	-	-	3	30	70	100
8	CS305P	Computer Lab -I	-	-	2	1	25	25	50
9	H 102	Universal Human Values - 2	3	-	-	3	30	70	100
10	CS306T	Career Development-I	2	-	-	0	Audit		
Total			21	2	6	24	255	495	750

		April 2023	1	Applicable for 2023-24
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Scheme of Examination - FOURTH SEMESTER

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	CS401T	Mathematics for Cyber Security	3	1	-	4	30	70	100
2	CS402T	Object Oriented Programming	3	1	-	4	30	70	100
3	CS402P	Object Oriented Programming lab	-	-	2	1	25	25	50
4	CS403T	Database management Systems	3	-	-	4	30	70	100
5	CS403P	Database management Systems Lab	-	-	2	1	25	25	50
6	CS404T	Operating System	3	-	-	4	30	70	100
7	CS404P	Operating System Lab	-	-	2	1	25	25	50
8	CS405P	Computer Lab-II	-	-	2	1	25	25	50
9	H103	Constitution of India	2	-	-	0	Audit		
10	CS406P	Technical Skill Development-I	-	-	2	1	50	-	50
11	CS407T	Career Development IV	2	-	-	0	Audit		
Total			16	2	10	21	270	380	650

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Scheme of Examination - FIFTH SEMESTER

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	CS501T	Theory of Computation	3	1	-	4	30	70	100
2	CS502T	Security Policy & Implementation	3	1	-	4	30	70	100
3	CS503T	Network Vulnerability Analysis and Penetration Testing	3	-	-	3	30	70	100
4	CS503P	Network Vulnerability Analysis and Penetration Testing Lab	-	-	2	1	25	25	50
5	CS504T	Elective- I	3	-	-	3	30	70	100
6	CS505T	Open Elective -I	3	-	-	3	30	70	100
7	CS506P	Computer Lab -III	-	-	2	1	25	25	50
8	AS501T	Economics and Management	3	-	-	3	30	70	100
9	CS507P	Technical Skill Development-II	-	-	2	1	50	-	50
10	CS508T	Career Development-III	2	-	-	0	Audit		
Total			20	2	6	23	280	470	750

	Elective - I		Open Elective - I
CS504T(i)	Introduction to Cloud Security	CS505T(i)	Basics of Ethical Hacking
CS504T(ii)	Security Strategies in Windows & Linux	CS505T(ii)	Security in IOT
CS504T(iii)	IOT and Security	CS505T(iii)	Fundamentals of Cryptography

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Scheme of Examination - SIXTH SEMESTER

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	CS601T	Design Analysis and Algorithms	3	-	-	3	30	70	100
2	CS601P	Design Analysis and Algorithms Lab	-	-	2	1	25	25	50
3	CS602T	Software Engineering	3	-	-	3	30	70	100
4	CS603T	Foundations of Blockchain Technology	3	-	-	3	25	25	50
5	CS603P	Cyber Security Lab	-	-	2	1	25	25	50
6	CS604T	Elective -II	3	-	-	3	30	70	100
7	CS605T	Open Elective -II	3	-	-	3	30	70	100
8	H104	Foundational Humanities Elective	2	-	-	-	Audit		
9	AS502T	English for Engineers	2	-	-	2	15	35	50
10	CS606P	Project -I	-	-	2	2	50	50	100
11	CS607T	Career Development-IV	2	-	-	0	Audit		
12	CS608P	Capstone Course - I *	-	-	2	1	25	25	50
Total			21	0	08	22	285	440	750
Open Elective - II						Elective-II			
CS605T(i)	Intrusion Detection and Prevention System					CS604T(i)	Managing risk in Information systems		
CS605T(ii)	Security strategies in Windows and Linux					CS604T(ii)	Web Security Analysis		
CS605T(iii)	Security Policy & Implementation					CS604T(iii)	Security in Distributed Computing		

Foundational Humanities Elective	
H104(i)	Development of Societies
H104(ii)	Philosophy

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Scheme of Examination - SEVENTH SEMESTER

	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	CS701T	Cyber Forensics	3	1	-	4	30	70	100
2	CS701P	Cyber Forensics Lab	-	-	2	2	25	25	50
3	CS702T	Machine Learning in Cyber Security	3	1	-	4	30	70	100
4	CS703T	Elective-III	4	-	-	4	30	70	100
5	CS704P	Network Protocol engineering Lab	-	-	2	1	25	25	50
6	CS705P	Project-II	-	-	4	4	100	100	200
7	CS706T	Open Elective-III	4	-	-	4	30	70	100
8	CS707T	Summer/winter Internship	-	-	-	2	-	50	50
9	CS708P	Capstone courses II*	-	-	2	1	25	25	50
Total			14	2	10	26	250	425	700

Elective - III	
CS702T(i)	Threats and Malware Analysis
CS702T(ii)	Information Security Audit and Monitoring
CS702T(iii)	Information Security Analysis and Compliance using Big Data
Open Elective - III	
CS704T(i)	Mobile App Security Analysis
CS704T(ii)	Open Source and Open standards
CS704T(iii)	Operational Research

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COMPUTER SCIENCE & ENGINEERING (CYBER SECURITY)

Scheme of Examination - EIGHTH SEMESTER

Option A

	Course Code	Course Title	Hours per Week			redits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Assessment	Total
1	CS801P	Project based on one semester internship in Industry/Research Institute/ National Laboratories/ Incubation Center	-	-	-	12	200	200	400
Total			-	-	-	12	200	200	400

***End Semester Examination will consist of evaluation of Seminar and Project Report**

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.

r No	Course Code	Course Title	Hours per Week			redits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Assessment	Total
1	CS801P	Institutional Internship	-	-	-	6	100	100	200
2	CS802P	Project - III	-	-	-	6	100	100	200
Total			-	-	-	12	200	200	400

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