Sri Krishna College of Engineering and Technology

An Autonomous Institution, Affiliated to Anna University

Coimbatore – 641 008

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (CYBER SECURITY)

CURRICULUM AND SYLLABI

B.E COMPUTER SCIENCE AND ENGINEERING

(Cyber Security)

REGULATION 2022 (2022-2026 Batch)

**SRI KRISHNA COLLEGE OF ENGINEERING
AND TECHNOLOGY**

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B.E COMPUTER SCIENCE AND ENGINEERING

(Cyber Security)

ABOUT THE DEPARTMENT

VISION

To be a globally renowned academic department for quality education and research in the field of Cyber security with ethical values and social commitment.

MISSION

To accomplish our vision, we are committed to:

M1: Impart comprehensive technical education to produce highly competent Cyber security professionals and Researchers.

M2: Provide an academic environment with state-of-the-art technological infrastructure to provide scalable cyber security solutions.

M3: Impart ethics, Social responsibility and necessary professional, leadership skills through student centric activities.

PROGRAMME OUTCOMES (POs)

Graduates will be able to:

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, review research literature, and analyze 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 modeling 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, and 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:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

To enable graduates to:

1. Get recognized as effective professionals for their applied skills, problem solving capabilities and professional skills in the field of cyber security.

2. Enrich skills and adopt emerging cyber security needs to pursue life-long learning and serve the society with social concern and code of ethics.

PROGRAMME SPECIFIC OUTCOMES (PSO)

Upon completion of the programme, graduates will have ability to:

PSO1 Attain the policies in information assurance and analyze the factors in an existing system and design implementations to comprehend and anticipate future challenges.

PSO2 Implement innovative cyber security solutions using standard tools, practices and technologies without compromising the privacy of individuals and entities.

PSO3 Use cyber security and cyber forensics software/tools. Design cyber-security strategies and assess cyber-security risk management policies to protect an organization's information and assets.

Mapping of PO's to PEO's

Programme Educational Objectives (PEO)	Programme Outcomes (PO)											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
PEO 1	3	3	3	3	2	2		1	2	2	2	1
PEO 2	2	2	2	1	2	3	2	2	2	2	2	3

Mapping of PO's to PSO's

Programme Specific Outcomes (PSO)	Programme Outcomes (PO)											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
PSO 1	3	3	3	3	2	2		1	2	1	1	2
PSO 2	3	3	3	3	3	2			2		1	2
PSO3	3	3	3	2	3	2		1	2	1	1	2

Mapping of PSO's & PEO's

Programme Specific Outcomes (PSO)	Programme Educational Objectives (PEO)	
	PEO1	PEO2
1	3	2
2	3	2
3	3	2

1	Reasonably agreed	**2**	Moderately agreed	**3**	Strongly agreed

SEMESTER I							
S No.	Course Code	Course	L/T/P	Contact hrs/week	Credits	Ext/Int	Category
1	22MA103	Linear Algebra and Calculus	3/1/0	4	4	60/40	BSC
2	22EE111	Basics of Electrical and Electronics Engineering	2/1/0	3	3	60/40	ESC
3	22IT101	Application Development Practices	3/0/2	5	4	50/50	PCC
4	22CS101	Problem Solving using C++	3/0/2	5	4	50/50	PCC
5	22CH101	Engineering Chemistry	3/0/2	5	4	50/50	BSC
6	22EN101	Technical Communication Skills	2/0/2	4	3	50/50	HSMC
7	22EE114	Basics of Electrical and Electronics Engineering Laboratory	0/0/2	2	1	40/60	ESC
MANDATORY COURSE							
8	22MC101	Mandatory Course I (Induction Programme)	Three weeks		0	0/100	MC
			Total	28	23	800	

SEMESTER II							
S No.	Course Code	Course	L/T/P	Contact hrs/week	Credits	Ext/Int	Category
1	22GE201	Universal Human Values	3/0/0	3	3	60/40	HSMC
2	22MA203	Mathematical Foundations of Computer Science	3/1/0	4	4	60/40	BSC
3	22CS201	Data Structures and Algorithms	3/0/2	5	4	50/50	PCC
4	22IT201	Database Management Systems	3/0/2	5	4	50/50	PCC
5	22AD201	Java Programming	3/0/2	5	4	50/50	ESC
6	22PH201	Physics	3/0/2	5	4	50/50	BSC
7	22TA101	Heritage of Tamils	1/0/0	1	1	60/40	HSMC
MANDATORY COURSE							
8	22MC102	Mandatory Course 2	2/0/0	2	0	0/100	MC
			Total	30	24	800	

SEMESTER III

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credits	Ext/Int	Category
1	22CY301	Cyber Security Essentials	3/0/0	3	3	60/40	PCC
2	22MA302	Random variable and Statistics	3/1/0	4	4	60/40	BSC
3	22IT302	Web Technology	1/0/4	5	3	50/50	PCC
4	22CS301	Advanced Java Programming	1/0/4	5	3	50/50	PCC
5	22AD301	Design and analysis of algorithms	1/0/4	5	3	50/50	PCC
6	22CS403	Operating Systems	3/0/2	5	4	50/50	PCC
7	22TA201	Tamils and Technology	1/0/0	1	1	60/40	HSMC
MANDATORY COURSE							
8	22MC1XX	Mandatory Course: 3	2/0/0	2	0	0/100	MC
			Total	**30**	**21**	**800**	

SEMESTER IV

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credits	Ext/Int	Category
1	22CY401	Ethical Hacking	3/1/0	4	4	60/40	PCC
2	22CS402	Web Frameworks	1/0/4	5	3	50/50	PCC
3	22AD401	Cloud Computing	1/0/4	5	3	50/50	PCC
4	22IT402	Software Testing	1/0/4	5	3	50/50	PCC
5	22CY402	Access Control and Identity management	3/0/2	5	4	50/50	PCC
6	22CY403	Auditing IT Infrastructure for Compliance	3/0/2	5	4	50/50	PCC
			Total	**29**	**21**	**600**	

SEMESTER V

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credits	Ext/Int	Category
1	22AD403	Python for Data Science	3/0/0	3	3	60/40	PCC
2	22CY501	Internet Security	3/1/0	4	4	60/40	PCC
3	22OEXXX	Open Elective 1	3/1/0	4	4	60/40	OEC
4	22CY502	Cloud Security	3/1/0	4	4	50/50	PCC
5	22CYXXX	Professional Elective – I	3/0/0 (or) 0/0/6	3	3	60/40 (or) 40/60	PEC
6	22CYXXX	Professional Elective – II	3/0/0	3	3	50/50	PEC
7	22AD405	Python for Data Science Laboratory	0/0/4	4	2	40/60	PCC
PROJECT WORK							
8	22CY503	Mini Project I	0/0/4	4	2	40/60	PW
			Total	**29**	**25**	**800**	

SEMESTER VI

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credits	Ext/Int	Category
1	22CYXXX	Emerging Elective – I	3/1/0	4	4	60/40	EEC
2	22IT701	Computational Biology	3/0/0	3	3	60/40	ESC
3	22CY601	Hacker Techniques Tools and Incident Handling	3/1/0	4	4	50/50	PCC
4	22CY602	Security Policies and Implementation	3/1/0	4	4	50/50	PCC
5	22CYXX	Professional Elective – III	3/0/0 (or) 0/0/6	5	3	60/40 (or) 40/60	PEC
6	22CYXX	Professional Elective – IV	3/0/0	3	3	50/50	PEC
			Total	26	21	600	

SEMESTER VII

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credits	Ext/Int	Category
1	22CYXXX	Professional Elective – V	3/1/0	4	4	60/40	PEC
2	22CYXXX	Professional Elective – VI	3/1/0	4	4	60/40	PEC
3	22CYXXX	Open Elective – II	3/1/0	4	4	60/40	OEC
4	22CYXXX	Emerging Elective – II	3/1/0	4	4	60/40	EEC
5	22CD401	Algorithms of Internet	3/0/2	5	4	50/50	PCC
6	22EES01	Employability Enhancement Skills	0/0/2	2	2	50/50	EES
			Total	19	22	600	

SEMESTER VIII

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credits	Ext/Int	Category
PROJECT WORK							
1	22CY801	Project Work Phase I	0/0/24	24	12	40/60	PW
			Total	24	12	100	

Humanities and Management Courses (8 credits)

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
1	22EN101	Technical Communication Skills	2/0/2	4	3	50/50	HSMC
2	22GE201	Universal Human Values	3/0/0	3	3	60/40	HSMC
3	22TA101	Heritage of Tamils	1/0/0	1	1	60/40	HSMC
4	22TA201	Tamils and Technology	1/0/0	1	1	60/40	HSMC

Basic Science Courses (20 credits)

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
1	22MA103	Linear Algebra and Calculus	3/1/0	4	4	60/40	BSC
2	22CH101	Engineering Chemistry	3/0/2	5	4	50/50	BSC
3	22MA203	Mathematical Foundations of Computer Science	3/1/0	4	4	60/40	BSC
4	22PH201	Physics	3/0/2	5	4	50/50	BSC
5	22MA302	Random variable and Statistics	3/1/0	4	4	60/40	BSC

Engineering Science Courses (11 credits)

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
1	22EE111	Basics of Electrical and Electronics Engineering	2/1/0	3	3	60/40	ESC
2	22AD201	Java Programming	3/0/2	5	4	50/50	ESC
3	22EE111	Basics of Electrical and Electronics Engineering Laboratory	0/0/2	2	1	40/60	ESC
4	22IT701	Computational Biology	3/0/0	3	3	60/40	ESC

Professional Core Courses (78 credits)

S No.	Course Code	Course	L/T/P	Contact hrs/week	Credit	Ext/Int	Category
1	22IT101	Application Development Practices	3/0/2	5	4	50/50	PCC
2	22CS101	Problem Solving using C++	3/0/2	5	4	50/50	PCC
3	22CS201	Data Structures and Algorithms	3/0/2	5	4	50/50	PCC
4	22IT201	Database Management Systems	3/0/2	5	4	50/50	PCC
5	22CY301	Cyber Security Essentials	3/0/0	3	3	60/40	PCC
4	22IT301	Web Technology using React	1/0/4	5	3	50/50	PCC

5	22CS301	Advanced Java Programming	1/0/4	5	3	50/50	PCC
6	22AD301	Design and analysis of algorithms	1/0/4	5	3	50/50	PCC
7	22CY301	Cyber Law and Digital Forensics	3/1/0	4	4	60/40	PCC
8	22CS402	Web Frameworks	1/0/4	5	3	50/50	PCC
9	22AD401	Cloud Computing	1/0/4	5	3	50/50	PCC
10	22IT402	Software Testing	1/0/4	5	3	50/50	PCC
11	22CY402	Access Control and Identity management	3/0/2	5	4	50/50	PCC
12	22CY403	Auditing IT Infrastructure for Compliance	3/0/2	5	4	50/50	PCC
13	22CY401	Ethical Hacking	3/1/0	4	4	60/40	PCC
14	22CY502	Cloud Security	3/1/0	4	4	60/40	PCC
15	22AD403	Python for Data Science	3/0/0	3	3	60/40	PCC
16	22CY501	Internet Security	3/1/0	4	4	60/40	PCC
17	22AD405	Python for Data Science Laboratory	0/0/3	3	2	40/60	PCC
18	22CY601	Hacker Techniques Tools and Incident Handling	3/0/2	5	4	50/50	PCC
19	22CY602	Security Policies and Implementation	3/0/2	5	4	50/50	PCC
20	22CD401	Algorithms of Internet	3/0/2	5	4	50/50	PCC

Professional Elective Courses

S.No.	Course Code	Course	L	T	P	Credit	Ext/Int
Professional Elective – I							
1.	22CY901	Security in Wireless Sensor Networks	3	0	0	3	60/40
2.	22CY902	Artificial Intelligence in Cyber Forensics	3	0	0	3	60/40
3.	22CY903	Malware Analysis	3	0	0	3	60/40
4.	22AD901	App Development	0	0	6	3	40/60
Professional Elective – II							
5.	22CY904	Data Privacy and Security	3	0	0	3	60/40
6.	22CY905	Biometric Security	3	0	0	3	60/40
7.	22CY906	Network Security and Penetration Testing	3	0	0	3	60/40
Professional Elective – III							
8.	22CY907	Managing IT Security and Risk	3	0	0	3	60/40
9.	22CY908	Cyber Crime and Digital Forensics	3	0	0	3	60/40
10.	22AD004	Data Visualization using R	3	0	0	3	60/40
11.	22IT902	Cloud Architecture	0	0	6	3	40/60
Professional Elective – IV							
12.	22CY909	Emerging Cyber security Risks	3	0	0	3	60/40
13.	22CY910	Optimization Techniques	3	0	0	3	60/40
14.	22CY911	Mobile Device Forensics	3	0	0	3	60/40
Professional Elective – V							
15.	22CY912	Offensive Security	3	1	0	4	60/40
16.	22CY913	Cyber Threat Intelligence and Analytics	3	1	0	4	60/40
17.	22AD501	Big Data Analytics	3	1	0	4	60/40
Professional Elective – VI							
18.	22CY914	Crypto currency Engineering and Design	3	1	0	4	60/40
19.	22CY915	Internet of Things Security	3	1	0	4	60/40
20.	22CY916	Smart Grid Cyber Security	3	1	0	4	60/40

Open Elective Courses

S.No.	Course Code	Course	L	T	P	Credit	Ext/Int
1.	22CY111	Cyber Security Fundamentals	3	1	0	4	60/40
2.	22CY112	Cryptography – Tools and Techniques	3	1	0	4	60/40
3.	22CY113	Cybersecurity Auditing and Assurance	3	1	0	4	60/40
4.	22CY114	Web security	3	1	0	4	60/40
5.	22CY115	Operating System Security	3	1	0	4	60/40
6.	22CY116	Security Governance, Risk and compliance	3	1	0	4	60/40

Emerging Elective Courses

Emerging Elective Course - Stream 1							
S.No.	Course Code	Course	L	T	P	Credit	Ext/Int
1	22CY007	Application Security	3	1	0	4	60/40
2	22CY008	Dependable Computing	3	1	0	4	60/40
3	22CY009	Security and Privacy of Cyber Physical Systems	3	1	0	4	60/40
Emerging Elective Course - Stream 2							
4	22CY010	LDAP Directory Services	3	1	0	4	60/40
5	22CY011	Proactive Security Tools and Techniques	3	1	0	4	60/40
6	22CY012	Jenkins and Kubernetes	3	1	0	4	60/40

Value Added Courses

S.No.	Course Code	Course	Credit	Category
1.	22VA140	Kali Linux	1	VAC
2.	22VA141	Wireshark	1	VAC
3.	22VA130	Effective Communication Skills	2	VAC

Mandatory Courses

S.No.	Course Code	Course Title	Category
1	22MC101	Induction Programme	MC
2	22MC102	Environmental Sciences	MC
3	22MC103	Soft Skills	MC
4	22MC104	Management Organizational Behaviour	MC
5	22MC105	General Aptitude	MC
6	22MC106	Life Skills and Ethics	MC
7	22MC107	Stress Management	MC
8	22MC108	Constitution of India	MC
9	22MC109	Essence of Indian Traditional Knowledge	MC

SCHEME OF CREDIT DISTRIBUTION – SUMMARY

S. No	Stream	Credits/Semester								Credits	AICTE Norms
		I	II	III	IV	V	VI	VII	VIII		
1.	Humanities and Management Courses(HSMC)	3	4	1						**8**	**16**
2.	Basic Science Courses (BSC)	8	8	4						**20**	**23**
3.	Engineering Science Courses (ESC)	4	4				3			**11**	**29**
4.	Professional Core Courses (PCC)	8	8	16	21	13	8	4		**78**	**59**
5.	Professional Elective Courses (PEC)					6	6	8		**20**	**12**
6.	Open Elective Courses (OEC)					4		4		**8**	**9**
7.	Emerging Elective Courses (EEC)						4	4		**8**	**-**
8.	Project Work(PW)					2			12	**14**	**15**
9.	Employability Enhancement Courses (EES)							2		**2**	**-**
10.	Mandatory Courses (MC)									**Non credit**	**-**
	Total	**23**	**24**	**21**	**21**	**25**	**21**	**22**	**12**	**169**	
	AICTE	**17.5**	**20.5**	**23**	**22**	**21**	**22**	**18**	**15**		**163**