KSR College of Engineering

AN AUTONOMOUS INSTITUTION

NAAC ACCREDITED A++ | NBA ACCREDITED PROGRAMMES

25 Years KSRCE 2001 – 2026 Celebrating Academic Excellence

B.E. - SAFETY AND FIRE ENGINEERING

REGULATIONS 2024

(Academic Year 2025-26 Onwards)

Curriculum & Syllabus
Semester I and II

K.S.R. COLLEGE OF ENGINEERING: TIRUCHENGODE - 637 215
(Autonomous)
DEPARTMENT OF SAFETY AND FIRE ENGINEERING
B.E. - Safety and Fire Engineering (REGULATIONS 2024)

Vision of the Institution

IV	To become a globally renowned institution in Engineering and Management, committed to providing holistic education that fosters research, innovation and sustainable development.

Mission of the Institution

IM 1 Deliver value-based quality education through modern pedagogy and experiential learning.

IM 2 Enrich Engineering and Managerial Skills through cutting-edge laboratories to meet evolving global demands.

IM 3 Empower research and innovation by integrating collaboration, social responsibility, and commitment to sustainable development.

Vision of the Department

DV	To produce recognized Safety and Fire Engineers with pioneering innovative solutions to enhance safety and promote sustainable development.

Mission of the Department

DM 1 Impart quality education through student-centered teaching approaches.

DM 2 Equip students with the cutting-edge knowledge and skills to address the emerging safety challenges.

DM 3 Enhance research and innovation in Safety and Fire Engineering, fostering a culture of safety and sustainability.

Program Educational Objectives (PEOs) B.E. - Safety and Fire Engineering

The graduates of the Programme will be able to	
PEO 1	**Core Competency:** Leverage engineering expertise in fire safety, occupational health, and risk management to provide sustainable solutions for Potential hazards.
PEO 2	**Professionalism:** Graduates will demonstrate leadership, ethics and teamwork in managing emergency response systems and workplace safety.
PEO 3	**Career Development:** Graduates will undertake higher studies, research and professional development to meet industry demands in Fire and Safety Engineering.

Program Outcomes (POs)	
PO1	**Engineering Knowledge:** Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.
PO2	**Problem Analysis:** Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1to WK4)
PO3	**Design/Development of Solutions:** Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)
PO4	**Conduct Investigations of Complex Problems:** Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).
PO5	**Engineering Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6).
PO6	**The Engineer and The World:** Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).
PO7	**Ethics:** Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)
PO8	**Individual and Collaborative Team work**: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.
PO9	**Communication:** Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences.
PO10	**Project Management and Finance:** Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
PO11	**Life-Long Learning:** Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)
Program Specific Outcomes (PSOs)	
PSO1	**Occupational Health and Industrial Safety:** Identify, assess, and control workplace hazards using risk analysis, safety audit techniques, and legal compliance frameworks to ensure occupational health and safety in various industries.
PSO2	**Fire Protection Systems Design:** Apply principles of fire dynamics, combustion and implement effective fire protection and suppression systems in residential, commercial, and industrial environments.

	K.S.R. COLLEGE OF ENGINEERING Autonomous Approved by AICTE and Affiliated to Anna University, Chennai Accredited by NAAC ('A++' Grade)	Curriculum UG R - 2024
Department	**Department of Safety and Fire Engineering**	
Programme	**B.E. Safety and Fire Engineering**	

SEMESTER I

S.No.	Course Code	Course Title	Category	Periods / Week					Credit	Max. Marks		
				L	T	P	SL	Tot		CA	ES	Tot
Induction Programme			-	-	-	-	-	-	-	-	-	-
THEORY COURSES												
1.	24ENT19	Professional Communication	HSMC	45	0	0	45	90	3	40	60	100
2.	24MET16	Engineering Drawing	PCC	60	0	0	60	120	4	40	60	100
3.	24SFT11	Basics of Safety & Mechanical Engineering	PCC	45	0	0	45	90	3	40	60	100
4.	24GET19	தமிழர் மரபு / Heritage of Tamils	HSMC	15	0	0	15	30	1	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT												
5.	24MAI19	Matrices and Calculus	BSC	45	0	30	45	120	4	50	50	100
6.	24PHI06	Applied Physics	BSC	45	0	30	45	120	4	50	50	100
LABORATORY COURSES												
7.	24SFP11	Computer Aided Graphics & Drawing Laboratory	ESC	0	0	30	0	30	1	60	40	100
8.	24GEP17	Manufacturing Practices Laboratory	ESC	0	0	30	0	30	1	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE												
9.	24SDP19	Soft Skills Development - I	EEC	0	0	30	0	30	1	60	40	100
			TOTAL	**255**	**0**	**150**	**255**	**660**	**22**	**900**		

SEMESTER II												
S.No.	Course Code	Course Title	Category	Periods / Week					Credit	Max. Marks		
				L	T	P	SL	Tot		CA	ES	Tot
THEORY COURSES												
1.	24MET26	Design Thinking	PCC	30	0	0	30	60	2	40	60	100
2.	24EET06	Basics of Electrical and Electronics Engineering	ESC	45	0	0	45	90	3	40	60	100
3.	24GET29	தமிழரும் தொழில் நுடபமும் / Tamils and Technology	HSMC	15	0	0	15	30	1	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT												
4.	24CSI29	Python Programming	ESC	15	0	90	15	120	4	50	50	100
5.	24MAI29	Probability and Statistics	BSC	45	0	30	45	120	4	50	50	100
6.	24CHI07	Applied Chemistry	BSC	45	0	30	45	120	4	50	50	100
LABORATORY COURSES												
7.	24ENP29	Professional Communication Laboratory	HSMC	0	0	30	0	30	1	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE												
8.	24SDP29	Soft Skills Development -II	EEC	0	0	30	0	30	1	60	40	100
MANDATORY COURSE												
9.	24MCP09	Mandatory Course - I	MC	0	0	30	0	30	0	-	-	-
			TOTAL	**195**	**0**	**240**	**195**	**630**	**20**	**900**		

SEMESTER III												
S.No.	Course Code	Course Title	Category	Periods / Week					Credit	Max. Marks		
				L	T	P	SL	Tot		CA	ES	Tot
THEORY COURSES												
1.	24MAT36	Optimization Techniques	BSC	45	15	0	60	120	4	40	60	100
2.	24SFT31	Principles of Safety Management	PCC	45	0	0	45	90	3	40	60	100
3.	24SFT32	Safety in Engineering Industry	PCC	45	0	0	45	90	3	40	60	100
4.	24SFT33	Fundamentals of Industrial Safety	PCC	45	0	0	45	90	3	40	60	100
5.	24SFT36	Manufacturing Processes	PCC	45	0	0	45	90	3	40	60	100
6.	24MET37	Fluid Mechanics and Machinery	PCC	45	0	0	45	90	3	40	60	100
LABORATORY COURSES												
7.	24SFP36	Manufacturing Processes Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
8.	24MEP36	Fluid Mechanics and Machinery Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
9.	24MEP37	Design Studio - I	ESC	0	0	30	0	30	1	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE												
10.	24SDP39	Soft Skills Development -III	EEC	0	0	30	0	30	1	60	40	100
			TOTAL	**270**	**15**	**150**	**285**	**720**	**24**	**1000**		

SEMESTER IV												
S.No.	Course Code	Course Title	Category	Periods / Week					Credit	Max. Marks		
				L	T	P	SL	Tot		CA	ES	Tot
THEORY COURSES												
1.	24MAT46	Numerical and computational Techniques	BSC	45	15	0	60	120	4	40	60	100
2.	24MET46	Strength of Materials	PCC	45	0	0	45	90	3	40	60	100
3.	24SFT41	Safety in Construction	PCC	45	0	0	45	90	3	40	60	100
4.	24SFT42	Safety in Rail and Road Transport	PCC	45	0	0	45	90	3	40	60	100
5.	24SFT43	Chemical Process Safety	PCC	45	0	0	45	90	3	40	60	100
6.	24GET49	Universal Human Values	HSMC	45	0	0	45	90	3	40	60	100
LABORATORY COURSES												
7.	24MEP46	Strength of Materials Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
8.	24SFP41	Safety Engineering Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
9.	24MEP47	Design Studio - II	ESC	0	0	30	0	30	1	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE												
10.	24SDP49	Soft Skills Development -IV	EEC	0	0	30	0	30	1	60	40	100
			TOTAL	**270**	**15**	**150**	**285**	**720**	**24**	**1000**		

SEMESTER V												
S.No.	Course Code	Course Title	Category	Periods / Week					Credit	Max. Marks		
				L	T	P	SL	Tot		CA	ES	Tot
THEORY COURSES												
1.	24SFT51	Planning and Design of Fire Protection Systems	PCC	45	0	0	45	90	3	40	60	100
2.	24SFT52	Occupational Health and First Aid	PCC	45	0	0	45	90	3	40	60	100
3.	24SFT53	Fire Engineering Fundamentals	PCC	45	0	0	45	90	3	40	60	100
4.		Professional Elective – I	PEC	45	0	0	45	90	3	40	60	100
5.		Professional Elective – II	PEC	45	0	0	45	90	3	40	60	100
6.		Open Elective – I	OEC	45	0	0	45	90	3	40	60	100
LABORATORY COURSES												
7.	24SFP51	Occupational Health and First Aid Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
8.	24SFP52	Fire Engineering Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE												
9.	24SFP53	Internship – I *	EEC	0	0	30	0	30	1	100	-	100
MANDATORY COURSE												
10.		Mandatory Course - II	MC	30	0	0	0	30	0	100	-	100
			TOTAL	**300**	**0**	**120**	**270**	**690**	**22**	**1000**		

Internship – I *- The Students Should Undergo Internship during the IV Semester Summer Vacation.

SEMESTER VI												
S.No.	Course Code	Course Title	Category	Periods / Week					Credit	Max. Marks		
				L	T	P	SL	Tot		CA	ES	Tot
THEORY COURSES												
1.	24SFT61	Legal Aspects of Safety, Health & Environment	PCC	45	0	0	45	90	3	40	60	100
2.	24SFT62	Environmental Safety	PCC	45	0	0	45	90	3	40	60	100
3.	24SFT63	Structural Fire Safety	PCC	45	0	0	45	90	3	40	60	100
4.		Professional Elective – III	PEC	45	0	0	45	90	3	40	60	100
5.		Professional Elective – IV	PEC	45	0	0	45	90	3	40	60	100
6.		Open Elective – II	OEC	45	0	0	45	90	3	40	60	100
LABORATORY COURSES												
7.	24SFP61	Fire Safety Training Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
8.	24SFP62	Environmental Safety Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
EMPLOYABILITY ENHANCEMENT COURSES												
9.	24SFP63	Mini Project	EEC	0	0	60	0	60	2	60	40	100
MANDATORY COURSE												
10.		Mandatory Course - III	MC	30	0	0	0	30	0	100	-	100
			TOTAL	**300**	**0**	**120**	**270**	**690**	**23**	**1000**		

SEMESTER VII												
S.No.	Course Code	Course Title	Category	Periods / Week					Credit	Max. Marks		
				L	T	P	SL	Tot		CA	ES	Tot
THEORY COURSES												
1.	24SFT71	Principles of Industrial Management	PCC	45	0	0	45	90	3	40	60	100
2.	24GET79	Professional Ethics	HSMC	45	0	0	45	90	3	40	60	100
3.		Management Elective	HSMC	45	0	0	45	90	3	40	60	100
4.		Professional Elective – V	PEC	45	0	0	45	90	3	40	60	100
5.		Professional Elective – VI	PEC	45	0	0	45	90	3	40	60	100
6.		Open Elective – III	OEC	45	0	0	45	90	3	40	60	100
LABORATORY COURSES												
7.	24SFP71	Emergency Life Support Laboratory	PCC	0	0	30	0	30	1	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE												
8.	24SFP72	Project Work Phase - I	EEC	0	0	60	0	60	2	60	40	100
9.	24SFP73	Internship – II*	EEC	0	0	30	0	30	1	100	-	100
		TOTAL		**270**	**0**	**120**	**270**	**660**	**22**	**900**		

Internship – II*- The Students Should Undergo Internship during the VI Semester Summer Vacation.

SEMESTER VIII												
S.No.	Course Code	Course Title	Category	Periods / Week					Credit	Max. Marks		
				L	T	P	SL	Tot		CA	ES	Tot
EMPLOYABILITY ENHANCEMENT COURSE												
1.	24SFP81	Project Work Phase – II	EEC	0	0	240	0	240	8	60	40	100
		TOTAL		**0**	**0**	**240**	**0**	**240**	8	**100**		
								TOTAL CREDITS		**165**		

TOTAL NUMBER OF CREDITS TO BE EARNED FOR AWARD OF THE DEGREE = 165

Note:HSMC- Humanities and Social Sciences including Management courses, BSC - Basic Science Courses, ESC - Engineering Science Courses, PCC - Professional core courses, PEC- Professional Elective courses, OEC - Open Elective courses, EEC – Employability Enhancement Courses &MC- Mandatory courses.