ACADEMIC CURRICULA

UNDERGRADUATE/ INTEGRATED POST GRADUATE DEGREE PROGRAMMES

(With exit option of Diploma)

(Choice Based Flexible Credit System)

Regulations 2021

Volume – 1

(Revised on July 2024)

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

(Deemed to be University u/s 3 of UGC Act, 1956)

Kattankulathur, Chengalpattu District 603203,

Tamil Nadu, India

37. B.Tech. in Electric Vehicle Technology

37. (a) Mission of the Department

Mission Stmt – 1	*To educate the student to become better practicing engineers to meet global excellence.*
Mission Stmt – 2	*To provide better environment through latest developments in electrical engineering involving problem solving, design, practice and training.*
Mission Stmt – 3	*To motivate the graduates to become a good leader, designer and researcher through industry-oriented trainings with social and ethical responsibilities.*

37. (b) Program Educational Objectives (PEO)

PEO – 1	*Graduates have the competence to proficiently apply their acquired knowledge in mathematics, basic sciences and professional courses to effectively address the complex challenges encountered in the real world.*
PEO – 2	*Graduates are equipped with necessary skills to continuously learn and adapt themselves to the ever-changing technology.*
PEO – 3	*Graduates are better employable and achieve success in the field of electric vehicle technology.*
PEO – 4	*Graduates will demonstrate strong communication skills, adeptness in collaborative teamwork and a deep appreciation for lifelong learning.*

37. (c) Mission of the Department to Program Educational Objectives (PEO) Mapping

	Mission Stmt. - 1	Mission Stmt. - 2	Mission Stmt. - 3
PEO - 1	*3*	*2*	*1*
PEO - 2	*2*	*3*	*1*
PEO - 3	*2*	*2*	*1*
PEO - 4	*1*	*1*	*3*

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

37. (d) Mapping Program Educational Objectives (PEO) to Program Outcomes (PO)

	Program Outcomes (PO)												Program Specific Outcomes (PSO)		
	1	2	3	4	5	6	7	8	9	10	11	12			
	Engineering Knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern Tool Usage	The engineer and society	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO-1	PSO-2	PSO-3
PEO - 1	*3*	*3*	*3*	*1*	-	-	*1*	-	-	-	-	-	*3*	-	-
PEO - 2	-	-	-	*3*	*3*	-	*2*	-	-	-	-	*3*	-	*3*	-
PEO - 3	-	*3*	*3*	-	*2*	*3*	-	*3*	*2*	-	*2*	-	*2*	*2*	-
PEO - 4	-	-	-	-	-	-	-	-	*3*	*3*	*3*	-	-	-	*3*

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

PSO – Program Specific Outcomes (PSO)

PSO - 1	*Apply principles of engineering and practical skills to design, develop and validate real time electric vehicle system*
PSO - 2	*Ability to gain knowledge and adapt to the constantly evolving technological advancements through engaging in Multidisciplinary activities.*
PSO - 3	*Acquire knowledge of professional values and ethics for promoting sustainable development in the field of electric vehicle technology.*

37. (e) Program Structure: B.Tech. in Electric Vehicle Technology

Humanities & Social Sciences including Management Courses (H)

Course Code	Course Title	Hours / Week L	T	P	C
21LEH101T	Communicative English	2	1	0	3
21LEH102T	Chinese	2	1	0	3
21LEH103T	French				
21LEH104T	German				
21LEH105T	Japanese				
21LEH106T	Korean				
21LEH107T	Spanish				
21LEH108T	Russian				
21GNH101J	Philosophy of Engineering	1	0	2	2
21PDH209T [1]	Social Engineering	2	0	0	2
21GNH401T	Behavioral Psychology	2	1	0	3
				Total Credits	**13**

Engineering Science Courses (S)

Course Code	Course Title	Hours / Week L	T	P	C
21MES101L [1]	Basic Civil and Mechanical Workshop	0	0	4	2
21MES102L [1]	Engineering Graphics and Design	0	0	4	2
21EES101T	Electrical and Electronics Engineering	3	1	0	4
21CSS101J	Programming for Problem Solving	3	0	2	4
21MES101T	Engineering Mechanics	3	1	0	4
21DCS201P [1]	Design Thinking and Methodology	1	2	0	3
21CSS303T	Data Science	2	0	0	2
				Total Credits	**21**

Professional Core Courses (C)

Course Code	Course Title	Hours / Week L	T	P	C
21CSC206T	Artificial Intelligence	2	1	0	3
21EVC201J	Electromechanical Energy Conversion	2	0	2	3
21EVC202J	Analog and Digital Electronics	3	0	2	4
21EVC203T	Vehicular Sensor Actuators and Controls	3	0	0	3
21EVC204T	Automotive Engineering Systems	3	0	0	3
21EVC205J	Power Electronics	2	0	2	3
21EVC206T	Electric Vehicle Architecture	3	0	0	3
21EVC207T	Embedded System and Communication Protocols	3	0	0	3
21EVC208J	Electric Vehicle Design	3	0	2	4
21EVC301J	Kinematics and Dynamics of Automobile	3	0	2	4
21EVC302J	Electrical Drives and Control	2	0	2	3
21EVC303T	Electric Vehicle Charging Technology	3	0	0	3
21EVC304J	Autonomous and Connected Vehicles	3	0	2	4
21EVC305J	Vehicle Integration and Testing	2	0	2	3
				Total Credits	**46**

Open Elective Courses (O)
Any 3 courses)

Course Code	Course Title	Hours / Week L	T	P	C
21EEO301T	E-mobility	3	0	0	3
21EEO302T	Wearable Technology	3	0	0	3
21EEO303T	E-waste Management	3	0	0	3
21EEO304T	Energy Efficient Practices	3	0	0	3
21EEO305T	Surveillance Technology	3	0	0	3
21EEO306T	Sustainable Development Practices	3	0	0	3
21EEO307T	Clean and Green Energy	3	0	0	3
21EEO308T	Smart Cities and Communities	3	0	0	3
21EEO309T	Electrical Trading	3	0	0	3
21EEO310T	Unmanned Aerial Vehicle	3	0	0	3
				Total Credits	**09**

Basic Science Courses (B)

Course Code	Course Title	Hours / Week L	T	P	C
21PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5
21CYB101J	Chemistry	3	1	2	5
21MAB101T	Calculus and Linear Algebra	3	1	0	4
21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
21MAB209T	Transforms and Computational Techniques	3	1	0	4
21MAB301T	Probability and Statistics	3	1	0	4
21BTB103T	Biology	2	0	0	2
				Total Credits	**28**

Project Work, Seminar, Internship in Industry / Higher Technical Institutions (P)

Course Code	Course Title	Hours / Week L	T	P	C
21GNP301L [1]	Community Connect	0	0	2	1
21EVP302L [1]	Project	0	0	6	3
21EVP303T [1]	MOOC	3	0	0	
21EVP401L	Major Project	0	0	30	15
21EVP402L	Major Project	0	0	20	10
21EVP403L	Internship#	0	0	10	5
				Total Credits	**19**

Non Credit Courses (M)

Course Code	Course Title	Hours / Week L	T	P	C
21PDM101L [1]	Professional Skills and Practices	0	0	2	0
21PDM102L [1]	General Aptitude	0	0	2	
21PDM201L [1]	Verbal Reasoning	0	0	2	
21PDM202L [1]	Critical and Creative Thinking Skills	0	0	2	
21PDM301L [1]	Analytical and Logical Thinking Skills	0	0	2	
21PDM302L [1]	Employability Skills and Practices	0	0	2	
21CYM101T [1]	Environmental Science	1	0	0	0
21LEM101T [1]	Constitution of India	1	0	0	0
21LEM102T [1]	Universal Human Values – Introduction	1	0	0	0
21LEM201T [1]	Professional Ethics	1	0	0	0
21LEM202T [1]	Universal Human Values-II: Understanding Harmony and Ethical Human Conduct	2	1	0	3
21LEM301T [1]	Indian Art Form	1	0	0	0
21LEM302T [1]	Indian Traditional Knowledge	1	0	0	0
21GNM101L [1]	Physical and Mental Health using Yoga	0	0	2	0
21GNM102L [1]	National Service Scheme				
21GNM103L [1]	National Cadet Corps				
21GNM104L [1]	National Sports Organization				
				Total Credits	**03**

Professional Elective Courses (E) *(Any 8 courses)*					
Course Code	Course Title	Hours / Week			
		L	T	P	C
21EVE301T	*Advanced Energy Sources*	*3*	*0*	*0*	*3*
21EVE302J	*Vehicle Electronic Systems*	*2*	*0*	*2*	*3*
21EVE303T	*Battery Technologies*	*3*	*0*	*0*	*3*
21EVE304T	*Techno-economic Analysis of Electric Vehicles*	*3*	*0*	*0*	*3*
21EVE305T	*Automotive Materials and Manufacturing Processes*	*3*	*0*	*0*	*3*
21EVE306T	*Battery Management Systems*	*3*	*0*	*0*	*3*
21EVE307T	*Advanced Power Electronics*	*3*	*0*	*0*	*3*
21EVE308J	*Electric Vehicle Powertrain*	*2*	*0*	*2*	*3*
21EVE309J	*Energy Storage Systems for Electric Vehicle*	*2*	*0*	*2*	*3*
21EVE401T	*Fuel Cell Electric Vehicles and Hydrogen Technology*	*3*	*0*	*0*	*3*
21EVE402T	*Electric Vehicles Thermal Design and Management*	*3*	*0*	*0*	*3*
21EVE403T	*Vehicle Troubleshooting and Maintenance*	*3*	*0*	*0*	*3*

Professional Elective Courses (E)					
Course Code	Course Title	Hours / Week			
		L	T	P	C
21EVE404T	*EV Product Development Processes*	*3*	*0*	*0*	*3*
21EVE405T	*Trends in Vehicle Styling and Ergonomics*	*3*	*0*	*0*	*3*
21EVE406T	*EV Regulations and Policy Framework*	*3*	*0*	*0*	*3*
21EVE407T	*e-Mobility Ecosystem and Deployment Practices*	*3*	*0*	*0*	*3*
21EVE408P [1]	*Electric Vehicles Testing and Certification*	*1*	*0*	*4*	*3*
21EVE409T	*Automotive Interfaces, Fault Diagnostics and Security*	*3*	*0*	*0*	*3*
21EVE410T	*Industrial Automation and IoT*	*3*	*0*	*0*	*3*
21EVE411T	*Machine Vision*	*3*	*0*	*0*	*3*
21EVE412T	*Machine Design and Mechanics*	*3*	*0*	*0*	*3*
21EVE413T	*Hyperloop Technology*	*3*	*0*	*0*	*3*
21EVE414T	*Power systems and Microgrid*	*3*	*0*	*0*	*3*
21EVE415T	*Electric Vehicle Safety and Practices*	*3*	*0*	*0*	*3*
				Total Credits	**24**

37. (f) Programme Articulation: B.Tech. in Electric Vehicle Technology

Course Code	Course Name	Program Outcomes (PO)												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
		Engineering Knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern Tool Usage	The engineer and society	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO-1	PSO-2	PSO-3
21EVC201J	Electromechanical Energy Conversion	3	3	-	-	1	-	-	-	-	-	-	-	1.4	-	-
21EVC202J	Analog and Digital Electronics	3	3	2	-	1	-	-	-	-	-	-	-	1.25	-	-
21EVC203T	Vehicular Sensor Actuators and Controls	3	2.4	3	2	-	-	-	-	-	-	-	-	2	2	-
21EVC204T	Automotive Engineering Systems	3	1.4	-	-	-	-	-	-	-	-	-	-	1	-	-
21EVC205J	Power Electronics	3	2.6	3	-	1.8	-	-	-	-	-	-	2	3	-	-
21EVC206T	Electric Vehicle Architecture	3	2.75	2	-	-	-	-	-	-	-	-	-	2	1	-
21EVC207T	Embedded System and Communication Protocols	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-
21EVC208J	Electric Vehicle Design	3	3	3	-	-	-	-	-	-	-	-	-	2	1	-
21EVC301J	Kinematics and Dynamics of Automobile	3	3	-	-	-	-	-	-	-	-	-	-	1	-	-
21EVC302J	Electrical Drives and Control	3	1.4	-	-	2	-	-	-	-	-	-	-	2	-	-
21EVC303T	Electric Vehicle Charging Technology	3	2	-	-	-	-	2	1.67	-	-	-	-	2	1	1.667
21EVC304J	Autonomous and Connected Vehicles	3	1	-	-	2	-	-	-	-	-	-	-	2	-	-
21EVC305J	Vehicle Integration and Testing	3	3	-	-	-	-	-	2	-	-	-	-	2	-	2
21EVE301T	Advanced Energy Sources	3	-	-	-	-	-	3	-	-	-	-	-	-	-	2
21EVE302J	Vehicle Electronics Systems	3	1.5	-	-	-	-	-	2	-	-	-	-	1	-	-
21EVE303T	Battery Technologies	3	-	-	-	2	-	-	1.67	-	-	-	-	1.5	1	2
21EVE304T	Techno-Economic Analysis of Electric Vehicle	3	2	-	-	-	-	-	2	-	-	1	-	1	1	-
21EVE305T	Automotive Materials and Manufacturing Processes	3	2	-	-	2	-	-	-	-	-	-	-	1	1	-
21EVE306T	Battery Management Systems	3	2	-	-	2	-	-	-	-	-	-	-	-	-	-
21EVE307T	Advanced Power Electronics	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
21EVE308J	Electric Vehicle Powertrain	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
21EVE309J	Energy Storage Systems for Electric Vehicle	3	1	-	-	2	-	2	2	-	-	-	-	-	-	2
21EVE401T	Fuel Cell Electric Vehicles and Hydrogen Technology	3	1	-	-	2	-	2	2	-	-	-	-	1.667	-	2
21EVE402T	Electric Vehicles Thermal Design and Management	3	1.33	-	-	-	-	-	-	-	-	-	-	1	-	-
21EVE403T	Vehicle Troubleshooting and Maintenance	3	-	-	-	2.6	-	-	-	-	-	-	-	1	-	-
21EVE404T	EV Product Development Processes	3	1.67	-	-	-	1	-	2	-	-	1	-	1.75	-	-
21EVE405T	Trends in Vehicle Styling and Ergonomics	3	1	-	-	1.67	-	-	1	-	-	-	1	-	-	-
21EVE406T	EV Regulations and Policy Framework	3	-	-	-	-	-	2	3	-	-	-	-	-	-	1
21EVE407T	e-Mobility Ecosystem and Deployment Practices	3	-	-	-	-	-	1	2.5	-	-	-	-	1	-	1.5
21EVE408P	Electric Vehicles Testing and Certification	3	3	3	3	3	3	3	3	3	3	3	2	3	3	1
21EVE409T	Automotive Interfaces, fault Diagnostics and Security	3	-	-	-	2	1	-	2	-	-	-	-	-	-	-
21EVE410T	Industrial Automation and IoT	3	-	-	-	2	-	-	2	-	-	-	-	-	-	-
21EVE411T	Machine Vision	3	-	-	-	2.4	-	-	-	-	-	-	-	2	-	1
21EVE412T	Machine design and Mechanics	3	3	-	-	-	-	-	-	-	-	-	-	1	-	-
21EVE413T	Hyperloop Technology	3	2	1	-	-	1	1	2	-	-	-	-	-	-	1
21EVE414T	Power systems and Microgrid	3	1.5	-	-	-	-	1	1	-	-	-	-	1	-	1.5
21EVE415T	Electric Vehicle Safety and Practices	3	-	-	-	-	-	-	3	-	-	-	-	-	-	-
21GNP301L	Community Connect	-	-	-	-	3		3	3	2	-	-	-	-	-	-
21EVP302L	Project	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
21EVP303T	MOOC	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-
21EVP401L	Major Project	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
21EVP402L	Major Project	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
21EVP403L	Internship#	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Programme Average															

37. (g) Implementation Plan: B.Tech. in Electric Vehicle Technology

Semester – I

Course Code	Course Title	Hours / Week L	T	P	C
21LEH101T	Communicative English	2	1	0	3
21MAB101T	Calculus and Linear Algebra	3	1	0	4
21PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5
21MES102L [1]	Engineering Graphics and Design	0	0	4	2
21EES101T	Electrical and Electronics Engineering	3	1	0	4
21CYM101T [1]	Environmental Science	1	0	0	0
21PDM101L [1]	Professional Skills and Practices	0	0	2	0
21LEM101T [1]	Constitution of India	1	0	0	0
				Total Credits	**18**

Semester – II

Course Code	Course Title	Hours / Week L	T	P	C
21LEH102T	Chinese	2	1	0	3
21LEH103T	French				
21LEH104T	German				
21LEH105T	Japanese				
21LEH106T	Korean				
21LEH107T	Spanish				
21LEH108T	Russian				
21GNH101J	Philosophy of Engineering	1	0	2	2
21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
21CYB101J	Chemistry	3	1	2	5
21MES101T	Engineering Mechanics	3	1	0	4
21CSS101J	Programming for Problem Solving	3	0	2	4
21BTB103T	Biology	2	0	0	2
21MES101L [1]	Basic Civil and Mechanical Workshop	0	0	4	2
21PDM102L [1]	General Aptitude	0	0	2	0
21GNM101L [1]	Physical and Mental Health using Yoga	0	0	2	0
21GNM102L [1]	National Service Scheme				
21GNM103L [1]	National Cadet Corps				
21GNM104L [1]	National Sports Organization				
				Total Credits	**26**

Semester – III

Course Code	Course Title	Hours / Week L	T	P	C
21MAB209T	Transforms and Computational Techniques	3	1	0	4
21PDH209T [1]	Social Engineering	2	0	0	2
21EVC201J	Electromechanical Energy Conversion	2	0	2	3
21EVC202J	Analog and Digital Electronics	3	0	2	4
21EVC203T	Vehicular Sensor Actuators and Controls	3	0	0	3
21EVC204T	Automotive Engineering Systems	3	0	0	3
21LEM201T [1]	Professional Ethics	1	0	0	0
21PDM201L [1]	Verbal Reasoning	0	0	2	0
21LEM202T [1]	Universal Human Values-II: Understanding Harmony and Ethical Human Conduct	2	1	0	3
				Total Credits	**22**

Semester – IV

Course Code	Course Title	Hours / Week L	T	P	C
21MAB301T	Probability and Statistics	3	1	0	4
21CSC206T	Artificial Intelligence	2	1	0	3
21EVC205J	Power Electronics	2	0	2	3
21EVC206T	Electric Vehicle Architecture	3	0	0	3
21EVC207T	Embedded System and Communication Protocols	3	0	0	3
21EVC208J	Electric Vehicle Design	3	0	2	4
21DCS201P [1]	Design Thinking and Methodology	1	2	0	3
21PDM202L [1]	Critical and Creative Thinking Skills	0	0	2	0
				Total Credits	**23**

Semester – V

Course Code	Course Title	Hours / Week L	T	P	C
21EVC301J	Kinematics and Dynamics of Automobile	3	0	2	4
21EVC302J	Electrical Drives and Control	2	0	2	3
21EVC303T	Electric Vehicle Charging Technology	3	0	0	3
E	Professional Elective – I				3
E	Professional Elective – II				3
O	Open Elective – I				3
21GNP301L [1]	Community Connect	0	0	2	1
21PDM301L [1]	Analytical and Logical Thinking Skills	0	0	2	0
21LEM301T [1]	Indian Art Form	1	0	0	0
				Total Credits	**20**

Semester – VI

Course Code	Course Title	Hours / Week L	T	P	C
21CSS303T	Data Science	2	0	0	2
21EVC304J	Autonomous and Connected Vehicles	3	0	2	4
21EVC305J	Vehicle Integration and Testing	2	0	2	3
E	Professional Elective – III				3
E	Professional Elective – IV				3
O	Open Elective – II				3
21EVP302L [1]	Project	0	0	6	3
21EVP303T [1]	MOOC	3	0	0	
21PDM302L [1]	Employability Skills and Practices	0	0	2	0
21LEM302T [1]	Indian Traditional Knowledge	1	0	0	0
				Total Credits	**21**

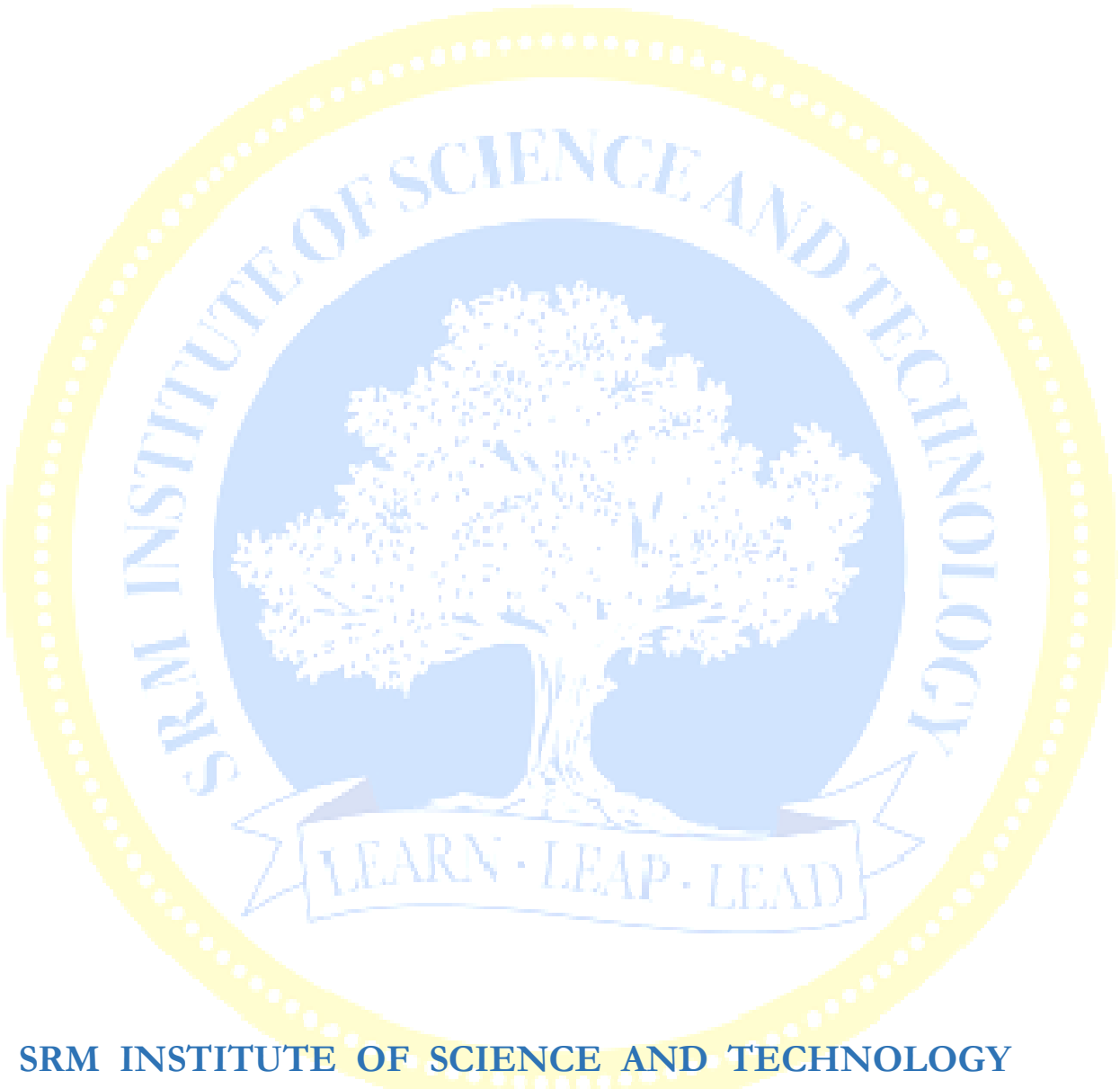
Semester – VII

Course Code	Course Title	Hours / Week L	T	P	C
21GNH401T	Behavioral Psychology	2	1	0	3
E	Professional Elective – V				3
E	Professional Elective – VI				3
E	Professional Elective – VII				3
E	Professional Elective – VIII				3
O	Open Elective – III	3	0	0	3
				Total Credits	**18**

Semester - VIII

Course Code	Course Title	Hours / Week L	T	P	C
21EVP401L	Major Project	0	0	30	15
21EVP402L	Major Project	0	0	20	10
21EVP403L	Internship#	0	0	10	5
				Total Credits	**15**

#Students have to register either 21EVP401L or 21EVP402L and 21EVP403L both in eighth semester



SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

(Deemed to be University u/s 3 of UGC Act, 1956)

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