



Sri SAI RAM INSTITUTE OF TECHNOLOGY

An Autonomous Institution | Affiliated to Anna University & Approved by AICTE, New Delhi
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Sai Leo Nagar, West Tambaram, Chennai - 600 044. www.sairamit.edu.in



1.1.1 Curricula developed and implemented have relevance to the local, national, regional and global developmental needs which are reflected in Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the various Programmes offered by the Institution.

S.No	PROGRAMME CODE	COURSE CODE	COURSE NAME
1.	104,105,106,114,118,205,243	20MGMC301	Constitution of India
2.	104,106,205	OCE551	Air Pollution And Control Engineering
3.	106,205	GE8071	Disaster Management
4.	205	OCY751	Waste Water Treatment
5.	105,205	GE8076	Professional Ethics in Engineering
6.	205	OCE751	Environmental and Social Impact Assessment
7.	105	GE8074	Human Rights
8.	104,106	GE8291	Environmental Science And Engineering

PRINCIPAL

PRINCIPAL

SRI SAIRAM INSTITUTE OF TECHNOLOGY
SAI LEO NAGAR, CHENNAI-600 044,

20MGMC301

CONSTITUTION OF INDIA

L T P C

SDG NO.4

2 0 0 0

OBJECTIVES:

- To know about Indian constitution
- To know about central government functionalities in India
- To know about state government functionalities in India
- To know about Constitution function
- To Know about Constitutional remedies

UNIT I : INTRODUCTION

6

Historical Background – Constituent Assembly of India – Philosophical foundations of the Indian Constitution – Preamble – Fundamental Rights – Directive Principles of State Policy – Fundamental Duties

UNIT II : STRUCTURE AND FUNCTION OF CENTRAL GOVERNMENT

6

Union Government – Structures of the Union Government and Functions – President – Vice President – Prime Minister – Cabinet – Parliament – Supreme Court of India.

UNIT III : STRUCTURE AND FUNCTION OF STATE GOVERNMENT

6

State Government – Structure and Functions – Governor – Chief Minister – Cabinet – State Legislature – Judicial System in States – High Courts and other Subordinate Courts

UNIT IV CONSTITUTION FUNCTIONS

6

Indian Federal System – Centre – State Relations – President's Rule – Constitutional Amendments – Constitutional Functionaries.

UNIT V CONSTITUTIONAL REMEDIES

6

Enforcement of fundamental rights - Power of parliament to modify the rights conferred by this part in their application to forces.

Total: 30 Periods

TEXT BOOKS

1. Durga Das Basu (2013), "Introduction to the Constitution of India", Prentice Hall of India, New Delhi.
2. R.C. Agarwal, (1997) "Indian Political System", S. Chand and Company, New Delhi.
3. M.V. Pyle (2019), "An Introduction to the Constitution of India, 5/e", Vikas Publishing, New Delhi.

REFERENCES:

1. Sharma, Brij Kishore, "Introduction to the Constitution of India", Prentice Hall of India, New Delhi.
2. U.R.Gahai, "Indian Political System", New Academic Publishing House, Jalandhar.



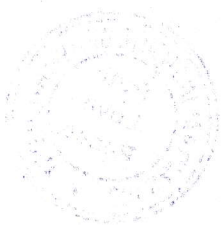
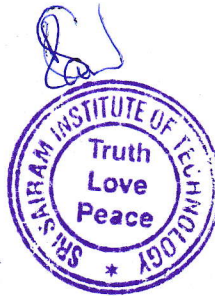
OUTCOMES

Upon completion of the course, the student should be able to

1. Explain the Constitution & Fundamental rights of citizens. (K2)
2. Discuss the structure, hierarchy and functions of Central Government. (K2)
3. Explain the functions of Supreme Court and Judiciary Systems in the state. (K2)
4. Discuss the structure, hierarchy and functions of State Government. (K2)
5. Recall the Centre-State relationship, constitutional amendments and functionaries (K1)
6. Discuss the remedies and rights available to India Citizens. (K2)

CO - PO, PSO MAPPING

	PO 1	PO 2	PO 3	PO 4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	1	1	-	-	-	-	-	-	-
CO2	-	-	-	-	-	1	1	-	-	-	-	-	-	-
CO3	-	-	-	-	-	1	1	-	-	-	-	-	-	-
CO4	-	-	-	-	-	1	1	-	-	-	-	-	-	1
CO5	-	-	-	-	-	2	1	3	-	-	-	-	-	3
CO6	-	-	-	-	-	2	1	2	3	-	-	-	-	2
														3



OBJECTIVES

To gain knowledge about the ambient air quality

- To understand effects of meteorology on air pollution and wind profiles.
- To know the control measures to overcome the particulate contaminants.
- To implement the preventive measures for gaseous contaminants.
- To impart knowledge on the principle and design of control of Indoor air pollutants.
- To understand the atmospheric process and pollutant transport mechanism
-

UNIT I INTRODUCTION 7

Structure and composition of Atmosphere – Definition, Scope and Scales of Air Pollution – Sources and classification of air pollutants and their effect on human health, vegetation, animals, property, aesthetic value and visibility- Ambient Air Quality and Emission standards.

UNIT II METEOROLOGY 6

Effects of meteorology on Air Pollution - Fundamentals, Atmospheric stability, Inversion, Wind profiles and stack plume patterns- Atmospheric Diffusion Theories – Dispersion models, Plume rise.

UNIT III CONTROL OF PARTICULATE CONTAMINANTS 11

Factors affecting Selection of Control Equipment – Gas Particle Interaction – Working principle - Gravity Separators, Centrifugal separators Fabric filters, Particulate Scrubbers, Electrostatic Precipitators.

UNIT IV CONTROL OF GASEOUS CONTAMINANTS 11

Factors affecting Selection of Control Equipment – Working principle - absorption, Adsorption, condensation, Incineration, Bio filters – Process control and Monitoring.

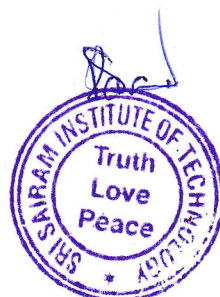
UNIT V INDOOR AIR QUALITY MANAGEMENT 10

Sources, types and control of indoor air pollutants, sick building syndrome and Building related illness- Sources and Effects of Noise Pollution – Measurement – Standards –Control and Preventive measures.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Lawrence K. Wang, Norman C. Pareira, Yung Tse Hung, “Air Pollution Control Engineering”, Tokyo, springer science + science media LLC,2004.
2. Noel de Nevers, “Air Pollution Control Engineering”, Waveland press,Inc 2017.
3. Anjaneyulu. Y, “Air Pollution and Control Technologies”, Allied Publishers (P) Ltd., India 2002.



REFERENCES:

1. David H.F. Liu, Bela G. Liptak, "Air Pollution", Lweis Publishers, 2000.
2. Arthur C. Stern, "Air Pollution (Vol.I – Vol.VIII)", Academic Press, 2006.
3. Wayne T.Davis, "Air Pollution Engineering Manual", John Wiley & Sons, Inc, 2000.
4. M.N Rao and HVN Rao, "Air Pollution", Tata Mcgraw Hill Publishing Company limited,2007.
5. C.S.Rao, "Environmental Pollution Control Engineering", New Age International(P) Limited Publishers,2006.

OUTCOMES:

- an understanding of the nature and characteristics of air pollutants, noise pollution and basic concepts of air quality management
- ability to identify, formulate and solve air and noise pollution problems
- ability to design stacks and particulate air pollution control devices to meet applicable standards.
- ability to select appropriate pollution control equipments.
- ability to ensure quality, control and preventive measures.
- ability to identify the methods involved in pollutant transport mechanism

CO - PO, PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	1	1	1	2	2					2		
CO2	3	1	2	2	2	1	1					1		
CO3	2	2	2	2	2	1	1				1	1		
CO4	2	2	2	2	2	1	1				1	1		
CO5	3	2	1	2	1	1	2	1				1		
CO6	3	3	2	2	2	1		2						



OBJECTIVES

- To make the student conversant with the water treatment methods including adsorption and Oxidation process.
- To provide basic understandings about the requirements of water, its preliminary treatment.

UNIT I WATER QUALITY AND PRELIMINARY TREATMENT

9

Water Quality-physical- chemical and biological parameters of water- water quality requirement -potable water standards -wastewater effluent standards -water quality indices. Water purification systems in natural systems- physical processes-chemical processes and biological processes primary, secondary and tertiary treatment-Unit operations-unit processes. Mixing, clarification -sedimentation; Types; aeration and gas transfer – coagulation and flocculation, coagulation processes - stability of colloids - destabilization of colloids- transport of colloidal particles, clariflocculation.

UNIT II INDUSTRIAL WATER TREATMENT

9

Filtration – size and shape characteristics of filtering media – sand filters hydraulics of filtration –design considerations – radial, upflow, highrate and multimedia filters, pressure filter. Water softening – lime soda, zeolite and demineralization processes – industrial water treatment for boilers.

UNIT III CONVENTIONAL TREATMENT METHODS

9

Taste and odour control – adsorption – activated carbon treatment – removal of color – iron and manganese removal – aeration, oxidation, ion exchange and other methods – effects of fluorides – fluoridation and defluoridation – desalination - corrosion prevention and control – factors influencing corrosion – Langelier index – corrosion control measures.

UNIT IV WASTEWATER TREATMENT

9

Wastewater treatment – pre and primary treatment – equalization neutralization – screening and grid removal – sedimentation – oil separation gas stripping of volatile organics – biological oxidation – lagoons and stabilization basins – aerated lagoons – activated sludge process –trickling filtration – anaerobic decomposition.

UNIT V ADSORPTION AND OXIDATION PROCESSES

9

Chemical process – adsorption – theory of adsorption – ion exchange process – chemical oxidation – advanced oxidation process – sludge handling and disposal – miscellaneous treatment processes.

TOTAL: 45 PERIODS

TEXTBOOKS:

1. Metcalf and Eddy, "Wastewater Engineering", 4th ed., McGraw Hill Higher Edu., 2002.
2. W. Wesley Eckenfelder, Jr., "Industrial Water Pollution Control", 2nd Edn., McGraw Hill Inc., 1989.

REFERENCES:

1. S.P. Mahajan, "Pollution control in process industries", 27th Ed. Tata McGraw Hill Publishing Company Ltd., 2012.



2. M. Lancaster, "Green Chemistry: An Introductory Text", 2nd edition, RSC publishing, 2010.
3. C.S. Rao, "Environmental Pollution Control Engineering", New Age International, 2007

OUTCOMES

- Will gain idea about waste water and its characteristics.
- Will gain knowledge on industrial water treatment.
- Will appreciate the necessity of water and acquire knowledge of preliminary treatment.
- Will gain idea about various methods available for water treatment.
- Will have knowledge about adsorption and oxidation process.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	2	2	-	1	1	3	2	3	2	2	3	2
CO2	-	3	3	1	1	2	3	3	2	3	3	2	3	2
CO3	2	1	1	2	-	1	2	3	1	3	1	2	3	2
CO4	-	3	3		2	3	3	3	2	3	3	2	3	2
CO5	-	1	2	2	-	1	1	3	1	3	2	1	3	2
CO6	2	1	2	2	-	1	1	3	2	3	2	2	3	2

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OBJECTIVES:

- To provide students an exposure to disasters, their significance and types.
- To ensure that students begin to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction
- To gain a preliminary understanding of approaches of Disaster Risk Reduction (DRR)
- To enhance awareness of institutional processes in the country and
- To develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity

UNIT I**INTRODUCTION TO DISASTERS****9**

Definition: Disaster, Hazard, Vulnerability, Resilience, Risks – Disasters: Types of disasters – Earthquake, Landslide, Flood, Drought, Fire etc – Classification, Causes, Impacts including social, economic, political, environmental, health, psychosocial, etc.- Differential impacts- in terms of caste, class, gender, age, location, disability – Global trends in disasters: urban disasters, pandemics, complex emergencies, Climate change- Dos and Don'ts during various types of Disasters.

UNIT II**APPROACHES TO DISASTER RISK REDUCTION (DRR)****9**

Disaster cycle – Phases, Culture of safety, prevention, mitigation and preparedness community based DRR, Structural- nonstructural measures, Roles and responsibilities of- community, Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), States, Centre, and other stake-holders- Institutional Processes and Framework at State and Central Level- State Disaster Management Authority(SDMA) – Early Warning System – Advisories from Appropriate Agencies.

UNIT III INTER-RELATIONSHIP BETWEEN DISASTERS AND DEVELOPMENT**9**

Factors affecting Vulnerabilities, differential impacts, impact of Development projects such as dams, embankments, changes in Land-use etc.- Climate Change Adaptation- IPCC Scenario and Scenarios in the context of India – Relevance of indigenous knowledge, appropriate technology and local resources.

UNIT IV**DISASTER RISK MANAGEMENT IN INDIA****9**

Hazard and Vulnerability profile of India, Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management, Institutional arrangements (Mitigation, Response and Preparedness, Disaster Management Act and Policy – Other related policies, plans, programmes and legislation – Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster – Disaster Damage Assessment.

UNIT V DISASTER MANAGEMENT: APPLICATIONS AND CASE STUDIES AND FIELD WORKS**9**

Landslide Hazard Zonation: Case Studies, Earthquake Vulnerability Assessment of Buildings and Infrastructure: Case Studies, Drought Assessment: Case Studies, Coastal Flooding: Storm Surge Assessment, Floods: Fluvial and Pluvial Flooding: Case Studies; Forest Fire: Case Studies, Man Made disasters: Case Studies, Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.

TOTAL: 45 PERIODS

OUTCOMES:

The students will be able to

- Differentiate the types of disasters, causes and their impact on environment and society
- Assess vulnerability and various methods of risk reduction measures as well as mitigation
- Understand the Relationship between Disaster and Development
- Draw the hazard and vulnerability profile of India, Scenarios in the Indian context
- Disaster damage assessment and management

TEXTBOOKS:

1. Singhal J.P. Disaster Management, Laxmi Publications, 2010. ISBN-10: 9380386427 ISBN-13: 978-9380386423
2. Tushar Bhattacharya, Disaster Science and Management, McGraw-Hill India Education Pvt. Ltd., 2012. ISBN-10: 1259007367, ISBN-13: 978-1259007361]
3. Gupta Anil K, Sreeja S. Nair. Environmental Knowledge for Disaster Risk Management, NIDM, New Delhi, 2011
4. Kapur Anu Vulnerable India: A Geographical Study of Disasters, IAS and Sage Publishers, New Delhi, 2010.

REFERENCES

1. Govt. of India: Disaster Management Act , Government of India, New Delhi, 2005
2. Government of India, National Disaster Management Policy, 2009.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1					3	2		2	2	2				
CO2	1							2	1	1		2	2	
CO3	1					2		2	2	3		2	2	
CO4								3				2	2	
CO5					2	2		3	2	2		2	2	
CO6					3	2		2	2	2				



OBJECTIVES:

- To understand the basic concepts of EIA
- To assess various environmental impacts
- To understand the process of report preparation
- To understand the socio economic impacts

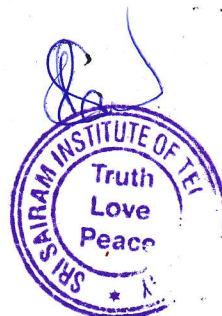
UNIT I	INTRODUCTION	9
Impacts of Development on Environment – Rio Principles of Sustainable Development- Environmental Impact Assessment (EIA) – Objectives – Historical development – EIA Types – EIA in project cycle –EIA Notification and Legal Framework.		
UNIT II	ENVIRONMENTAL ASSESSMENT	9
Screening and Scoping in EIA – Drafting of Terms of Reference, Baseline monitoring, Prediction and Assessment of Impact on land, water, air, noise, flora and fauna - Matrices – Networks – Checklist Methods - Mathematical models for Impact prediction.		
UNIT III	ENVIRONMENTAL MANAGEMENT PLAN	9
Plan for mitigation of adverse impact on water, air and land, water, energy, flora and fauna – Environmental Monitoring Plan – EIA Report Preparation – Public Hearing-Environmental Clearance		
UNIT IV	SOCIO ECONOMIC ASSESSMENT	9
Baseline monitoring of Socio economic environment – Identification of Project Affected Personal – Rehabilitation and Resettlement Plan- Economic valuation of Environmental impacts – Cost benefit Analysis-		
UNIT V	CASE STUDIES	9
EIA case studies pertaining to Infrastructure Projects – Roads and Bridges – Mass Rapid Transport Systems - Airports - Dams and Irrigation projects - Power plants.		

TOTAL : 45 PERIODS**TEXT BOOKS:**

1. Canter, R.L, "Environmental impact Assessment ", 2nd Edition, McGraw Hill Inc, New Delhi, 1995.
2. Lohani, B., J.W. Evans, H. Ludwig, R.R. Everitt, Richard A. Carpenter, and S.L. Tu, "Environmental Impact Assessment for Developing Countries in Asia", Volume 1 – Overview, Asian Development Bank, 1997.
3. Peter Morris, Riki Therivel "Methods of Environmental Impact Assessment", Routledge Publishers, 2009.

REFERENCES:

1. Becker H. A., Frank Vanclay, "The International handbook of social impact assessment" conceptual and methodological advances, Edward Elgar Publishing, 2003.
2. Barry Sadler and Mary McCabe, "Environmental Impact Assessment Training Resource Manual", United Nations Environment Programme, 2002.



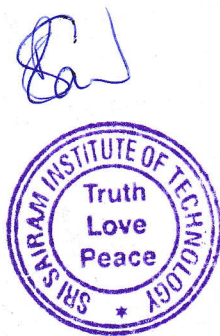
3. Judith Petts, "Handbook of Environmental Impact Assessment Vol. I and II", Blackwell Science New York, 1998.
4. Ministry of Environment and Forests EIA Notification and Sectoral Guides, Government of India, New Delhi, 2010.

OUTCOMES:

The students completing the course will have ability to

- carry out scoping and To screening of developmental projects for environmental and social assessments
- able to explain different methodologies for environmental impact prediction and assessment
- able to plan environmental impact assessments and environmental management plans
- to evaluate environmental impact assessment reports
- to understand the impacts of projects on environment

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSC
CO1					3	2		2	2	2				
CO2	1							2	1	1		2	2	
CO3	1					2		2	2	3		2	2	
CO4								3				2	2	
CO5					2	2		3	2	2		2	2	
CO6					3	2		2	2	2				



OBJECTIVES:

- The student should be able to apply ethics in society.
- To Discuss the ethical issues related to engineering and realize the responsibilities.
- To Learn about Rights of Engineers in the society.
- To learn about Intellectual property rights (IPR) and to get knowledge about Patents obtaining
- To learn about corporate working environment, and work ethics

UNIT I HUMAN VALUES

10

Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self confidence – Character – Spirituality – Introduction to Yoga and meditation for professional excellence and stress management.

UNIT II ENGINEERING ETHICS

9

Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Models of professional roles - Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories.

UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION

9

Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A
Balanced Outlook on Law.

UNIT IV SAFETY, RESPONSIBILITIES AND RIGHTS

9

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk - Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination. UNIT V
GLOBAL ISSUES 8

Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership – Code of Conduct – Corporate Social Responsibility.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Mike W. Martin and Roland Schinzinger, "Ethics in Engineering", Tata McGraw Hill, New Delhi, 2003.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.

REFERENCES:

1. Charles B. Fleddermann, "Engineering Ethics", Pearson Prentice Hall, New Jersey, 2004.
2. Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, "Engineering Ethics – Concepts and Cases", Cengage Learning, 2009.
3. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003



4. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001.
5. Laura P. Hartman and Joe Desjardins, "Business Ethics: Decision Making for Personal Integrity and Social Responsibility" Mc Graw Hill education, India Pvt. Ltd., New Delhi, 2013.
6. World Community Service Centre, ' Value Education', Vethathiri publications, Erode, 2011.

OUTCOMES:

- To acquire the basic knowledge of human values, moral, ethics, industrial standards, code of ethics and role of professional ethics in engineering field.
- To have an awareness of professional rights and responsibilities of an engineer, and to have an understanding for safety and risk benefit analysis.
- To imbibe the various ethical theories developed and apply them for a professional and societal advancement.
- To imbibe adequate knowledge about the culture & the value system adopted by MNC's, local business houses and to create an ethical based work environment.
- To understand and solve the employees' conflict & grievances in an amicable and ethical way.
- Formulate and provide solutions to overcome ethical issues for win-win outcome.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3			1	1	3	2	2		2	2	3
CO2	2	2	2			1	1	3	2	2		2	2	2
CO3	2	1	1			1	1	3	2	2		2	2	3
CO4	2	2	2			1	1	3	2	2		2	2	2
CO5	2	1	1			1	1	3	2	2		2	2	3
CO6	2	1	1			1	1	3	2	2		2	2	3

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OBJECTIVES :

- To sensitize the Engineering students to various aspects of Human Rights.

UNIT I

Human Rights – Meaning, origin and Development. Notion and classification of Rights – Natural, Moral and Legal Rights. Civil and Political Rights, Economic, Social and Cultural Rights; collective / Solidarity Rights. 9

UNIT II

Evolution of the concept of Human Rights Magna carta – Geneva convention of 1864. Universal Declaration of Human Rights, 1948. Theories of Human Rights. 9

UNIT III

Theories and perspectives of UN Laws – UN Agencies to monitor and compliance. 9

UNIT IV

Human Rights in India – Constitutional Provisions / Guarantees. 9

UNIT V

Human Rights of Disadvantaged People – Women, Children, Displaced persons and Disability persons, including Aged and HIV Infected People. Implementation of Human Rights – National and State Human Rights Commission – Judiciary – Role of NGO's, Media, Educational Institutions, Social Movements. 9

TOTAL : 45 PERIODS

REFERENCES:

- Kapoor S.K., "Human Rights under International law and Indian Laws", Central Law Agency, Allahabad, 2014.
- Chandra U., "Human Rights", Allahabad Law Agency, Allahabad, 2014.
- Uppendra Baxi, The Future of Human Rights, Oxford University Press, New Delhi.

COURSE OUTCOMES

- Recognize the human rights and its types(K1)
- Describe the concepts of human rights belongs to everybody(K2)
- Select the appropriate laws for rights and responsibilities(K2)
- Explain the Constitutional Provisions Involved in Human Rights(K2)
- Interpret the usage of Human Rights for Special Category People(K2)
- Explain the contribution of Society developing organizations towards Human Rights(K2)



CO - PO, PSO MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	P11	P12	PSO1	PSO2
CO1	2	2	2	-	-	-	1	-	-	-	-	1	2	1
CO2	2	2	2	-	-	-	1	-	-	-	-	1	2	1
CO3	2	2	2	-	1	-	-	-	-	-	-	1	2	1
CO4	2	2	2	-	1	-	-	-	-	-	-	1	2	1
CO5	2	2	2	-	1	-	-	-	-	-	-	1	2	1
CO6	2	2	2	-	1	-	1	-	-	-	-	1	2	1

OBJECTIVES:

- To study the nature and facts about environment.
- To finding and implementing scientific, technological, economic and political solutions to environmental problems.
- To study the interrelationship between living organism and environment.
- To appreciate the importance of environment by assessing its impact on the human world; envision the surrounding environment, its functions and its value.
- To study the dynamic processes and understand the features of the earth's interior and surface.
- To study the integrated themes and biodiversity, natural resources, pollution control and waste management.

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY 14

Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity. Field study of common plants, insects, birds; Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT II ENVIRONMENTAL POLLUTION 8

Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – solid waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides. Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT III NATURAL RESOURCES 10

Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over- utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in



conservation of natural resources – Equitable use of resources for sustainable lifestyles. Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT 7

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns, case studies – role of non-governmental organization- environmental ethics: Issues and possible solutions – climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – wasteland reclamation – consumerism and waste products – environment production act – Air (Prevention and Control of Pollution) act – Water (Prevention and control of Pollution) act – Wildlife protection act – Forest conservation act – enforcement machinery involved in environmental legislation- central and state pollution control boards- Public awareness.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT 6

Population growth, variation among nations – population explosion – family welfare-programme – environment and human health – human rights – value education – HIV / AIDS – women and child welfare – role of information technology in environment and human health – Case studies.

TOTAL: 45 PERIODS

OUTCOMES:

- Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.
- Public awareness of environmental is at infant stage.
- Ignorance and incomplete knowledge has lead to misconceptions
- Development and improvement in std. of living has lead to serious environmental disasters

TEXTBOOKS:

1. Benny Joseph, ‘Environmental Science and Engineering’, Tata McGraw-Hill, New Delhi, 2006.
2. Gilbert M.Masters, ‘Introduction to Environmental Engineering and Science’, 2nd edition, Pearson Education, 2004.

REFERENCES :

1. Dharmendra S. Sengar, ‘Environmental law’, Prentice hall of India PVT LTD, New Delhi, 2007.
2. Erach Bharucha, —Textbook of Environmental Studies!, Universities Press(I) PVT, LTD, Hyderabad, 2015.
3. Rajagopalan, R, ‘Environmental Studies-From Crisis to Cure’, Oxford University Press, 2005.
4. G. Tyler Miller and Scott E. Spoolman, —Environmental Sciencel, Cengage Learning India PVT, LTD, Delhi, 2014.



OUTCOMES

- Develop Java programs using OOP principles
- Develop Java programs with the concepts inheritance and interfaces
- Build Java applications using exceptions and I/O streams
- Develop Java applications with threads and generics classes
- Develop interactive Java programs using swings
- Design and build simple Graphical User Interfaces

CO - PO, PSO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	0	0	0	0	0	0	0	0	0	0	0
CO2	2	2	3	0	3	0	0	0	0	0	0	1
CO3	2	2	3	0	3	0	0	0	0	0	0	1
CO4	2	2	3	0	3	0	0	0	0	0	1	1
CO5	2	2	3	3	3	0	0	0	0	0	0	1
CO6	2	2	3	3	3	0	0	0	0	0	0	1



**1.1.2 Programmes where syllabus revision was carried out during
the last five years**



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MINUTES OF FIRST ACADEMIC COUNCIL MEETING

The 2nd and 3rd Academic Council (AC) meeting of Sri Sairam Institute of Technology was conducted on 23.12.2021 through online (ZOOM) mode at 10.30 AM (IST). The following members were present.

Dr.K.Palanikumar

Principal

Sri Sai Ram Institute of Technology

West Tambaram

Chennai

Chairman

EXTERNAL MEMBERS:

Dr.K.Sankaranarayananasamy

Director

National Institute of Technology

Puducherry

Thiruvettakudy, Karaikal

Senior Member

Dr.K.Sundareswaran

Senior Professor

Department of EEE

National Institute of Technology

Tiruchirappalli

University Nominee

Prof.Banshidhar Majhi

Vice Chancellor

Veer Surendra Sai University of Technology,

Burla, Sambalpur, Odisha,

India. PIN:768018

University Nominee

Prof.Dr.Sudhindra Nath panda

Dean (Faculty and Academic Affairs)

School of Engineering and Applied Sciences

SRM University AP,

Neerukonda, Mangalagiri

Guntur District, Andhra Pradesh 522240

University Nominee

Dr.I.A.Palani

Dean (Research & Development)

Indian Institute of Technology Indore

Khandwa Road, Simrol

Indore

Member

Mr.Vasudevan Rajagopalan

Head-Talent Acquisition(India)

Tata Consultancy Services

Thoraipakkam

Chennai

Member

Dr.R.Venkatesan
Scientist 'G' & Programme Director
National Institute of Ocean Technology
Pallikaranai
Chennai

Member

INTERNAL MEMBERS

Dr.S.Rajarajan
Dean - Academics
Sri Sai Ram Institute of Technology
West Tambaram
Chennai

Member Secretary

Dr.G.Thamaraiselvi
Head of the Department
Department of ECE
Sri Sai Ram Institute of Technology
West Tambaram
Chennai

Member

Dr.B.Sreedevi
Head of the Department
Department of CSE
Sri Sai Ram Institute of Technology
West Tambaram
Chennai

Member

Dr.G.Prakash
Head of the Department
Department of EEE
Sri Sai Ram Institute of Technology
West Tambaram
Chennai

Member

Dr.S.Murali
Head of the Department
Department of Mechanical Engineering
Sri Sai Ram Institute of Technology
West Tambaram
Chennai

Member

Dr.G. Shanmugasundar
Dean (R&D)
Sri Sai Ram Institute of Technology
West Tambaram
Chennai

Member

Dr.C.R.Senthilnathan
Head of the Department
Department of MBA
Sri Sai Ram Institute of Technology
West Tambaram
Chennai

Member

Dr.Rathika **Member**
Associate Professor
Department of Chemistry
Sri Sai Ram Institute of Technology
West Tambaram
Chennai

Dr.V.Brindhadevi **Member**
Head of the Department
Department of IT
Sri Sai Ram Institute of Technology
West Tambaram
Chennai

Mr.V.Balaji **Member**
Associate Professor
Department of Mathematics
Sri Sai Ram Institute of Technology
West Tambaram
Chennai

Dr.K.PALANIKUMAR, the Chairman of Academic council opened the meeting by welcoming all the members. He explained that this meeting is treated as 2nd and 3rd meeting due to Corona Pandemic. As all the members have given their consent in the email already, for the previous activities, the minutes are registered for 2nd and 3rd meeting. **Dr S.Rajarajan, Dean (Academics)** placed the following agenda for the deliberations and discussions by the members. The extracts of the deliberations of the meeting are as follows.

AC.SIT.21.02.01: To review the Previous meeting action points and Action taken.

1. All the action points discussed in the previous academic council meeting have been reviewed.
2. Dr.R.Venkatesan appreciated the efforts taken for implementing the action points into action.
3. All other members were also accepted the action taken report submitted for the due approval.

Resolved to approve the action points of previous meeting and accepted the action taken.

AC.SIT.21.02.02: To review and approve the minutes of BoS of the seven Engineering UG Programmes in CSE, AI-DS, CCE, IT, ECE, EEE, and MECH for the 3rd and 4th semesters.

1. **Dr.K.Sankaranarayanan** expressed the following points:
 - a) Need to Check the credits point of some Practical Courses - 1.5 credit
 - b) Fourth Semester Credit of B.Tech (AI & DS) needs to be reduced

- c) M.E Industrial Safety –For the Paper Data Analytics –credits need to be checked.
- d) Proposal of conducting mock test before End Semester Exam.
- e) Suggested to arrange an Industry person for handling elective papers for MBA Programme.

2. Dr.Sudhindra Nath Panda discussed the following points.

- a) Live-in Labs need to be collaborated with Industry
- b) Outcome of the implementation of live-in-lab in terms of Patent, Publication need to be shown
- c) For each elective specialization of MBA curriculum increase the number of courses.
- d) Suggested to coin a Mission to attract foreign students.
- e) In MBA, IPR need to be given more priority.
- f) Suggested to check the syllabus and curriculum of IIT –Kharagpur for specialized subjects in MBA.

3. Dr.R.Venkatesan suggested the following points.

- a) Suggested to separate Fluid mechanics and Machinery subjects in Mechanical Engineering.
- b) He emphasized the thermodynamics basics which are much needed for higher studies.
- c) He added that the number of Practicals for AI&DS course may be reduced.
- d) For MBA Programme, International Business Management he suggested to refer IISC syllabus
- e) He strongly insisted to have a law course in MBA.

4. Dr.I.A.Palani suggested the following points.

- a) He asked the clarity of mixing Theory and Laboratory courses like Linear Integrated Circuits.
- b) He mentioned that the content of Bio medical Signal and Image Processing and suggested to shift it to higher semester.

5. Dr.Bhanshidar Mahji suggested the following points.

- a) Name of the Subject Bio medical Signal and Image Processing may be changed in AI & DS
- b) This subject may be kept as Image Processing separately and Bio medical signals and imaging separately.

Resolved to approve the minutes of BoS of the seven Engineering UG Programmes in CSE, AI-DS, CCE, IT, ECE, EEE, and MECH for the 3rd and 4th semesters.

AC.SIT.21.02.03: To review and approve the minutes of BoS of the Two Engineering PG Programmes ISE, Big Data & Management PG Programme MBA

The following points had been suggested by all the members,

- a) Suggested to conduct mock test before End Semester Exam for PG programmes also.
- b) Suggested to arrange an Industry person for handling elective papers for MBA Programme.
- c) For each elective specialization of MBA curriculum increase the number of courses.
- d) Suggested to coin a Mission to attract foreign students.

- e) In MBA, IPR need to be given more priority.
- f) Suggested to check the syllabus and curriculum of IIT –Kharagpur for specialized subjects in MBA.
- g) Strongly insisted to have a law course in MBA.

Resolved to approve the minutes of BoS of the Two Engineering PG Programmes ISE, Big Data & Management PG Programme MBA

AC.SIT.21.02.04: To review and approve the Annual Quality Assurance Report for the year (2020-21) to be submitted to the NAAC.

- a) With back and forth discussions among the Chairman, IQAC Coordinator Dr.S.Murali and all remaining members, the Annual Quality Assurance Report have been reviewed.
- b) They insisted to include all the missing activities/events in the Annual Quality Assurance Report.

Resolved to approve the Annual Quality Assurance Report for the year (2020-21) to be submitted to the NAAC.

AC.SIT.20.02.05: To submit the published results of previous semesters.

- a) The Dean (Academics) submitted the results of previous Odd and Even semesters for the Academic year 2020-21 for the academic council members.

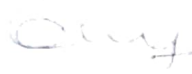
AC.SIT.21.02.06: To approve the physical offline mode of examination for the current ODD semester.

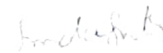
- a) The forth coming Semester (AY 2021-22 ODD) is to be conducted in OFFLINE physical mode. This request was submitted in front of the Council for approval.


Resolved to adopt the physical offline mode of examination for the current ODD semester.

The Academic Council meeting of Sri Sai Ram Institute of Technology ended with vote of thanks by **Dr.G.ThamaraiSelvi**, Controller of Examinations.


The following members were present during this Academic Council meeting.



(Dr.K.Sankaranarayanan)
National Institute of Technology
Puducherry.
Thiruvettakudy, Karaikal.



(Dr.K.Sundareswaran)
Senior Professor
Department of EEE
National Institute of Technology
Tiruchirappalli



(Prof.Dr.Sudhindra Nath panda)
Dean (Faculty and Academic Affairs)
School of Engineering and Applied
Sciences, SRM University (AP).



(Prof.Banshidhar Majhi)
Vice Chancellor
Veer Surendra Sai University of
Technology,
Burla, Sambalpur, Odisha,
India. PIN:768018



(Mr.Vasudevan Rajagopalan)
Head-Talent Acquisition(India)
Tata Consultancy Services
Thoraipakkam
Chennai



(Dr.R.Venkatesan)
Scientist 'G' & Programme Director
National Institute of Ocean Technology
Pallikaranai
Chennai

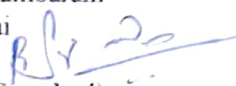

(Dr.I.A.Palani)
Dean (Research & Development)
Indian Institute of Technology Indore
Khandwa Road, Simrol
Indore.

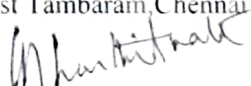

(Dr.S.Rajarajan)
Dean – Academics
Sri Sai Ram Institute of Technology
West Tambaram, Chennai


(Dr.G. Shanmugasundar)
Dean(R&D)
Department of Mechanical Engineering
Sri Sai Ram Institute of Technology
West Tambaram, Chennai


(Dr.G.Thamaraiselvi)
Head of the Department
Department of ECE
Sri Sai Ram Institute of Technology
West Tambaram
Chennai


(Dr.S.Murali)
Head of the Department/
IQAC Coordinator
Department of Mechanical Engineering
Sri Sai Ram Institute of Technology
West Tambaram, Chennai


(Dr.B.Sreedevi)
Head of the Department
Department of CSE
Sri Sai Ram Institute of Technology
West Tambaram, Chennai.


(Dr.C.R.Senthilnathan)
Head of the Department/MBA
Sri Sai Ram Institute of Technology
West Tambaram, Chennai.

(Dr. Rathika)
Head of the Department (S&H)
Department of Chemistry
Sri Sai Ram Institute of Technology
West Tambaram, Chennai

(Dr. Su. Suganthi)
Head of the Department/CCE
Sri Sai Ram Institute of Technology
West Tambaram,
Chennai

(Dr. V. Brindha Devi)
Head of the Department
Department of IT
Sri Sai Ram Institute of Technology
West Tambaram, Chennai

(Dr. M. Priya)
Head of the Department/AI&DS
Sri Sai Ram Institute of Technology
West Tambaram
Chennai

(Dr. G. Prakash)
Head of the Department
Department of EEE
Sri Sai Ram Institute of Technology
West Tambaram, Chennai.

(Mr. V. Balaji)
Associate Professor
Department of Mathematics
Sri Sai Ram Institute of Technology
West Tambaram, Chennai

(Dr. K. Palanikumar)
Chairman (Academic Council)
Principal
Sri Sai Ram Institute of Technology
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Chennai.



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No.SSIT,Ch-44/BOS-2/2021

Date: 20.07.2021

NOTICE

A Second meeting of the Board of Studies in Electrical and Electronics Engineering will be held at 11.30 A.M on Wednesday, 28th July 2021 through online mode for our Sri Sai Ram Institute of Technology, Chennai-44.

The meeting I.D & Password will be sent through email.

T.A & D.A will be paid as per University Rules.

Kindly make it convenient to attend the meeting.

PRINCIPAL

PRINCIPAL

SRI SAIRAM INSTITUTE OF TECHNOLOGY
SAI LEO NAGAR, CHENNAI-600 044.

AGENDA

- 1) Recommendation regarding the curriculum and syllabus.
- 2) Others, if any.

To

Board of Studies Members

S.NO	NAME	DESIGNATION
1	Dr.G.Prakash	Professor & Head of the Department, Department of EEE, Sri Sai Ram Institute of Technology,Chennai.
2	Dr.Jeevananthan	Professor, Department of Electrical and Electronics Engineering, Pondicherry Engineering College, Puducherry-605014
3	Dr.R.Bens Raj	Associate Professor, Department of Electrical Engineering, Annamalai University, Annamalai Nagar-608002.

4	Dr.B.Priya	Professor, Department of Electrical Engineering, Rajalakshmi Engineering College, Rajalakshmi Nagar, Thandalam, Chennai- 602105
5	Dr.G.Swaminathan	Associate General Manager, Schneider Electric (R&D), Bangalore
6	Mr.S.Sujay Sudharsan	Executive Director, Professional Elevators PVT Ltd Chennai Chennai
7	Mr.A.Anbazhagan	Associate professor, Department of EEE, Sri Sai Ram Institute of Technology, Chennai.
8	Dr.M.Jagadheeshkumar	Professor, Department of EEE, Sri Sai Ram Institute of Technology, Chennai.
9	Mrs.E.Maheswari	Associate professor, Department of EEE, Sri Sai Ram Institute of Technology, Chennai.
10	Mrs.N.Shanthi	Associate professor, Department of EEE, Sri Sai Ram Institute of Technology, Chennai.



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Agenda

- BOS.EEE.21.01.01** : To review and approve the action taken on reformatations planned in I BoS
- BOS.EEE.21.01.02** : To review and approve the additional Elective courses included in the B.E EEE Programme Curriculum
- BOS.IT.21.01.03** : To review and approve the curriculum and syllabus of 3rd and 4th semester UG programme in B.E /EEE Programme.
- BOS.IT.21.01.04** : List of Professional and open Elective courses in B.E EEE Programme



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Department of Electrical and Electronics Engineering

Board of Studies (BoS) Members

SL NO	NAME	DESIGNATION
1	Dr.B.Priya	Professor/Electrical and Electronics Engineering, Rajalakshmi Engineering College, Rajalakshmi Nagar,Thandalam, Chennai-602105
2	Dr.Jeevananthan	Professor/Electrical and Electronics Engineering, Pondicherry Engineering College,Puducherry-605014.
3	Dr.R.Bens Raj	Associate Professor, Department of Electrical Engineering, Annamalai University, Annamalai nagar-608002
4	Dr.G.Swaminathan	Associate General Manager,Schneider Electric (R&D), Bangalore.
5	Mr.S.Sujay Sudharsan	Executive irector Professional Elevators PVT Ltd Chennai.
6	Dr.G.Prakash	Professor& Head of the Department, Department of Electrical and Electronics Engineering, Sri Sairam Institute of Technology, Chennai-44
7	Dr.M.Jagadeesh Kumar	Professor, Department of Electrical and Electronics Engineering, Sri Sairam Institute of Technology, Chennai-44
8	Mr.A.Anbazhagan	Associate Professor, Department of Electrical and Electronics Engineering, Sri Sairam Institute of Technology, Chennai-44
9	Mrs.E.Maheswari	Associate Professor, Department of Electrical and Electronics Engineering, Sri Sairam Institute of Technology, Chennai-44
10	Mrs.N.Shanthi	Assistant Professor, Department of Electrical and Electronics Engineering, Sri Sairam Institute of Technology, Chennai-44



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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Minutes of the Second Board of Studies meeting

The Second Board of Studies (BOS) meeting of the department of EEE was conducted on 28.07.2021 through online mode (ZOOM) at 11.30A.M (IST). Following members were present.

- Dr.B.Priya** External stakeholder
Professor / EEE (University Representative)
Rajalakshmi Engineering College.,
RajalakshmiNagar ,Thandalam ,Tamil Nadu
602105
- Dr.Jeevananthan** External stakeholder
Professor (Subject Expert)
Pondicherry Engineering College
Puducherry-605014.
- Dr.R.Bens Raj** External stakeholder
Associate Professor (Subject Expert)
Department of Electrical Engineering
Annamalai University,
Annamalai Nagar, Chidambaram -608002
- Dr.G.Swaminathan** External stakeholder
Associate General Manager, (Industrial Expert)
Schneider Electric (R&D),
Bangalore.
- Mr.S.Sujay Sudharsan** External stakeholder
Executive Director (Alumni Member)
Professional Elevators PVT Ltd Chennai
Chennai
- Mr.A.Anbazhagan Internal stakeholder
- Dr.M.Jagadeesh Kumar Internal stakeholder
- Mrs.E.Maheswari Internal stakeholder
- Mrs.N.Shanthi Internal stakeholder
- Dr G.Prakash** Chairman, BoS/EEE
Professor& Head, EEE
Sri Sai Ram Institute of Technology

Dr.G.Prakash, Chairman of BoS has welcomed and introduced the external members to the internal members. The chairman placed the following agenda for the deliberations and discussions of the members. The following are the deliberations made during the meeting (as per the items of the circulated agenda).

BOS.EEE.21.02.01 To review and approve the action taken on reformations planned



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The suggestions given in the I BoS were incorporated and the same was presented to the members. The reformations presented were approved

BOS.EEE.21.02.02 To review and approve the additional Elective courses included in the B.E EEE Programme Curriculum

There are ten Elective courses included in the Professional Elective Category from Semester V to Semester VIII. The same were presented and the same was approved.

BOS.EEE.21.02.03: To review and approve the curriculum and syllabus of the 3rd and 4th semester UG programme in B.E /EEE Programme. The members recommended the following:

- a. **Dr.Jeevananthan** suggested to change the title Power Amplifiers and Oscillators instead of Differential Amplifiers and Power Amplifiers in UNIT II for the subject **20EEPC301 ANALOG ELECTRONICS**
- b. Suggested to change the title name Analog IC instead of Special ICs in UNIT V- for the subject **20EEPC301 ANALOG ELECTRONICS**
- c. Suggested to add three phase transformer and winding terminology in UNIT V for the subject **20EEPC302- DC MACHINES & TRANSFORMERS**
- d. Suggested to include the topics related to pulse, otherwise change the subject name Digital Logic Circuits instead of Pulse and Digital Circuits for the subject **20EEPC304 PULSE AND DIGITAL CIRCUITS.**
- e. Suggested that Prerequisite should be completed by the students before studying the Professional Elective(It should be verified for all the Professional Elective)-
- f. Based on the Placement company requirement, the important and crucial subjects will be added.
- g. Course outcomes should be changed based on the Blooms Taxonomy.
- h. Standard format should be maintained for the sub division topics.
- i. **Dr.B.Priya** suggested to include simulation part in Unit V for the subject **20EEPC304- PULSE AND DIGITAL CIRCUITS**
- j. **Dr.R.Bens Raj & Dr.B.Priya** suggested to change the topic Starting instead of Starters in UNIT V for the subject **20EEPC302 DC MACHINES & TRANSFORMERS** subject.
- k. **Mr.S.Sujay Sudharsan** suggested to change the title single phase induction motors instead of Single phase induction motors and special electrical machines in UNIT V for the subject **20EEPC401SYNCHRONOUS AND INDUCTION MACHINES**
- l. **Dr.B.Priya** suggested that the prerequisite should be added in the Objectives for all the subjects.
- m. Course outcomes should be verified in all the subjects based on Blooms Taxonomy.

Based on the suggestions given by the members, the Chairman of BoS concluded that the fruitful suggestions will be incorporated appropriately in the curriculum and syllabus



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open elective courses to the Academic Council for further approval.



BOS.EEE.21.02.04:

List of Professional and Open Elective Courses in B.E. EEE Programme

The members reviewed the list of four Professional electives offered in B.E /EEE Programme and gave the approval for the same.

In the concluding remarks, the chairman stated that the suggestions of credits in UG Curriculum and other recommendations suggested by the members would be considered.

Meeting then ended with a vote of thanks by Dr. S. Rajarajan, Professor / Dean – Academic, Sri Sai Ram Institute of Technology.

Dr. Jeevananthan
Professor,
Electrical and Electronics Engineering,
Pondicherry Engineering College,
Puducherry-605014

Dr. R. Bens Raj
Associate Professor
Electrical and Electronics
Engineering, Annamalai University,
Annamalai Nagar, 608002.

Dr. B. Priya
Professor/Electrical and Electronics Engineering
Rajalakshmi Engineering College,
Rajalakshmi Nagar,
Thandalam, Chennai-602105

Dr. G. Swaminathan
Associate General Manager,
Schneider Electric (R&D),
Bangalore.

Mr. S. Sujay Sudarshan

Executive Director, Professional
Elevators PVT Ltd Chennai.

Mr. A. Anbazhagan
Associate Professor

Mrs. E. Maheswari
Associate Professor

Dr. M. Jagadeesh Kumar
Professor

Mrs. N. Shanthi
Assistant Professor

Dr. G. Prakash,

Chairman, BoS/EEE
(Professor & Head/EEE)



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As per the suggestions and modifications of the respected members of the BoS, the **UG curriculum for the B.E. Degree in EEE has been modified and presented below.**

1. **20EEPC301 ANALOG ELECTRONICS:** Unit II title changed to “**Power Amplifiers and Oscillators**”. Unit V title changed to “**Analog ICs**”.
2. **20EEPC302 DC MACHINES & TRANSFORMERS:** The “Three phase transformer” added in Unit V. The winding terminology added for DC machines and Transformers.
Unit IV title changed to “**STARTERS, SPEED CONTROL AND TESTING OF DC MACHINES**”. The topic Starters and its types added.
3. **20EEPC304 PULSE AND DIGITAL CIRCUITS:** Subject name changed into “**DIGITAL LOGIC CIRCUITS**”. Examples for the Digital Simulation added in Unit V.
4. Prerequisite verified for all the Professional Elective.
5. The software and core related Professional elective subjects added based on the job requirement.
6. Course outcomes will be framed based on the Blooms Taxonomy and Prerequisite will be added in Objectives.



ANNEXURE-1

EEE Curriculum

Semester I

S.No.	Course Code	Course Title	L	T	P	Total	C
THEORY							
1	20BSMA101	Engineering Mathematics-I	3	1	0	4	4
2	20HSEN101	Technical English-I	3	0	0	3	3
3	20BSPH101	Engineering Physics	3	0	0	3	3
4	20BSCY101	Engineering Chemistry	3	0	0	3	3
5	20ESCS101	Problem solving and Programming In C	3	0	0	3	3
6	20ESGE101	Engineering Graphics	1	2	0	3	3
PRACTICAL							
7	20BSPL101	Physics and Chemistry Lab	0	0	3	3	1.5
8	20ESPL101	Programming in C lab	0	0	3	3	1.5
VALUE ADDITIONS 1							
9	20EETP101	Skill Enhancement	0	0	2	2	1
10	20MGHS101	Personal Values	2	0	0	2	0
Total						29	23



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Semester II

S.No.	Course Code	Course Title	L	T	P	Total	C
THEORY							
1	20BSMA201	Engineering Mathematics -II	3	1	0	4	4
2	20HSEN201	Technical English II	2	0	2	4	3
3	20ESIT201	Python Programming with lab	3	0	2	5	4
4	20BSPH201	Physics of Electron Devices	3	0	0	3	3
5	20BSCY201	Environmental Science and Engineering	3	0	0	3	3
6	20EEPC201	Electrical circuit Analysis	2	1	0	3	3
PRACTICAL							
7	20ESGE201	Engineering Practices Laboratory	0	0	3	3	1.5
8	20EEPL201	Electric Circuits and Simulation Lab	0	0	3	3	1.5
VALUE ADDITIONS 2							
9	20EETP201	Skill Enhancement	0	0	2	2	1
10	20HSMG201	Interpersonal Values	2	0	0	2	0
Total						32	24

Semester III

S.No.	Course Code	Course Title	L	T	P	Total	C
THEORY							
1	20EEPC301	Analog Electronics	3	0	0	3	3
2	20EEPC302	DC Machines and Transformers	2	1	0	3	3
3	20EEPC303	Electromagnetic theory	3	1	0	4	4
4	20EEPC304	Digital Logic Circuits	3	0	0	3	3
5	20BSMA301	Linear Algebra, Partial Differential Equations and Transforms.	3	1	0	4	4
PRACTICAL							
6	20EEPL301	Analog and Digital Circuits Laboratory	0	0	3	3	1.5
7	20EEPL302	DC Machines and Transformers Laboratory	0	0	3	3	1.5
8	20EETE301	Live-in-Lab – 1	0	0	2	2	1
VALUE ADDITIONS 3							
9	20EETP301	Skill Enhancement	0	0	2	2	1
10	20MGMC301	Constitution of India	2	0	0	2	0
Total						32	24

Semester V



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S.No.	Course Code	Course Title	L	T	P	Total	C
THEORY							
1	20EE PC 401	Synchronous and Induction Machines	2	1	0	3	3
2	20EE PC 402	Transmission and Distribution	3	0	0	3	3
3	20EE PC 403	Measurements and Instrumentation	3	0	0	3	3
4	20EE PC 404	Control Engineering	3	1	0	4	4
5	20BS MA 403	Statistics and Numerical methods	3	1	0	4	4
PRACTICAL							
6	20EE PL401	Synchronous and Induction Machines Laboratory	0	0	3	3	1.5
7	20EE PL402	Control Engineering and Instrumentation Laboratory	0	0	3	3	1.5
8	20EE TE401	Live-in-Lab 2	0	0	2	2	1
VALUE ADDITIONS 4							
9	20EE TP401	Skill Enhancement	0	0	2	2	1
Total						27	22

Semester V

S.No.	Course Code	Course Title	L	T	P	Total	C
THEORY							
1	20EEPC501	Power System Analysis	3	0	0	3	3
2	20EEPC502	Power Electronics	3	0	0	3	3
3	20EEPC503	Microprocessors and Microcontrollers	2	1	0	3	3
4	20XXELXXX	Professional Elective-I	3	0	0	3	3
5	20XXOEXXX	Open Elective -I	3	0	0	3	3
PRACTICAL							
6	20EEPL501	Power Electronics Laboratory	0	0	3	3	1.5
7	20EEPL502	Microprocessors and Microcontrollers Laboratory	0	0	3	3	1.5
8	20HSPL501	Communication and Soft Skills Laboratory	0	0	2	2	1
9	20EETE501	Live-in-Lab 3	0	0	4	4	2
VALUE ADDITIONS 5							
10	20EETP501	Skill Enhancement	0	0	2	2	1
Total						29	22



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Semester VI

S.No.	Course Code	Course Title	L	T	P	Total	C
THEORY							
1	20EEPC601	Solid State Drives	3	0	0	3	3
2	20EEPC602	Power System Operation and Control	3	0	0	3	3
3	20EEPW601	Embedded Systems and IoT with Laboratory	3	0	2	5	4
4	20ITPC301	Data structures	3	0	0	3	3
5	20XXELXXX	Professional Elective-II	3	0	0	3	3
6	20XXOEXXX	Open Elective –II	3	0	0	3	3
PRACTICAL							
7	20EEPL601	Power system simulation Laboratory	0	0	3	3	1.5
8	20ITPL301	Data Structures Laboratory	0	0	3	3	1.5
9	20EEPJ601	Innovative Design Project	0	0	2	2	1
VALUE ADDITIONS 6							
10	20EETP601	Skill Enhancement	0	0	2	2	1
Total						30	24

Semester VII

S.No.	Course Code	Course Title	L	T	P	Total	C
THEORY							
1	20EEPC701	Distributed Generation and microgrid	3	0	0	3	3
2	20EEPC702	Electrical Vehicles	3	0	0	3	3
3	20XXELXXX	Professional Elective-III	3	0	0	3	3
4	20XXELXXX	Professional Elective-IV	3	0	0	3	3
5	20HSMG601	Principles of Engineering Management	3	0	0	3	3
PRACTICAL							
6	20EEPL701	Renewable Energy Laboratory	0	0	4	4	2
7	20EEPJ701	Project Phase -1	0	0	4	4	2
VALUE ADDITIONS 7							
8	20EETP701	Skill Enhancement	0	0	2	2	1
Total						25	20



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Semester VII

S.No.	Course Code	Course Title	L	T	P	Total	C
THEORY							
1	20EEELXXX	PE-V	3	0	0	3	3
PRACTICAL							
2	20EEPJ801	Project Phase – 2	0	0	8	8	4
Total						11	7

Total credits

Semester No.	1	2	3	4	5	6	7	8
Credits	23	24	22	22	22	24	20	7
Internship								3
Total Credits								167



ANNEXURE -II

As per the suggestions and modifications prescribed by the respected members of the BoS, the Professional and Open electives of UG curriculum for the B.E. Degree in EEE has been modified and presented below.

Professional Elective-I

Sl No	Sub Code	Subject Name	L	T	P	Total	C	Stream
1	20EEEL501	Electric Energy Generation Systems	3	0	0	3	3	Power & Energy
2	20EEEL502	Power Engineering & Instrumentation	3	0	0	3	3	Power & Energy
3	20EEEL503	Solar And Wind Energy Systems	3	0	0	3	3	Power & Energy
4	20EEEL504	Design of Electrical Machines	3	0	0	3	3	Electrical Machines & Control
5	20EEEL505	Transducer Engineering	3	0	0	3	3	Electrical Machines & Control
6	20EEEL506	Electrical Engineering Materials	3	0	0	3	3	Electrical Machines & Control
7	20EEEL507	Discrete Time Signal Processing	3	0	0	3	3	Electronics & Embedded
8	20EEEL508	Arduino and Raspberry pi Based System Design	3	0	0	3	3	Electronics & Embedded
9	20EEEL509	Fundamentals of IOT for electrical Engineering	3	0	0	3	3	Computer Technology
10	20EEEL510	Industrial Safety	3	0	0	3	3	Industrial & Management



Professional Elective -II

Sl No	Sub Code	Subject Name	L	T	P	Total	C	Stream
1	20EEEL601	Power system Transients	3	0	0	3	3	Power & Energy
2	20EEEL602	High Voltage Engineering	3	0	0	3	3	Power & Energy
3	20EEEL603	Electric Energy Utilization and Conservation	3	0	0	3	3	Power & Energy
4	20EEEL604	Modeling and Analysis of Electrical Machines	3	0	0	3	3	Electrical Machines & Control
5	20EEEL605	Medical instrumentation	3	0	0	3	3	Electrical Machines & Control
6	20EEEL606	Digital Control Engineering Analysis and Design	3	0	0	3	3	Electrical Machines & Control
7	20EEEL607	Communication Engineering	3	0	0	3	3	Electronics & Embedded
8	20EEEL608	Electronic Product Design	3	0	0	3	3	Electronics & Embedded
9	20EEEL609	Industrial Data Communication	3	0	0	3	3	Computer Technology
10	20XXXXXX X	Digital Consumer Technology	3	0	0	3	3	Industrial & Management



Professional Elective-III

Sl No	Sub Code	Subject Name	L	T	P	Total	C	Stream
1	20EEEL701	Power Electronics for Renewable Energy Systems	3	0	0	3	3	Power & Energy
2	20EEEL702	Power Quality Studies	3	0	0	3	3	Power & Energy
3	20EEEL703	Energy Management and Auditing	3	0	0	3	3	Power & Energy
4	20EEEL704	Computer aided Design of Electrical Machines	3	0	0	3	3	Electrical Machines & Control
5	20EEEL705	Virtual Instrumentation with Labview	3	0	0	3	3	Electrical Machines & Control
6	20EEEL706	Micro Electro Mechanical Systems	3	0	0	3	3	Electrical Machines & Control
7	20EEEL707	Electro Magnetic Compatibility	3	0	0	3	3	Electronics & Embedded
8	20EEEL708	Nano technology	3	0	0	3	3	Electronics & Embedded
9	20XXXXXX X	Artificial Intelligence	3	0	0	3	3	Computer Technology
10	20EEEL709	Industrial Control And Automation	3	0	0	3	3	Industrial & Management



Professional Elective -IV

Sl No	Sub Code	Subject Name	L	T	P	Total	C	Stream
1	20EEEL 710	Power System Protection and Switch Gear	3	0	0	3	3	Power & Energy
2	20EEEL711	Restructured Power Systems	3	0	0	3	3	Power & Energy
3	20EEEL712	Energy Storage Technologies	3	0	0	3	3	Power & Energy
4	20EEEL713	Special Electrical Machines	3	0	0	3	3	Electrical Machines & Control
5	20EEEL714	Embedded Control of Electric Drives	3	0	0	3	3	Electrical Machines & Control
6	20EEEL715	Robotics and Control	3	0	0	3	3	Electrical Machines & Control
7	20EEEL716	Real Time Embedded Systems	3	0	0	3	3	Electronics & Embedded
8	20EEEL717	FPGA based system Design	3	0	0	3	3	Electronics & Embedded
9	20XXXXXXXX	Computer Architecture and Parallel Processing	3	0	0	3	3	Computer Technology
10	20XXXXXXXX	Industrial Management	3	0	0	3	3	Industrial & Management



Professional Elective-V

Sl No	Sub Code	Subject Name	L	T	P	Total	C	Stream
1	20EEEL801	FACTS and Custom power devices	3	0	0	3	3	Power & Energy
2	20EEEL802	Smart grid Technologies	3	0	0	3	3	Power & Energy
3	20EEEL803	EHVAC& EHVDC Power Transmission	3	0	0	3	3	Power & Energy
4	20EEEL804	Soft Computing Techniques for Electrical Engineers	3	0	0	3	3	Electrical Machines & Control
5	20EEEL805	Automotive Electrical and Electronics Systems	3	0	0	3	3	Electrical Machines & Control
6	20EEEL806	Control of Electric Vehicle	3	0	0	3	3	Electrical Machines & Control
7	20EEEL807	Advanced microprocessors	3	0	0	3	3	Electronics & Embedded
8	20EEPE808	High Speed Digital Design	3	0	0	3	3	Electronics & Embedded
9	20XXXXX XX	Fundamentals of Big Data Analytics	3	0	0	3	3	Computer Technology
10	20XXXXX XX	Work Ethics, Corporate Social Responsibility and Governance	3	0	0	3	3	Industrial & Management



Open Electives

S.No.	Course Code	Course Title	L	T	P	Total	C
1	20EE OE 901	Principles of Wind energy system	3	3	0	3	3
2	20EE OE 902	Introduction to MEMS Design	3	3	0	3	3
3	20EE OE 903	Basics of Energy Storage Technologies	3	3	0	3	3
4	20EE OE 904	Basic Concepts of SMPS and UPS	3	3	0	3	3
5	20EE OE 905	Solar energy appliances	3	3	0	3	3
6	20EE OE 906	Introduction to renewable energy systems	3	3	0	3	3
7	20EE OE 907	Fundamentals of power electronics	3	3	0	3	3
8	20EE OE 908	Introduction to Microcontroller	3	3	0	3	3
9	20EE OE 909	Fundamentals of Smart Grid	3	3	0	3	3
10	20EE OE 910	Basics of Programmable Logic Controllers	3	3	0	3	3



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SL NO	NAME	DESIGNATION	SIGNATURE
1	Dr.B.Priya	Professor/Electronics and Communication Engineering, Rajalakshmi Engineering College, Rajalakshmi Nagar,Thandalam, Chennai-602105	
2	Dr.Jeevananthan	Professor/Electrical and Electronics Engineering, Pondicherry Engineering College,Puducherry-605014.	
3	Dr.R.Bens Raj	Associate Professor, Department of Electrical Engineering, Annamalai University, Annamalai nagar-608002	
4	Dr.G.Swaminathan	Associate General Manager,Schneider Electric (R&D), Bangalore.	
5	Mr.S.Sujay Sudharsan	Executive Director Professional Elevators PVT Ltd Chennai.	
6	Dr.G.Prakash	Professor& Head of the Department, Department of Electrical and Electronics Engineering, Sri Sairam Institute of Technology, Chennai-44	
7	Dr.M.Jagadeesh Kumar	Professor, Department of Electrical and Electronics Engineering, Sri Sairam Institute of Technology, Chennai-44	
8	Mr.A.Anbazhagan	Associate Professor, Department of Electrical and Electronics Engineering, Sri Sairam Institute of Technology, Chennai-44	
9	Mrs.E.Maheswari	Associate Professor, Department of Electrical and Electronics Engineering, Sri Sairam Institute of Technology, Chennai-44	
10	Mrs.N.Shanthi	Assistant Professor, Department of Electrical and Electronics Engineering, Sri Sairam Institute of Technology, Chennai-44	

1.1.3 Courses focused on Employability, Entrepreneurship and Skill Development offered



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DEPARTMENT OF
MECHANICAL ENGINEERING

**REGULATIONS
2020**

Academic Year 2020-21 onwards

**AUTONOMOUS
CURRICULUM AND**

**SYLLABUS
I - VIII
SEMESTERS**

SRI SAIRAM INSTITUTE OF TECHNOLOGY



VISION

To be identified as a “Centre of Excellence” with high standards of Knowledge Dissemination and Research opportunities and to transform the students to imbibe qualities of technical expertise of international standards and high levels of ethical values, who in turn shall contribute to the advancement of society and human kind.



MISSION

We shall dedicate and commit ourselves to attain and maintain excellence in Technical Education through commitment and continuous improvement of infrastructure and equipment and provide an inspiring environment for Learning, Research and Innovation for our students to transform them into complete human beings with ethical and social values.



QUALITY POLICY

We at Sri Sai Ram Institute of Technology are committed to build a better nation through Quality Education with team spirit. Our students are enabled to excel in all values of Life and become Good Citizens. We continually improve the System, Infrastructure and Services to satisfy the Students, Parents, Industry and Society.

DEPARTMENT OF MECHANICAL ENGINEERING



VISION

Establish the department with high quality education and to create opportunities for research and development in the field of Mechanical engineering and to create innovative, entrepreneurial and successful mechanical engineers together with human values, and ethically strong to serve the society.



MISSION

The Department imparts high quality technical knowledge and provides research environment with well-established and continuously improving infrastructure and laboratories, to keep up with the development across the globe, while training the students successfully to establish themselves in the society through the social and ethical learning.

AUTONOMOUS CURRICULUM AND SYLLABI

Regulations 2020

SEMESTER I

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA101	Engineering Mathematics-I	3	1	0	4	4
2	20HSEN101	Technical English-I	3	0	0	3	3
3	20BSPH101	Engineering Physics	3	0	0	3	3
4	20BSCY101	Engineering Chemistry	3	0	0	3	3
5	20ESCS101	Problem solving and Programming in C	3	0	0	3	3
6	20ESGE101	Engineering Graphics	1	2	0	3	3
PRACTICAL							
7	20BSPL101	Physics and Chemistry Lab	0	0	3	3	1.5
8	20ESPL101	Programming in C lab	0	0	3	3	1.5
VALUE ADDITIONS - I							
9	20TPHS101	Skill Enhancement	0	0	2	2	1
10	20HSMG101	Personal Values	2	0	0	2	0
TOTAL						29	23

SEMESTER II

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA201	Engineering Mathematics-II	3	1	0	4	4
2	20HSEN201	Technical English-II	3	0	0	3	3
3	20ESIT201	Python Programming with Lab	3	0	2	5	4
4	20BSCY201	Environmental Science and Engineering	3	0	0	3	3
5	20ESEE201	Electrical Technology with Lab	3	0	2	5	4
6	20BSPH202	Physics of Materials	3	0	0	3	3
PRACTICAL							
7	20ESGE201	Engineering Practices Laboratory	0	0	3	3	1.5
VALUE ADDITIONS - II							
8	20TPHS201	Skill Enhancement	0	0	2	2	1
9	20HSMG201	Interpersonal Values	2	0	0	2	0
TOTAL						31	23.5

SEMESTER III

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20ESCE201	Engineering Mechanics	3	0	0	3	3
2	20MEPC301	Manufacturing Processes	3	0	0	3	3
3	20MEPC302	Engineering Thermodynamics	3	1	0	4	4
4	20MEPC303	Engineering Metallurgy	3	0	0	3	3
5	20BSMA303	Partial Differential Equations and Probability Theory	3	1	0	4	4
6	20CEPC306	Fluid Mechanics and Machinery	3	0	0	3	3
PRACTICAL							
7	20MEPL301	Manufacturing Processes Laboratory	0	0	3	3	1.5
8	20MEPL302	Computer Aided Drafting Laboratory	0	0	3	3	1.5
VALUE ADDITIONS - III							
9	20METE301	Live-in Lab I	0	0	2	2	1
10	20METP301	Skill Enhancement	0	0	2	2	1
TOTAL						27	25

SEMESTER IV

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20MEPC401	Measurement and Control Systems	3	0	0	3	3
2	20MEPC402	Metrology, Measurements and Computer Aided Inspection	3	0	0	3	3
3	20MEPC403	Computer Aided Design and Manufacturing	3	0	0	3	3
4	20MEPC404	Applied Thermal Sciences	3	0	0	3	3
5	20BSMA403	Statistics and Numerical Methods	3	1	0	4	4
6	20CEPC405	Strength of Materials	3	0	0	3	3
PRACTICAL							
7	20MEPL401	Metrology and Measurements Laboratory	0	0	3	3	1.5
8	20CEPL403	Strength of Materials and Fluid Mechanics & Machinery Laboratory	0	0	3	3	1.5
VALUE ADDITIONS - IV							
9	20METE401	Live-in Lab II	0	0	2	2	1
10	20METP401	Skill Enhancement	0	0	2	2	1
TOTAL						29	24

SEMESTER V

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20MEPC501	Automotive Systems	3	0	0	3	3
2	20MEPC502	Robotics	3	0	0	3	3
3	20MEPC503	Theory of Machines	3	0	0	3	3
4	20MEPC504	Design of Machine Elements	3	1	0	4	4
5	20XXELXXX	Professional Elective-I	3	0	0	3	3
PRACTICAL							
6	20MEPL501	3D Modeling and Computer Aided Manufacturing Laboratory	0	0	3	3	1.5
7	20MEPL502	Kinematics and Dynamics Laboratory	0	0	3	3	1.5
8	20HSPL501	Communication and Soft Skills Laboratory	0	0	2	2	1
9	20METE501	Live-in Lab III	0	0	4	4	2
VALUE ADDITIONS - V							
10	20METP501	Skill Enhancement	0	0	2	2	1
TOTAL						30	23

SEMESTER VI

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20MEPC601	Design of Transmission Systems	3	0	0	3	3
2	20MEPC602	Heat Transfer	3	0	0	3	3
3	20MEPC603	Mechatronics	3	0	0	3	3
4	20XXELXXX	Professional Elective-II	3	0	0	3	3
5	20XXOEXXX	Open Elective-I	3	0	0	3	3
PRACTICAL							
6	20MEPL601	Thermal Science Laboratory	0	0	3	3	1.5
7	20MEPL602	Mechatronics and Robotics Laboratory	0	0	3	3	1.5
8	20MEPJ601	Innovative Design and Fabrication Project	0	0	2	2	1
VALUE ADDITIONS - VI							
9	20METP601	Skill Enhancement	0	0	2	2	1
10	20MGMC301	Constitution of India	2	0	0	2	0
TOTAL						27	20

SEMESTER VII

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20HSMG601	Principles of Engineering Management	3	0	0	3	3
2	20MEPC701	Finite Element Analysis	3	0	0	3	3
3	20MEPW701	3D Printing and Sustainable Design with Lab	3	0	2	5	4
4	20XXELXXX	Professional Elective-III	3	0	0	3	3
5	20XXOEXXX	Open Elective-II	3	0	0	3	3
PRACTICAL							
6	20MEPL701	Computer Aided Simulation and Analysis Laboratory	0	0	3	3	1.5
7	20MEPJ701	Project Phase-I	0	0	4	4	2
VALUE ADDITIONS - VII							
8	20METP701	Skill Enhancement	0	0	2	2	1
TOTAL						26	20.5

SEMESTER VIII

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20XXELXXX	Professional Elective - IV	3	0	0	3	3
PRACTICAL							
2	20MEPJ801	Project Phase - II	0	0	8	8	4
TOTAL						11	7

CREDIT DISTRIBUTION

Category	BS	ES	HS	EL	PC+PL	PW	OE	TE	PJ	TP	IS	MC	TOTAL
Credit	29.5	10	20	12	66.5	4	6	4	7	7	3	Y	169
Percentage	17.46	5.92	11.83	7.10	39.35	2.37	3.55	2.37	4.14	4.14	1.78	-	100

*IS-Internship

PROFESSIONAL ELECTIVES - I

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT
			L	T	P		
1	20MEEL501	Gas Dynamics and Jet Propulsion	3	0	0	3	3
2	20MEEL502	Power Plant Technology	3	0	0	3	3
3	20MEEL503	Alternative Fuels	3	0	0	3	3
4	20MEEL504	Thermal Environmental Engineering	3	0	0	3	3
5	20MEEL505	Environmental & Energy Management	3	0	0	3	3
6	20MEEL506	Applied Hydraulics and Pneumatics	3	0	0	3	3
7	20MEEL507	Robot Kinematics And Dynamics	3	0	0	3	3
8	20MEEL508	Mechanical Behaviour of Materials	3	0	0	3	3
9	20MEEL509	Product Design and Development	3	0	0	3	3
10	20MEEL510	Non Traditional Machining Techniques	3	0	0	3	3
11	20MEEL511	Material Joining Techniques	3	0	0	3	3
12	20MEEL512	Precision Manufacturing	3	0	0	3	3
13	20MEEL513	Metal Additive Manufacturing Processes	3	0	0	3	3
14	20MEEL514	Process Planning and Cost Estimation	3	0	0	3	3
15	20MEEL515	Industrial Engineering	3	0	0	3	3
16	20MGEL801	Intellectual Property Rights	3	0	0	3	3
17	20HSMG301	Professional Ethics and Values	3	0	0	3	3

PROFESSIONAL ELECTIVES - II

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT
			L	T	P		
1	20MEEL601	Renewable Energy Sources	3	0	0	3	3
2	20MEEL602	Turbo Machines	3	0	0	3	3
3	20MEEL603	Design of Pressure Vessels and Piping	3	0	0	3	3
4	20MEEL604	Energy Efficiency and Sustainability	3	0	0	3	3
5	20MEEL605	Energy Conservation in Industries	3	0	0	3	3
6	20MEEL606	IOT for Mechanical & Manufacturing Industry	3	0	0	3	3
7	20MEEL607	Programming for Robotics	3	0	0	3	3
8	20MEEL608	Automotive Infotonics	3	0	0	3	3
9	20MEEL609	Product Life Cycle Management	3	0	0	3	3
10	20MEEL610	Micro Electro Mechanical Systems (MEMS)	3	0	0	3	3
11	20MEEL611	Non Destructive Testing and Evaluation	3	0	0	3	3
12	20MEEL612	Materials Characterization	3	0	0	3	3
13	20MEEL613	Green Manufacturing Systems and Strategies	3	0	0	3	3
14	20MEEL614	Lean and Agile Manufacturing	3	0	0	3	3
15	20MEEL615	Logistics & Supply Chain Management	3	0	0	3	3
16	20MGEL601	Total Quality Management	3	0	0	3	3

PROFESSIONAL ELECTIVES - III

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT
			L	T	P		
1	20MEEL701	Computational Fluid Dynamics	3	0	0	3	3
2	20MEEL702	Refrigeration, Air Conditioning and Cryogenic Systems	3	0	0	3	3
3	20MEEL703	Biogas Engineering	3	0	0	3	3
4	20MEEL704	Energy Conservation and Waste Heat Recovery	3	0	0	3	3
5	20MEEL705	Hybrid Vehicles	3	0	0	3	3
6	20MEEL706	Computer Integrated Manufacturing Systems	3	0	0	3	3
7	20MEEL707	Industrial Robotics And Material Handling Systems	3	0	0	3	3
8	20MEEL708	Artificial Intelligence for Robotics	3	0	0	3	3
9	20MEEL709	Design for Manufacturing	3	0	0	3	3
10	20MEEL710	Virtual Prototyping	3	0	0	3	3
11	20MEEL711	Tool Design	3	0	0	3	3
12	20MEEL712	Composite Materials and Mechanics	3	0	0	3	3
13	20MEEL713	Wear, Corrosion and Surface Protection of Materials	3	0	0	3	3
14	20MEEL714	Project Planning and Management	3	0	0	3	3
15	20MEEL715	Six Sigma Quality	3	0	0	3	3
16	20MGEL701	Economics for Engineers	3	0	0	3	3
17	20HSMG601	Statistical Quality Control and Reliability Engineering	3	0	0	3	3

PROFESSIONAL ELECTIVES - IV

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT
			L	T	P		
1	20MEEL801	Advanced Internal Combustion Engines	3	0	0	3	3
2	20MEEL802	Microrobotics	3	0	0	3	3
3	20MEEL803	Smart Manufacturing	3	0	0	3	3
4	20MEEL804	Polymer Materials and their Processing	3	0	0	3	3
5	20MEEL805	Industrial Safety and Maintenance Engineering	3	0	0	3	3
6	20MEEL806	Theory of Vibrations and Noise Control	3	0	0	3	3
7	20MEEL807	Systems Engineering	3	0	0	3	3
8	20MEEL808	Machine Vision Systems & Imaging Techniques	3	0	0	3	3
9	20MEEL809	Fatigue Design & Analysis	3	0	0	3	3
10	20MGEL703	Entrepreneurship Development	3	0	0	3	3

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- PEO1** To promote successful career in engineering and technological organizations and in other industries with the emphasis in the fields of Design, Engineering, Manufacturing, Service and R&D.
- PEO2** To prepare students for higher studies and research in institutes of national importance and developed countries by providing strong fundamentals in basic sciences and applying them in engineering.
- PEO3** Entrepreneurial skill and self-employment in the program adopted.
- PEO4** Working with ethical values in diverse culture and adherence to Indian culture without compromise in the profession is promoted.
- PEO5** Institutional program prepares for total development of personality encouraging cultural events, sports, social activities etc.

PROGRAM SPECIFIC OUTCOMES (PSOs)

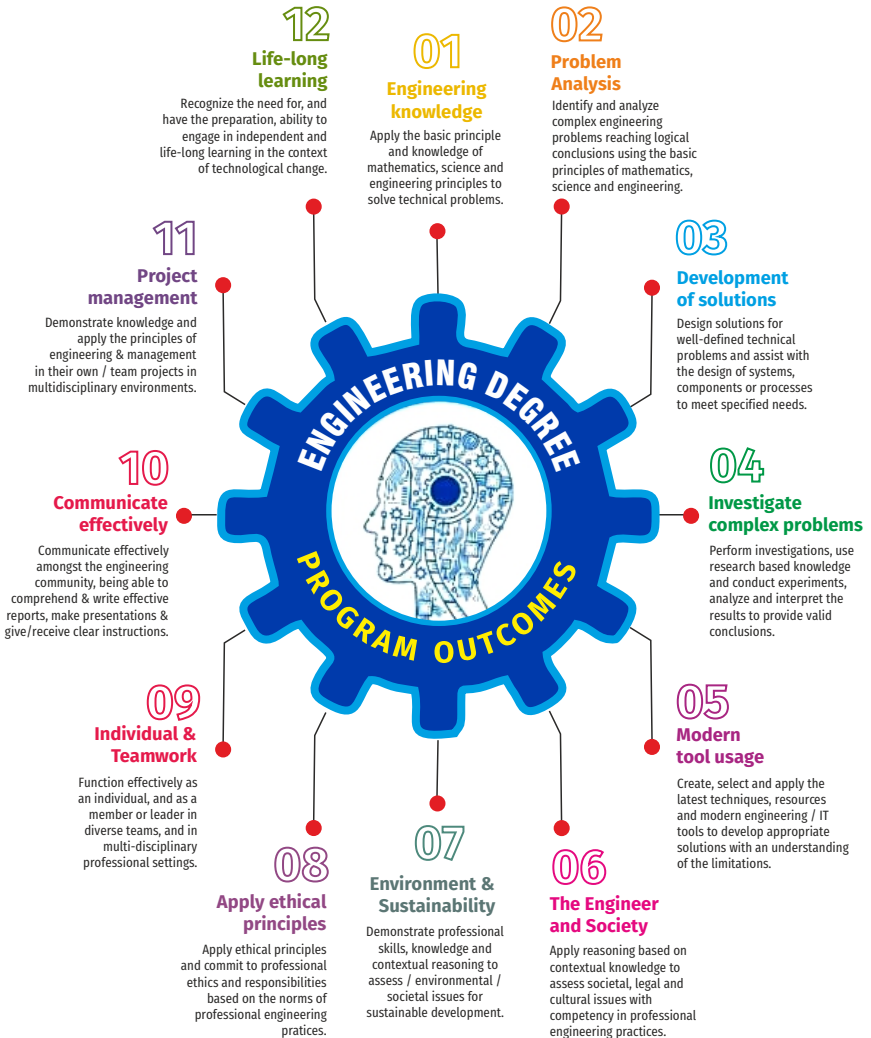
- PSO1** To impart sound fundamental of basic sciences viz. mathematics, physics, chemistry so as to apply them for engineering problem analysis, and prepare students for higher education and research in the chosen field.
- PSO2** To achieve ability to gather and synthesis engineering data with basic knowledge of engineering and prepare students for successful career in industry, while generating thirst for knowledge and lifelong learning.

COMPONENTS OF THE CURRICULUM (COC)

Course Component	Curriculum Content (% of total number of credits of the program)	Total number of contact hours	Total Number of credits
Basic Sciences(BS)	17.46	31	29.5
Engineering Sciences(ES)	11.83	25	20
Humanities and Social Sciences (HS)	5.92	12	10
Professional Electives(EL)	7.10	12	12
Program Core+Program Lab (PC+PL)	39.35	80	66.5
Program theory with Lab (PW)	2.37	5	4
Open Electives (OE)	3.55	6	6
Talent Enhancement (TE)	2.37	8	4
Project (PJ)	4.14	14	7
Training & Placement (TP)	4.14	14	7
Internships/Seminars (IS)	1.78	-	3
Mandatory Courses (MC)	NA	06	NA
Total number of Credits		213	169

PROGRAMME OUTCOMES(POs)

PROGRAM OUTCOME REPRESENTS THE KNOWLEDGE, SKILLS AND ATTITUDES THAT THE STUDENTS WOULD BE EXPECTED TO HAVE AT THE END OF THE 4 YEAR ENGINEERING DEGREE PROGRAM





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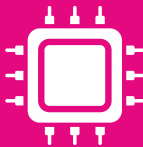
INSTITUTE OF TECHNOLOGY

An Autonomous Institution

West Tambaram, Chennai - 44

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Approved by AICTE, New Delhi
Affiliated to Anna University



DEPARTMENT OF
**ELECTRICAL AND ELECTRONICS
ENGINEERING**

**REGULATIONS
2020**

Academic Year 2020-21 onwards

**AUTONOMOUS
CURRICULUM AND**

**SYLLABUS
I - VIII
SEMESTERS**

SRI SAIRAM INSTITUTE OF TECHNOLOGY



VISION

To be identified as a “Centre of Excellence” with high standards of Knowledge Dissemination and Research opportunities and to transform the students to imbibe qualities of technical expertise of international standards and high levels of ethical values, who in turn shall contribute to the advancement of society and human kind.



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We shall dedicate and commit ourselves to attain and maintain excellence in Technical Education through commitment and continuous improvement of infrastructure and equipment and provide an inspiring environment for Learning, Research and Innovation for our students to transform them into complete human beings with ethical and social values.



QUALITY POLICY

We at Sri Sai Ram Institute of Technology are committed to build a better nation through Quality Education with team spirit. Our students are enabled to excel in all values of Life and become Good Citizens. We continually improve the System, Infrastructure and Services to satisfy the Students, Parents, Industry and Society.

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING



VISION

To become a front-runner, the department of Electrical and Electronics Engineering brings out competent engineers, innovators, researchers with human and ethical values, thereby contributing value to the knowledge based economy and society.



MISSION

The Electrical and Electronics Engineering department strives to develop talented professionals by providing high quality and effective education with commitment in the field of electrical engineering and an inspiring environment for innovation, research ideas to fulfill the needs of the public in an ethical and responsible manner. The department invokes the desire and ability of life-long learning, team spirit and leadership skills for pursuing successful career in electrical engineering

AUTONOMOUS CURRICULA AND SYLLABI Regulations 2020

SEMESTER I

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA101	Engineering Mathematics-I	3	1	0	4	4
2	20HSEN101	Technical English-I	3	0	0	3	3
3	20BSPH101	Engineering Physics	3	0	0	3	3
4	20BSCY101	Engineering Chemistry	3	0	0	3	3
5	20ESCS101	Problem Solving and Programming in C	3	0	0	3	3
6	20ESGE101	Engineering Graphics	1	2	0	3	3
PRACTICAL							
7	20BSPL101	Physics and Chemistry Laboratory	0	0	3	3	1.5
8	20ESPL101	Programming in C Laboratory	0	0	3	3	1.5
VALUE ADDITIONS - I							
9	20TPHS101	Skill Enhancement	0	0	2	2	1
10	20HSMG101	Personal Values	2	0	0	2	0
TOTAL						29	23

SEMESTER II

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA201	Engineering Mathematics -II	3	1	0	4	4
2	20HSEN201	Technical English - II	3	0	0	3	3
3	20ESIT201	Python Programming with Laboratory	3	0	2	5	4
4	20BSPH201	Physics of Electron Devices	3	0	0	3	3
5	20BSCY201	Environmental Science and Engineering	3	0	0	3	3
6	20EEPC201	Electric Circuit Analysis	2	1	0	3	3
PRACTICAL							
7	20ESGE201	Engineering Practices Laboratory	0	0	3	3	1.5
8	20EEPL201	Electric Circuits and Simulation Laboratory	0	0	3	3	1.5
VALUE ADDITIONS - II							
9	20TPHS201	Skill Enhancement	0	0	2	2	1
10	20HSMG201	Interpersonal Values	2	0	0	2	0
TOTAL						31	24

SEMESTER III

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20EEPC301	Analog Electronics	3	0	0	3	3
2	20EEPC302	DC Machines and Transformers	2	1	0	3	3
3	20EEPC303	Electromagnetic Theory	3	1	0	4	4
4	20EEPC304	Digital Logic Circuits	3	0	0	3	3
5	20BSMA301	Linear Algebra, Partial Differential Equations and Transforms.	3	1	0	4	4
PRACTICAL							
6	20EEPL301	Analog and Digital Circuits Laboratory	0	0	3	3	1.5
7	20EEPL302	DC Machines & Transformers Laboratory	0	0	3	3	1.5
8	20EETE301	Live-in-Lab – I	0	0	2	2	1
VALUE ADDITIONS - III							
9	20EETP301	Skill Enhancement	0	0	2	2	1
10	20MGMC301	Constitution of India	2	0	0	2	0
TOTAL						29	22

SEMESTER IV

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20EEPC401	Synchronous and Induction Machines	2	1	0	3	3
2	20EEPC402	Transmission and Distribution	3	0	0	3	3
3	20EEPC403	Measurements and Instrumentation	3	0	0	3	3
4	20EEPC404	Control Engineering	3	1	0	4	4
5	20BSMA403	Statistics and Numerical Methods	3	1	0	4	4
PRACTICAL							
6	20EEPL401	Synchronous & Induction Machines Lab	0	0	3	3	1.5
7	20EEPL402	Control Engineering & Instrumentation Lab	0	0	3	3	1.5
8	20EETE401	Live-in-Lab II	0	0	2	2	1
VALUE ADDITIONS - IV							
9	20EETP401	Skill Enhancement	0	0	2	2	1
TOTAL						27	22

SEMESTER V

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20EEPC501	Power System Analysis	3	0	0	3	3
2	20EEPC502	Power Electronics	3	0	0	3	3
3	20EEPC503	Microprocessor and Microcontroller	2	1	0	3	3
4	20XXELXXX	Professional Elective-I	3	0	0	3	3
5	20XXOEXXX	Open Elective –I	3	0	0	3	3
PRACTICAL							
6	20EEPL501	Power Electronics Lab	0	0	3	3	1.5
7.	20EEPL502	Microprocessor & Microcontroller Lab	0	0	3	3	1.5
8.	20HSP501	Communication and Soft Skills Lab	0	0	2	2	1
VALUE ADDITIONS - V							
9	20EETE501	Live-in-Lab III	0	0	4	4	2
10	20EETP501	Skill Enhancement	0	0	2	2	1
TOTAL						29	22

SEMESTER VI

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20EEPC601	Solid State Drives and Control	3	0	0	3	3
2	20EEPC602	Power System Operation and Control	3	0	0	3	3
3	20EEPW601	Embedded Systems & IoT with Laboratory	3	0	2	5	4
4	20ITPC301	Data Structures	3	0	0	3	3
5	20XXELXXX	Professional Elective-II	3	0	0	3	3
6	20XXOEXXX	Open Elective – II	3	0	0	3	3
PRACTICAL							
7	20EEPL601	Power System Simulation Laboratory	0	0	3	3	1.5
8	20ITPL301	Data Structures Laboratory	0	0	3	3	1.5
9	20EEPJ601	Innovative Design Project	0	0	2	2	1
VALUE ADDITIONS - VI							
10	20EETP601	Skill Enhancement	0	0	2	2	1
TOTAL						30	24

SEMESTER VII

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20EEPC701	Distributed Generation and Microgrid	3	0	0	3	3
2	20EEPC702	Electric Vehicles	3	0	0	3	3
3	20XXELXXX	Professional Elective-III	3	0	0	3	3
4	20XXELXXX	Professional Elective-IV	3	0	0	3	3
5	20HSMG601	Principles of Engineering Management	3	0	0	3	3
PRACTICAL							
6	20EEPL701	Renewable Energy Laboratory	0	0	4	4	2
7	20EEPJ701	Project Phase - I	0	0	4	4	2
VALUE ADDITIONS - VII							
8	20EETP701	Skill Enhancement	0	0	2	2	1
TOTAL						25	20

SEMESTER VIII

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20XXELXXX	Professional Elective - V	3	0	0	3	3
PRACTICAL							
2	20EEPJ801	Project Phase - II	0	0	8	8	4
TOTAL						11	7

CREDIT DISTRIBUTION

Category	BS	ES	HS	EL	PC+PL	PW	OE	TE	PJ	TP	IS	MC	TOTAL
Credit	29.5	13	10	15	68.5	4	6	4	7	7	3	Y	167
Percentage	17.7	7.8	6.0	9.0	41.0	2.4	3.6	2.4	4.2	4.2	1.8	-	

*IS-Internship

PROFESSIONAL ELECTIVES - I

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			CREDIT	STREAM
			L	T	P		
1.	20EEEL501	Electrical Energy Generation Systems	3	0	0	3	Power & Energy
2.	20EEEL502	Power Engineering & Instrumentation	3	0	0	3	Power & Energy
3.	20EEEL503	Solar and Wind Energy Systems	3	0	0	3	Power & Energy
4.	20EEEL504	Design of Electrical Machines	3	0	0	3	Electrical Machines & Control
5.	20EEEL505	Transducer Engineering	3	0	0	3	Electrical Machines & Control
6.	20EEEL506	Electrical Engineering Materials	3	0	0	3	Electrical Machines & Control
7.	20EEEL507	Discrete - Time Signal Processing	3	0	0	3	Electronics & Embedded
8.	20EEEL508	Arduino and Raspberry pi Based System Design	3	0	0	3	Electronics & Embedded
9.	20EEEL509	Internet of Things for Electrical Engineering	3	0	0	3	Computer Technology
10.	20EEEL510	Industrial Safety	3	0	0	3	Industrial & Management

PROFESSIONAL ELECTIVES - II

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			CREDIT	STREAM
			L	T	P		
1	20EEEL601	Power System Transients	3	0	0	3	Power & Energy
2	20EEEL602	High Voltage Engineering	3	0	0	3	Power & Energy
3	20EEEL603	Electric Energy Utilization and Conservation	3	0	0	3	Power & Energy
4	20EEEL604	Modeling and Analysis of Electrical Machines	3	0	0	3	Electrical Machines & Control
5	20EEEL605	Advanced Control Systems	3	0	0	3	Electrical Machines & Control
6	20EEEL606	Digital Control Engineering Analysis and Design	3	0	0	3	Electrical Machines & Control
7	20ESEC307	Communication Engineering	3	0	0	3	Electronics & Embedded
8	20EEEL607	Electronic Product Design	3	0	0	3	Electronics & Embedded
9	20EEEL608	Industrial Data Communication	3	0	0	3	Computer Technology
10	20EEEL609	Digital Consumer Technology	3	0	0	3	Industrial & Management

PROFESSIONAL ELECTIVES - III

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			CREDIT	STREAM
			L	T	P		
1	20EEEL701	Power Electronics for Renewable Energy Systems	3	0	0	3	Power & Energy
2	20EEEL702	Power Quality	3	0	0	3	Power & Energy
3	20EEEL703	Energy Management and Auditing	3	0	0	3	Power & Energy
4	20EEEL704	Computer Aided Design of Electrical Machines	3	0	0	3	Electrical Machines & Control
5	20EEEL705	Medical Instrumentation	3	0	0	3	Electrical Machines & Control
6	20EEEL706	Microelectromechanical Systems	3	0	0	3	Electrical Machines & Control
7	20EEEL707	Electromagnetic Compatibility	3	0	0	3	Electronics & Embedded
8	20EEEL708	Nano Technology	3	0	0	3	Electronics & Embedded
9	20CSPC601	Artificial Intelligence	3	0	0	3	Computer Technology
10	20EEEL709	Industrial Control and Automation	3	0	0	3	Industrial & Management

PROFESSIONAL ELECTIVES - IV

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			CREDIT	STREAM
			L	T	P		
1	20EEEL 710	Power System Protection and Switchgear	3	0	0	3	Power & Energy
2	20EEEL711	Restructured Power Systems	3	0	0	3	Power & Energy
3	20EEEL712	Energy Storage Technologies	3	0	0	3	Power & Energy
4	20EEEL713	Special Electrical Machines	3	0	0	3	Electrical Machines & Control
5	20EEEL714	Embedded Control of Electric Drives	3	0	0	3	Electrical Machines & Control
6	20EEEL715	Robotics and Control	3	0	0	3	Electrical Machines & Control
7	20EEEL716	Real Time Embedded Systems	3	0	0	3	Electronics & Embedded
8	20EEEL717	FPGA Based System Design	3	0	0	3	Electronics & Embedded
9	20ITPC303	Computer Organization and Architecture	3	0	0	3	Computer Technology
10	20EEEL718	Industrial Management	3	0	0	3	Industrial & Management

PROFESSIONAL ELECTIVES - V

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			CREDIT	STREAM
			L	T	P		
1	20EEEL801	FACTS and Custom Power Devices	3	0	0	3	Power & Energy
2	20EEEL802	Smart Grid Technologies	3	0	0	3	Power & Energy
3	20EEEL803	EHVAC& EHVDC Power Transmission	3	0	0	3	Power & Energy
4	20EEEL804	Soft Computing Techniques for Electrical Engineers	3	0	0	3	Electrical Machines & Control
5	20EEEL805	Automotive Electrical and Electronics Systems	3	0	0	3	Electrical Machines & Control
6	20EEEL806	Control of Electric Vehicle	3	0	0	3	Electrical Machines & Control
7	20EEEL807	Advanced Microprocessors	3	0	0	3	Electronics & Embedded
8	20EEPE808	High Speed Digital Design	3	0	0	3	Electronics & Embedded
9	20EEEL809	Big Data Analytics for Smart Grid	3	0	0	3	Computer Technology
10	20EEEL810	Work Ethics, Corporate Social Responsibility and Governance	3	0	0	3	Industrial & Management

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- PEO1** Graduates are prepared to gain sound foundation in mathematical, scientific and engineering fundamentals necessary to analyze, formulate and solve electrical engineering problems.
- PEO2** Graduates are employed to function effectively as an individual, as a team member and as a leader with analytical skills to meet the needs of electrical field.
- PEO3** Graduates are motivated to understand the importance of life-long learning and professional development with the background that allows in pursuing advanced studies in electrical and electronics engineering or related fields.
- PEO4** Graduates are equipped with the knowledge of electrical & electronics engineering in core as well as multidisciplinary areas in innovative, dynamic and challenging environment for the research based teamwork.
- PEO5** Graduates are trained to possess knowledge to excel in the operation and maintenance of electrical systems in various industries.

PROGRAM SPECIFIC OUTCOMES (PSOs)

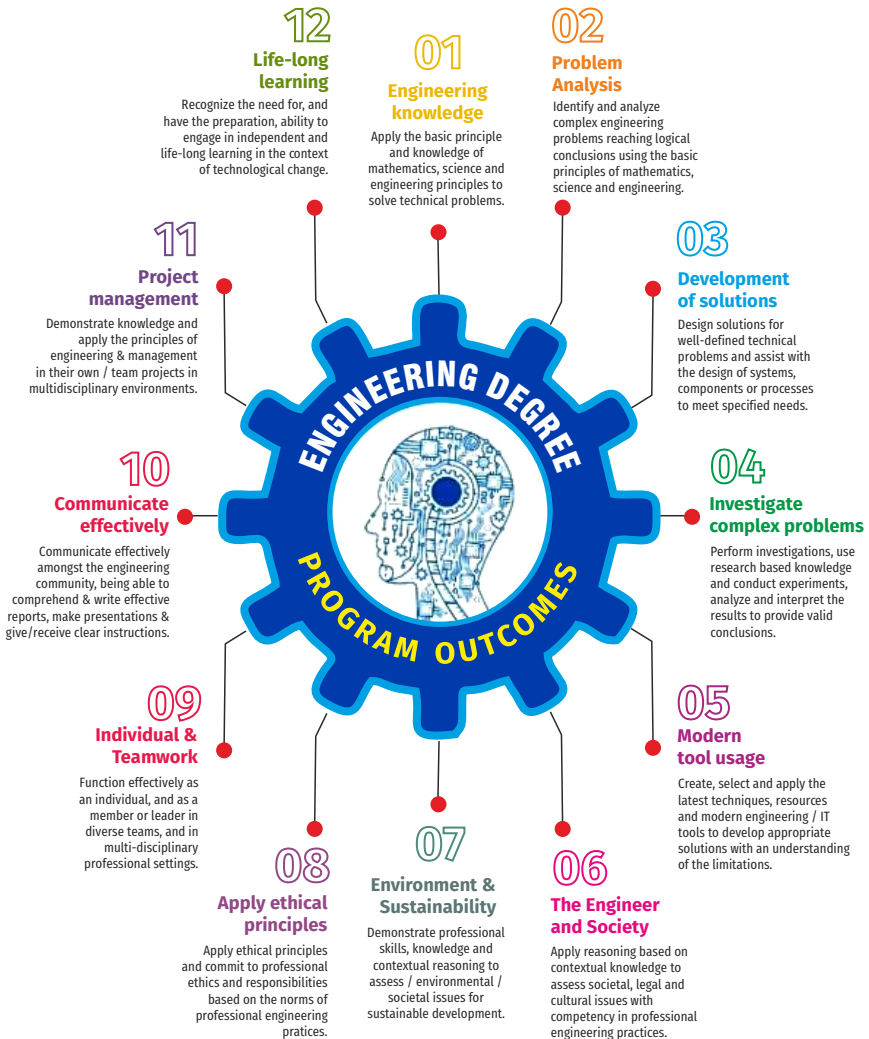
- PSO1** Capable to acquire knowledge on use of modern engineering tools and equipments to analyze problems necessary for electrical engineering practice
- PSO2** Providing engineers with contemporary knowledge about electrical engineering and skills needed to fulfill the needs of society.

COMPONENTS OF THE CURRICULUM (COC)

Course Component	Curriculum Content (% of total number of credits of the program)	Total number of contact hours	Total Number of credits
Basic Sciences(BS)	17.7	31	29.5
Engineering Sciences(ES)	7.8	17	13
Humanities and Social Sciences (HS)	6.0	15	10
Professional Electives(EL)	9.0	15	15
Program Core+Program Lab (PC+PL)	41.0	84	68.5
Program theory with Lab (PW)	2.4	5	4
Open Electives (OE)	3.6	06	6
Talent Enhancement (TE)	2.4	08	4
Project (PJ)	4.2	14	7
Training & Placement (TP)	4.2	14	7
Internships/Seminars (IS)	1.8	-	3
Mandatory Courses (MC)	NA	02	NA
Total number of Credits		211	167

PROGRAMME OUTCOMES(POs)

PROGRAM OUTCOME REPRESENTS THE KNOWLEDGE, SKILLS AND ATTITUDES THAT THE STUDENTS WOULD BE EXPECTED TO HAVE AT THE END OF THE 4 YEAR ENGINEERING DEGREE PROGRAM





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INSTITUTE OF TECHNOLOGY

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**DEPARTMENT OF
INFORMATION
TECHNOLOGY**

**REGULATIONS
2020**

Academic Year 2020-21 onwards

**AUTONOMOUS
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DEPARTMENT OF INFORMATION TECHNOLOGY



VISION

To accomplish excellence in teaching, learning and research in Information and Communication that responds swiftly to the challenges of the industry and society.



MISSION

We shall devote ourselves to provide quality technical education with contemporary technologies through state-of-art research facilities and inspiring learning ambience to comprehend and promote innovation and research in Information and Communication. Also, to associate with diverse organizations to strengthen industry-academia relationships, to produce responsible intellectuals and researchers.

AUTONOMOUS CURRICULUM AND SYLLABI

Regulations 2020

SEMESTER I

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA101	Engineering Mathematics-I	3	1	0	4	4
2	20HSEN101	Technical English-I	3	0	0	3	3
3	20BSPH101	Engineering Physics	3	0	0	3	3
4	20BSCY101	Engineering Chemistry	3	0	0	3	3
5	20ESCS101	Problem solving and Programming in C	3	0	0	3	3
6	20ESGE101	Engineering Graphics	1	2	0	3	3
PRACTICAL							
7	20BSPL101	Physics and Chemistry Lab	0	0	3	3	1.5
8	20ESPL101	Programming in C lab	0	0	3	3	1.5
VALUE ADDITIONS - I							
9	20TPHS101	Skill Enhancement	0	0	2	2	1
10	20HSMG101	Personal Values	2	0	0	2	0
TOTAL						29	23

SEMESTER II

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA204	Discrete Structures	3	1	0	4	4
2	20HSEN201	Technical English - II	3	0	0	3	3
3	20BSPH203	Physics for Information Science	3	0	0	3	3
4	20BSCY201	Environmental Science and Engineering	3	0	0	3	3
5	20ESIT202	Python Programming	3	0	0	3	3
6	20ESIT203	Digital Principles and System Design	2	1	0	3	3
PRACTICAL							
7	20ESGE201	Engineering Practices Lab	0	0	3	3	1.5
8	20ESPL201	Python Programming Laboratory	0	0	3	3	1.5
9	20ESPL202	Digital Laboratory	0	0	3	3	1.5
VALUE ADDITIONS - II							
10	20TPHS201	Skill Enhancement	0	0	2	2	1
11	20HSMG201	Interpersonal Values	2	0	0	2	0
TOTAL						32	24.5

SEMESTER III

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA304	Statistics and Linear Algebra	3	1	0	4	4
2	20ITPC301	Data Structures	3	0	0	3	3
3	20CSPC301	Object Oriented Programming	2	1	0	3	3
4	20ITPC302	Software Engineering	3	0	0	3	3
5	20ITPC303	Computer Organization and Architecture	3	0	0	3	3
6	20ESEC301	Communication Engineering	3	0	0	3	3
PRACTICAL							
7	20ITPL301	Data Structures Laboratory	0	0	3	3	1.5
8	20CSPL301	Object Oriented Programming Laboratory	0	0	3	3	1.5
9	20ITTE301	Live-in-Lab – 1	0	0	2	2	1
VALUE ADDITIONS - III							
8	20ITTP301	Skill Enhancement	0	0	2	2	1
9	20MGMC301	Constitution of India	2	0	0	2	0
TOTAL						31	24

SEMESTER IV

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA402	Probability and queuing Theory	3	1	0	4	4
2	20CSPC402	Database Management Systems	3	0	0	3	3
3	20ITPC401	Design and Analysis of Algorithms	2	1	0	3	3
4	20CSPC401	Operating Systems	3	0	0	3	3
5	20CSPW401	Computer Networks with Laboratory	3	0	2	5	4
PRACTICAL							
6	20CSPL402	Database Management Systems Laboratory	0	0	3	3	1.5
7	20CSPL401	Operating Systems Laboratory	0	0	3	3	1.5
8	20ITTE401	Live-in-Lab 2	0	0	2	2	1
VALUE ADDITIONS - IV							
9	20ITTP401	Skill Enhancement	0	0	2	2	1
TOTAL						28	22

SEMESTER V

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20ITPW501	Statistical Analysis using R Programming with Laboratory	3	0	2	5	4
2	20ITPW502	Object Oriented Analysis and Design with Laboratory	3	0	2	5	4
3	20ITPC501	Web Technology	3	0	0	3	3
4	20ITPC502	Big Data Essentials	3	0	0	3	3
5	20ESEC502	Microprocessors and Microcontrollers	3	0	0	3	3
PRACTICAL							
6	20ITPL501	Web Technology Laboratory	0	0	4	4	2
7	20ESPL501	Microprocessors & Microcontrollers Laboratory	0	0	3	3	1.5
8	20ITTE501	Live-in-Lab III	0	0	4	4	2
VALUE ADDITIONS - V							
9	20ITTP501	Skill Enhancement	0	0	2	2	1
TOTAL						32	23.5

SEMESTER VI

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20CSPC601	Artificial Intelligence	3	0	0	3	3
2	20ITPC601	Cloud Computing and Virtualization	3	0	0	3	3
3	20HSMG601	Principles of Engineering Management	3	0	0	3	3
4	20XXELXXX	Professional Elective - I	3	0	0	3	3
5	20XXOEXXX	Open Elective - I	3	0	0	3	3
PRACTICAL							
6	20HSPL501	Communication and Soft Skills Lab	0	0	2	2	1
7	20ITPL602	Cloud Computing & Virtualization Laboratory	0	0	3	3	1.5
8	20CSPL601	Artificial Intelligence Laboratory	0	0	3	3	1.5
9	20ITPJ601	Innovative Design Project	0	0	2	2	1
VALUE ADDITIONS - VI							
10	20ITTP601	Skill Enhancement	0	0	2	2	1
TOTAL						27	21

SEMESTER VII

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20ITPC701	Cryptography and Network Security	3	0	0	3	3
2	20ITPC702	Data Science with Machine Learning	3	1	0	4	4
3	20XXELXXX	Professional Elective II	3	0	0	3	3
4	20XXELXXX	Professional Elective III	3	0	0	3	3
5	20XXOEXXX	Open Elective - II	3	0	0	3	3
PRACTICAL							
6	20ITPL701	Cryptography and Network Security Lab	0	0	3	3	1.5
7	20ITPL702	Data Science Laboratory	0	0	3	3	1.5
8	20ITPJ701	Project Phase - I	0	0	4	4	2
VALUE ADDITIONS - VII							
9	20ITTP701	Skill Enhancement	0	0	2	2	1
TOTAL						28	22

SEMESTER VIII

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20XXELXXX	Professional Elective - IV	3	0	0	3	3
PRACTICAL							
2	20ITPJ801	Project Phase - II	3	0	0	8	4
TOTAL						11	7

CREDIT DISTRIBUTION

Category	BS	ES	HS	EL	PC+PL	PW	OE	TE	PJ	TP	IS	MC	TOTAL
Credit	29.5	25.5	10	12	54	12	6	4	7	7	3	Y	170
Percentage	17.4	15.0	5.9	7.0	31.7	7.0	3.5	2.3	4.1	4.1	1.7	-	

*IS-Internship

PROFESSIONAL ELECTIVES - I

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20ITEL601	Software Testing	3	0	0	3	3	Computing & Infor. Systems
2	20ITEL602	Compiler Design	3	0	0	3	3	Computing & Infor. Systems
3	20ITEL603	Cyber Security and Forensics	3	0	0	3	3	Data Analytics & Security
4	20ITEL604	Network Programming Protocols and Standards	3	0	0	3	3	Cloud Computing
5	20CSEL501	Data Warehousing and Data Mining	3	0	0	3	3	AI & Machine Learning
6	20ITEL605	Visualization Techniques	3	0	0	3	3	Data Analytics & Security
7	20ITEL606	Mobile Application Development with Laboratory	2	0	1	3	3	Internet of Things
8	20ITEL607	Embedded Systems	3	0	0	3	3	Internet of Things
9	20ITEL608	Fundamentals of Edge and Soft Computing	3	0	0	3	3	AI & Machine Learning
10	20ITEL609	NoSQL Database Techniques	3	0	0	3	3	Cloud Computing
11	20MGEL501	Intellectual Property Rights	3	0	0	3	3	Management

PROFESSIONAL ELECTIVES - II

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20ITEL701	C# and .Net Programming with Laboratory	2	0	1	3	3	Computing & Information Systems
2	20ITEL702	Wireless Ad hoc and Sensor Networks	3	0	0	3	3	Internet of Things
3	20ITEL703	Information Storage and Management	3	0	0	3	3	Cloud Computing
4	20ITEL704	Fundamentals of block chain technology with Laboratory	3	0	0	3	3	Data Analytics & Security
5	20ITEL705	Applied Machine Learning	3	0	0	3	3	AI Machine Learning
6	20CSEL703	Information Retrieval Techniques	3	0	0	3	3	Data Analytics & Security
7	20CSEL701	Social Network Analysis	3	0	0	3	3	AI & Machine Learning
8	20ITEL706	Computer Graphics and Multimedia	3	0	0	3	3	Computing & Information Systems
9	20ITEL707	Robotic Process Automation	3	0	0	3	3	Internet of Things
10	20ITEL708	Full Stack Software Development	3	0	0	3	3	Cloud Computing
11	20MGEL601	Total Quality Management	3	0	0	3	3	Management

PROFESSIONAL ELECTIVES - III

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20MEPC702	Robotics and Applications	3	0	0	3	3	Internet of Things
2	20ITEL709	Internet of Things	3	0	0	3	3	Internet of Things
3	20ITEL710	Service Oriented Architecture	3	0	0	3	3	Cloud Computing
4	20CSEL704	Natural Language Processing	3	0	0	3	3	AI & Machine Learning
5	20CSEL802	Deep Learning Principles & Practices	3	0	0	3	3	AI & Machine Learning
6	20CSEL607	Agile Methodologies	3	0	0	3	3	Computing & Infor. Systems
7	20CSEL604	Bio Informatics	3	0	0	3	3	Data Analytics & Security
8	20CSEL601	Software Project Management	3	0	0	3	3	Computing & Infor. Systems
9	20ITEL711	Storage Area Network	3	0	0	3	3	Cloud Computing
10	20ITEL712	Digital Forensics And Cyber Laws	3	0	0	3	3	Data Analytics & Security
11	20MGEL701	Foundation Skills in Integrated Product Development	3	0	0	3	3	Management

PROFESSIONAL ELECTIVES - IV

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20ITEL801	Free and Open Source Software Tools	3	0	0	3	3	Cloud Computing
2	20ITEL802	Virtual and Augmented Reality	3	0	0	3	3	Internet of Things
3	20ITEL803	Intrusion Detection Systems	3	0	0	3	3	Data Analytics & Security
4	20CSEL702	Software Defined Networks	3	0	0	3	3	Cloud Computing
5	20ITEL804	Digital Image Processing	3	0	0	3	3	Computing & Infor. Systems
6	20ITEL805	Information System Audit	3	0	0	3	3	Computing & Infor. Systems
7	20ITEL806	Pattern Recognition Techniques	3	0	0	3	3	AI & Machine Learning
8	20CSEL809	Game Programming	3	0	0	3	3	AI & Machine Learning
9	20ITEL807	IoT Based Smart Systems	3	0	0	3	3	Internet of Things
10	20ITEL808	Web Security	3	0	0	3	3	Data Analytics & Security
11	20MGEL801	Professional Ethics and Values	3	0	0	3	3	Management

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

Graduates of the B.Tech Information Technology Program will

- PEO 1** Formulate, analyze and solve engineering problems with sound foundations in mathematical, scientific / basic engineering fundamentals in the field of Information and Communication and pursue higher studies.
- PEO 2** Design, Develop and Deploy engineering solutions using state-of-the art Information Technologies in a diverse culture that addresses the needs of the society and industry.
- PEO 3** Promote implementation of products and services in the recent technologies through good communication skills and leadership qualities.
- PEO 4** Comprehend the impact of engineering projects on society and demonstrate ethical, professional implications / responsibilities in their work, guided by sustainable development through global interconnectedness.
- PEO 5** Accomplish excellence by adhering to the changing direction in Information Technology through life-long learning and in research by being aware of recent research artifacts.

PROGRAM SPECIFIC OUTCOMES (PSOs)

The Graduates of B.Tech Information Technology will be able to

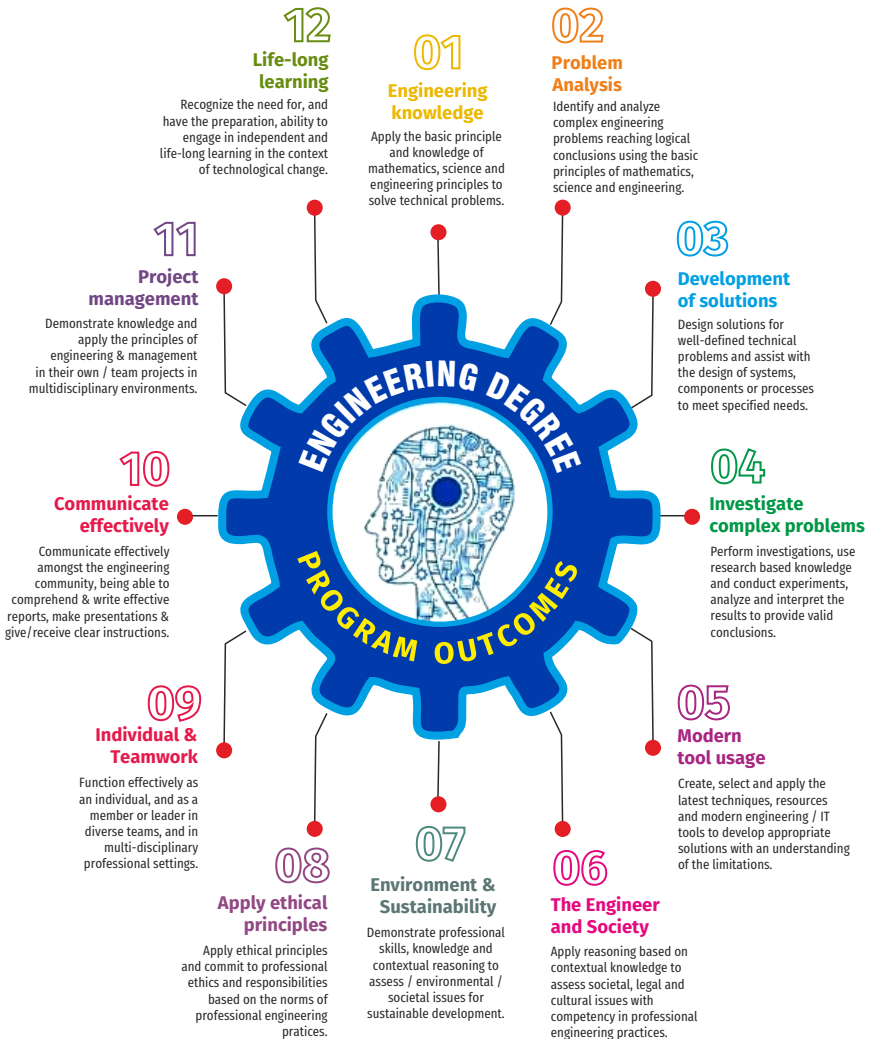
- PSO 1** Use and apply current technical concepts and practices in the core Information Technologies of human computer interaction, information management, programming, networking.
- PSO 2** Effectively integrate IT-based solutions into the user environment

COMPONENTS OF THE CURRICULUM (COC)

Course Component	Curriculum Content (% of total number of credits of the program)	Total number of contact hours	Total Number of credits
Basic Sciences(BS)	17.5	31	29.5
Engineering Sciences(ES)	15.1	33	25.5
Humanities and Social Sciences (HS)	6.0	12	10
Professional Electives(EL)	7.1	10	12
Program Core+Program Lab (PC+PL)	31.4	70	53
Program theory with Lab (PW)	7.1	15	12
Open Electives (OE)	3.6	06	6
Talent Enhancement (TE)	2.4	08	4
Project (PJ)	4.1	14	7
Training & Placement (TP)	4.1	14	7
Internships/Seminars (IS)	1.8	-	3
Mandatory Courses (MC)	NA	06	NA
Total number of Credits		219	170

PROGRAMME OUTCOMES(POs)

PROGRAM OUTCOME REPRESENTS THE KNOWLEDGE, SKILLS AND ATTITUDES THAT THE STUDENTS WOULD BE EXPECTED TO HAVE AT THE END OF THE 4 YEAR ENGINEERING DEGREE PROGRAM





Sri

SAI RAM

INSTITUTE OF TECHNOLOGY

An Autonomous Institution

West Tambaram, Chennai - 44

www.sairamit.edu.in

*Approved by AICTE, New Delhi
Affiliated to Anna University*



DEPARTMENT OF MANAGEMENT STUDIES

**REGULATIONS
2020**

Academic Year 2020-21 onwards

AUTONOMOUS

**PG CURRICULUM AND
SYLLABUS
I - IV
SEMESTERS**

AUTONOMOUS CURRICULA AND SYLLABI

Regulations 2020

SEMESTER I

S. NO	COURSE CODE	COURSE TITLE		WEEK HOURS			CREDITS
				L	T	P	
THEORY							
1	20MBT101	Accounting for Decision Making	BC	4	0	0	4
2	20MBT102	Economic Analysis for Managers	BC	4	0	0	4
3	20MBT103	Organizational Behaviour	BC	3	0	0	3
4	20MBT104	Business Statistics & Analytics For Decision Making	BC	3	0	0	3
5	20MBT105	Legal & Business Environment	BC	3	0	0	3
6	20MBT106	Principles Of Management	BC	3	0	0	3
7	20MBT107	Entrepreneurship Management	BC	3	0	0	3
PRACTICAL							
8	20MBP108	Case Lab – I	SDC	0	0	2	2
9	20MBP109	Life & Managerial Skills	SDC	0	0	2	2
10	20MBP110	Immersion Project	SDC	0	0	2	2
TOTAL							29

SEMESTER II

S. NO	COURSE CODE	COURSE TITLE		WEEK HOURS			CREDITS
				L	T	P	
THEORY							
1	20MBT201	Financial Management Decision and Application	PC	3	0	0	3
2	20MBT202	Human Resource Management	PC	3	0	0	3
3	20MBT203	Marketing Management	PC	4	0	0	4
4	20MBT204	Managing Operations	PC	3	0	0	3
5	20MBT205	Business Optimization Techniques	PC	3	0	0	3
6	20MBT206	Business Research Methods	PC	3	0	0	3
7	20MBT207	Information Systems & Business Analytics	PC	3	0	0	3
PRACTICAL							
8	20MBP208	Data Analysis Lab	BC	0	0	4	3
9	20MBP209	Professional Skill Development	SDC	0	0	2	2
10	20MBP210	Case Lab – II	SDC	0	0	2	2
GENERAL INTEREST COURSE							
11	20MBG211 20MBG212	Specific Interest Course (Mandatory) ● Certification Courses (MOOC) ● Indian or Foreign Language courses	SDC	Completed/ Not Completed			
TOTAL							29

SEMESTER III

S. NO	COURSE CODE	COURSE TITLE		WEEK HOURS			CREDITS
				L	T	P	
THEORY							
1	20MBT301	International Business Management	PC	3	0	0	3
2	20MBT302	Strategic Management	PC	3	0	0	3
3	E1	Elective 1	PE	3	0	0	3
4	E2	Elective 2	PE	3	0	0	3
5	E3	Elective 3	PE	3	0	0	3
6	E4	Elective 4	PE	3	0	0	3
7	E5	Elective 5	PE	3	0	0	3
8	E6	Elective 6	PE	3	0	0	3
PRACTICAL							
9	20MBP301	Case Lab – III	SDC	0	0	2	2
10	20MBP302	Career Enrichment Techniques	VAC	0	0	2	2
11	20MBP303	Summer Internship (4 weeks)	SI	0	0	2	2
12	20MBP304	Developing Consulting/ Developing Business Model	SDC	Completed / Not Completed			
TOTAL							30

SEMESTER IV

S. NO	COURSE CODE	COURSE TITLE		WEE	HOU	S	CREDITS
				L	T	P	
THEORY							
1	20MBP401	Major Project	FP	0	0	24	12
CAREER ENRICHMENT COURSE							
2	20MBG401	Elective based certification course	SDC	Completed / Not Completed			
3	20MBG402	Career Enrichment Program	SDC	Satisfactory / Unsatisfactory			
TOTAL							12

ELECTIVES OFFERED

1. FINANCE STREAM

	Code No.	Course Title	L	T	P	C
1	20MBF301	Investment Analysis and Portfolio Management	3	0	0	3
2	20MBF302	Merchant Banking and Financial Services	3	0	0	3
3	20MBF303	Indian Banking and Financial System	3	0	0	3
4	20MBF304	Finance Analytics	3	0	0	3
5	20MBF305	Enterprise Risk Management and Insurance	3	0	0	3
6	20MBF306	Global Finance and Forex Management	3	0	0	3
7	20MBF307	Financial Derivatives	3	0	0	3

2. MARKETING STREAM

	Code No.	Course Title	L	T	P	C
1	20MBM301	Services Marketing	3	0	0	3
2	20MBM302	Social and Digital Marketing	3	0	0	3
3	20MBM303	Integrated Marketing Communications	3	0	0	3
4	20MBM304	Retail Management	3	0	0	3
5	20MBM305	Marketing Analytics	3	0	0	3
6	20MBM306	New Product Strategies & Brand Management	3	0	0	3
7	20MBM307	Managing Distribution Channel	3	0	0	3

3. HUMAN RESOURCE STREAM

	Code No.	Course Title	L	T	P	C
1	20MBHR301	Strategic Human Resource Management	3	0	0	3
2	20MBHR302	Conflict Management	3	0	0	3
3	20MBHR303	Cross Cultural Management	3	0	0	3
4	20MBHR304	Social Psychology	3	0	0	3
5	20MBHR305	Talent Acquisition and Retention	3	0	0	3
6	20MBHR306	Industrial Relations and Labour Legislation	3	0	0	3
7	20MBHR307	People Analytics	3	0	0	3

4. OPERATIONS, LOGISTICS STREAM

	Code No.	Course Title	L	T	P	C
1	20MBO301	Supply Chain and Logistics Management	3	0	0	3
2	20MBO302	Project Management	3	0	0	3
3	20MBO303	Strategic Operations and Innovation	3	0	0	3
4	20MBO304	Total Quality Management	3	0	0	3
5	20MBO305	Product Design	3	0	0	3
6	20MBO306	Intellectual Property Rights (IPR)	3	0	0	3
7	20MBO307	Operations Analytics	3	0	0	3

5. IT & ANALYTICS STREAM

	Code No.	Course Title	L	T	P	C
1	20MBS301	Enterprise Resource Planning	3	0	0	3
2	20MBS302	e-Commerce	3	0	0	3
3	20MBS303	Artificial Intelligence and Machine Learning for Decision Making	3	0	0	3
4	20MBS304	Data Mining	3	0	0	3
5	20MBS305	Business Analytics and Big Data	3	0	0	3
6	20MBS306	DBMS & SQL	3	0	0	3



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DEPARTMENT OF
**COMPUTER SCIENCE &
ENGINEERING**

**REGULATIONS
2020**

Academic Year 2020-21 onwards

**AUTONOMOUS
CURRICULUM AND**

**SYLLABUS
I - VIII
SEMESTERS**

SRI SAIRAM INSTITUTE OF TECHNOLOGY



VISION

To be identified as a “Centre of Excellence” with high standards of Knowledge Dissemination and Research opportunities and to transform the students to imbibe qualities of technical expertise of international standards and high levels of ethical values, who in turn shall contribute to the advancement of society and human kind.



MISSION

We shall dedicate and commit ourselves to attain and maintain excellence in Technical Education through commitment and continuous improvement of infrastructure and equipment and provide an inspiring environment for Learning, Research and Innovation for our students to transform them into complete human beings with ethical and social values.



QUALITY POLICY

We at Sri Sai Ram Institute of Technology are committed to build a better nation through Quality Education with team spirit. Our students are enabled to excel in all values of Life and become Good Citizens. We continually improve the System, Infrastructure and Services to satisfy the Students, Parents, Industry and Society.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING



VISION

To be a centre of excellence in educating and graduating Computer Engineers by providing unique environment that foster research, technological, and social enrichment with intellectual knowledge to acquire international standards.



MISSION

- To deliver qualified computer professionals having innovative research capabilities.
- To inculcate the spirit of moral values that contributes to societal ethics.
- To provide training programs that bridges the gap between academia and industry.
- To enhance research quality and productivity through state of the art facilities.

AUTONOMOUS CURRICULA AND SYLLABI Regulations 2020

SEMESTER I

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA101	Engineering Mathematics-I	3	1	0	4	4
2	20HSEN101	Technical English-I	3	0	0	3	3
3	20BSPH101	Engineering Physics	3	0	0	3	3
4	20BSCY101	Engineering Chemistry	3	0	0	3	3
5	20ESCS101	Problem Solving and Programming in C	3	0	0	3	3
6	20ESGE101	Engineering Graphics	1	2	0	3	3
PRACTICALS							
7	20BSPL101	Physics and Chemistry Laboratory	0	0	3	3	1.5
8	20ESPL101	Programming in C Laboratory	0	0	3	3	1.5
VALUE ADDITIONS - I							
9	20TPHS101	Skill Enhancement	0	0	2	2	1
10	20HSMG101	Personal Values	2	0	0	2	0
TOTAL						29	23

SEMESTER II

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA204	Discrete Structures	3	1	0	4	4
2	20HSEN201	Technical English – II	3	0	0	3	3
3	20BSPH203	Physics for Information Science	3	0	0	3	3
4	20BSCY201	Environmental Science and Engineering	3	0	0	3	3
5	20ESIT202	Python Programming	3	0	0	3	3
6	20ESIT203	Digital Principles and System Design	2	1	0	3	3
PRACTICALS							
7	20ESPL201	Python Programming Laboratory	0	0	3	3	1.5
8	20ESPL202	Digital Laboratory	0	0	3	3	1.5
9	20ESGE201	Engineering Practices Laboratory	0	0	3	3	1.5
VALUE ADDITIONS - II							
10	20TPHS201	Skill Enhancement	0	0	2	2	1
11	20HSMG201	Interpersonal Values	2	0	0	2	0
TOTAL						33	24.5

SEMESTER III

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA304	Statistics and Linear Algebra	3	1	0	4	4
2	20CSPC301	Object Oriented Programming	2	1	0	3	3
3	20ESEC301	Communication Engineering	3	0	0	3	3
4	20ITPC301	Data Structures	3	0	0	3	3
5	20ITPC303	Computer Organization and Architecture	3	0	0	3	3
PRACTICALS							
6	20ITPL301	Data Structures Laboratory	0	0	3	3	1.5
7	20CSPL301	Object Oriented Programming Laboratory	0	0	3	3	1.5
8	20CSTE301	Live-in-Lab - I	0	0	2	2	1
VALUE ADDITIONS - III							
9	20CSTP301	Skill Enhancement	0	0	2	2	1
10	20MGMC301	Constitution of India	2	0	0	2	0
TOTAL						28	21

SEMESTER IV

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA402	Probability and Queuing Theory	3	1	0	4	4
2	20CSPW401	Computer Networks (With Laboratory)	3	0	2	5	4
3	20CSPC401	Operating Systems	3	0	0	3	3
4	20CSPC402	Database Management Systems	3	0	0	3	3
5	20CSPC403	Object Oriented Software Engineering	3	0	0	3	3
6	20ITPC401	Design and Analysis of Algorithms	2	1	0	3	3
PRACTICALS							
7	20CSPL401	Operating Systems Laboratory	0	0	3	3	1.5
8	20CSPL402	Database Management Systems Laboratory	0	0	3	3	1.5
9	20CSTE401	Live-in-Lab - II	0	0	2	2	1
VALUE ADDITIONS - IV							
10	20CSTP401	Skill Enhancement	0	0	2	2	1
TOTAL						31	25

SEMESTER V

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20CSPC501	Internet Programming	3	0	0	3	3
2	20CSPC502	Theory of Computation	2	1	0	3	3
3	20ESEC502	Microprocessors and Microcontrollers	3	0	0	3	3
4	20CSPC503	Mobile Computing	3	0	0	3	3
5	20XXELXXX	Professional Elective – I	3	0	0	3	3
6	20XXOEXXX	Open Elective - I	3	0	0	3	3
PRACTICALS							
7	20CSPL501	Internet Programming Laboratory	0	0	4	4	2
8	20ESPL501	Microprocessors & Microcontrollers Laboratory	0	0	3	3	1.5
9	20CSTE501	Live in Lab - III	0	0	4	4	2
VALUE ADDITIONS - V							
10	20CSTP501	Skill Enhancement	0	0	2	2	1
TOTAL						31	24.5

SEMESTER VI

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20CSPC601	Artificial Intelligence	3	0	0	3	3
2	20CSPC602	Compiler Design	3	0	0	3	3
3	20CSPC603	Cloud Computing	3	0	0	3	3
4	20XXELXXX	Professional Elective – II	3	0	0	3	3
5	20HSMG601	Principles of Engineering Management	3	0	0	3	3
PRACTICALS							
6	20CSPL601	Artificial Intelligence Laboratory	0	0	3	3	1.5
7	20CSPL602	Cloud Computing Laboratory	0	0	3	3	1.5
8	20HSPL501	Communication and Soft Skills Laboratory	0	0	2	2	1
9	20CSPJ601	Innovative Design Project	0	0	2	2	1
VALUE ADDITIONS - VI							
10	20CSTP601	Skill Enhancement	0	0	2	2	1
TOTAL						27	21

SEMESTER VII

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20CSPC701	Big Data Analytics	3	0	0	3	3
2	20CSPC702	Machine Learning Techniques	3	0	0	3	3
3	20ITPC701	Cryptography and Network Security	3	0	0	3	3
4	20XXELXXX	Professional Elective -III	3	0	0	3	3
5	20XXOEXXX	Open Elective – II	3	0	0	3	3
PRACTICALS							
6	20CSPL701	Big Data Analytics Laboratory	0	0	3	3	1.5
7	20ITPL701	Cryptography & Network Security Laboratory	0	0	3	3	1.5
8	20CSPJ701	Project Phase - I	0	0	4	4	2
VALUE ADDITIONS - VII							
10	20CSTP701	Skill Enhancement	0	0	2	2	1
TOTAL						27	21

SEMESTER VIII

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20XXELXXX	Professional Elective - IV	3	0	0	3	3
PRACTICAL							
2	20CSPJ801	Project Phase - II	0	0	8	8	4
TOTAL						11	7

CREDIT DISTRIBUTION

Category	BS	ES	HS	EL	PC+PL	PW	OE	TE	PJ	TP	IS	MC	TOTAL
Credit	29.5	25.5	10	12	62	04	06	04	7	7	3	Y	170
Percentage	17.4	15.0	5.9	7.1	36.5	2.4	3.5	2.4	4.1	4.1	1.8	-	

*IS-Internship

PROFESSIONAL ELECTIVES - I

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1.	20CSEL501	Data Warehousing and Data Mining	3	0	0	3	3	Artificial Intelligence
2.	20CSEL502	Cyber Forensics	3	0	0	3	3	Cloud Computing & Security
3.	20CSEL503	Distributed Systems	3	0	0	3	3	Cloud Computing & Security
4.	20CSEL504	Foundation of Data Science	3	0	0	3	3	Data Science
5.	20CSEL505	NoSQL Database	3	0	0	3	3	Data Science
6.	20ITEL601	Software Testing	3	0	0	3	3	Software Engg. & Computing
7.	20ITEL706	Computer Graphics and Multimedia	3	0	0	3	3	Software Engg. & Computing
8.	20ITEL702	Wireless Ad Hoc and Sensor Networks	3	0	0	3	3	Internet of Things
9.	20ITEL804	Digital Image Processing	3	0	0	3	3	Artificial Intelligence
10.	20ITEL709	Internet of Things	3	0	0	3	3	Internet of Things
11.	20MGEL501	Intellectual Property Rights	3	0	0	3	3	Management

PROFESSIONAL ELECTIVES - II

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20CSEL601	Software Project Management	3	0	0	3	3	Software Engg. & Computing
2	20CSEL602	Digital Forensics	3	0	0	3	3	Cloud Computing & Security
3	20CSEL603	Virtualization Technologies	3	0	0	3	3	Cloud Computing & Security
4	20CSEL604	Bio Informatics	3	0	0	3	3	Data Science
5	20CSEL605	Predictive Modeling	3	0	0	3	3	Data Science
6	20CSEL606	IoT Architecture, Network & Security	3	0	0	3	3	Internet of Things
7	20CSEL607	Agile Methodologies	3	0	0	3	3	Software Engg. & Computing
8	20ITEL607	Embedded Systems	3	0	0	3	3	Internet of Things
9	20CSEL608	Soft Computing	3	0	0	3	3	Artificial Intelligence
10	20ITEL806	Pattern Recognition Techniques	3	0	0	3	3	Artificial Intelligence
11.	20MGEL601	Total Quality Management	3	0	0	3	3	Management

PROFESSIONAL ELECTIVES - III

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1.	20CSEL701	Social Network Analysis	3	0	0	3	3	Data Science
2.	20CSEL702	Software Defined Networks	3	0	0	3	3	Cloud Computing & Security
3.	20CSEL703	Information Retrieval Techniques	3	0	0	3	3	Artificial Intelligence
4.	20CSEL704	Natural Language Processing	3	0	0	3	3	Artificial Intelligence
5.	20CSEL705	Ethical Hacking	3	0	0	3	3	Cloud Computing & Security
6.	20CSEL706	Multi-core Architectures and Programming	3	0	0	3	3	Internet of Things
7.	20CSEL707	Web Analytics	3	0	0	3	3	Data Science
8.	20CSEL708	IT Security Compliance and Forensics	3	0	0	3	3	Software Engg. & Computing
9.	20MEPC702	Robotics and Applications	3	0	0	3	3	Internet of Things
10.	20ITEL803	Intrusion Detection Systems	3	0	0	3	3	Software Engg. & Computing
11.	20MGEL701	Foundation Skills in Integrated Product Development	3	0	0	3	3	Management

PROFESSIONAL ELECTIVES - IV

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20CSEL801	Green Computing	3	0	0	3	3	Cloud Computing & Security
2	20CSEL802	Deep Learning Principles & Practices	3	0	0	3	3	Data Science
3	20CSEL803	Block Chain and Crypto Currency Technologies	3	0	0	3	3	Cloud Computing & Security
4	20CSEL804	Software Quality Assurance	3	0	0	3	3	Software Engg. & Computing
5	20CSEL805	Speech Processing	3	0	0	3	3	Artificial Intelligence
6	20CSEL806	Cognitive Science	3	0	0	3	3	Software Engg. & Computing
7	20CSEL807	Computer Vision	3	0	0	3	3	Artificial Intelligence
8	20CSEL808	Scientific Visualization Techniques	3	0	0	3	3	Data Science
9	20CSEL809	Game Programming	3	0	0	3	3	Internet of Things
10	20ITEL802	Virtual & Augmented Reality	3	0	0	3	3	Internet of Things
11.	20HSMG301	Professional Ethics and Values	3	0	0	3	3	Management

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- PEO1** To enable graduates to have sound knowledge in the core competency areas of Mathematics, Scientific and Engineering concepts to analyse and solve problems in the field of Computer Science and Engineering.
- PEO2** To empower graduates to excel in collaborative learning and the spirit of teamwork through multidisciplinary projects with current tools and technologies to meet Industrial and Societal needs.
- PEO3** To facilitate graduates to have the ability and attitude to acquire new skills and adapt to emerging technological changes.
- PEO4** To ensure graduates can pursue Higher Education, Research, as Entrepreneurs or have a successful career in Industry.

PROGRAM SPECIFIC OUTCOMES (PSOs)

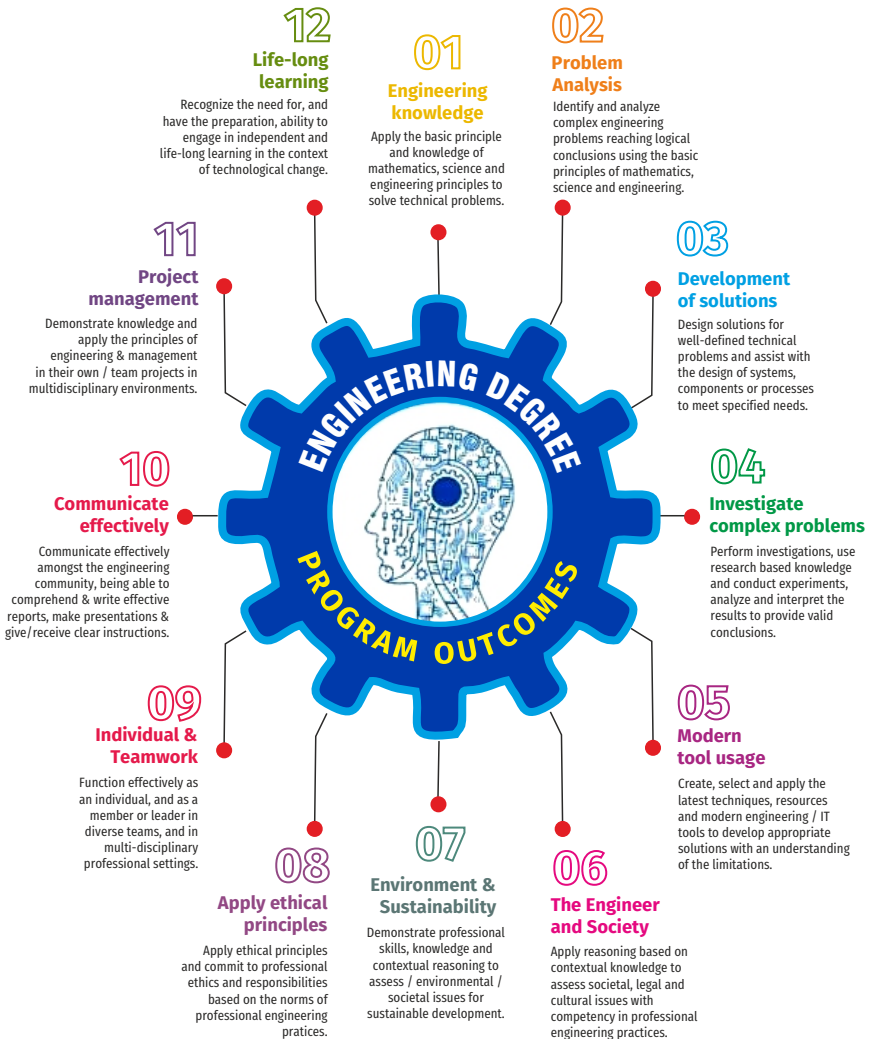
- PSO1** The Computer Science and Engineering graduates are able to analyze, design, develop, test and apply management principles, mathematical foundations in the development of computational solutions, make them to expert in designing the computer software and hardware.
- PSO2** Develop their skills to solve problems in the broad area of programming concepts and appraise environmental and social issues with ethics and manage different projects in inter-disciplinary field.

COMPONENTS OF THE CURRICULUM (COC)

Course Component	Curriculum Content (% of total number of credits of the program)	Total number of contact hours	Total Number of credits
Basic Sciences(BS)	17.4	31	29.5
Engineering Sciences(ES)	15.0	33	25.5
Humanities and Social Sciences (HS)	5.9	12	10
Professional Electives(EL)	7.1	12	12
Program Core+Program Lab (PC+PL)	36.5	76	62
Program theory with Lab (PW)	2.4	05	04
Open Electives (OE)	3.5	06	06
Talent Enhancement (TE)	2.4	08	04
Project (PJ)	4.1	14	07
Training & Placement (TP)	4.1	14	07
Internships/Seminars (IS)	1.8	-	03
Mandatory Courses (MC)	NA	06	NA
Total number of Credits		217	170

PROGRAMME OUTCOMES(POs)

PROGRAM OUTCOME REPRESENTS THE KNOWLEDGE, SKILLS AND ATTITUDES THAT THE STUDENTS WOULD BE EXPECTED TO HAVE AT THE END OF THE 4 YEAR ENGINEERING DEGREE PROGRAM





Sri

SAI RAM

INSTITUTE OF TECHNOLOGY

An Autonomous Institution

West Tambaram, Chennai - 44

www.sairamit.edu.in

Approved by AICTE, New Delhi
Affiliated to Anna University



DEPARTMENT OF
**ELECTRONICS AND
COMMUNICATION ENGINEERING**

**REGULATIONS
2020**

Academic Year 2020-21 onwards

**AUTONOMOUS
CURRICULUM AND**

**SYLLABUS
I - VIII
SEMESTERS**

SRI SAIRAM INSTITUTE OF TECHNOLOGY



VISION

To be identified as a “Centre of Excellence” with high standards of Knowledge Dissemination and Research opportunities and to transform the students to imbibe qualities of technical expertise of international standards and high levels of ethical values, who in turn shall contribute to the advancement of society and human kind.



MISSION

We shall dedicate and commit ourselves to attain and maintain excellence in Technical Education through commitment and continuous improvement of infrastructure and equipment and provide an inspiring environment for Learning, Research and Innovation for our students to transform them into complete human beings with ethical and social values.



QUALITY POLICY

We at Sri Sai Ram Institute of Technology are committed to build a better nation through Quality Education with team spirit. Our students are enabled to excel in all values of Life and become Good Citizens. We continually improve the System, Infrastructure and Services to satisfy the Students, Parents, Industry and Society.

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGG.



VISION

To become a leading department of excellence in academic and research imparting high quality technical education in Electronics and Communication Engineering through international standards and making our students technologically superior and ethically strong to serve the society and mankind.



MISSION

To create an inspiring environment that shall enhance the growth of innovative research professional excellences who can contribute to the society and mankind, ethical and societal values through life-long learning.

AUTONOMOUS CURRICULA AND SYLLABI Regulations 2020

SEMESTER I

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA101	Engineering Mathematics-I	3	1	0	4	4
2	20HSEN101	Technical English-I	3	0	0	3	3
3	20BSPH101	Engineering Physics	3	0	0	3	3
4	20BSCY101	Engineering Chemistry	3	0	0	3	3
5	20ESCS101	Problem Solving and Programming in C	3	0	0	3	3
6	20ESGE101	Engineering Graphics	1	2	0	3	3
PRACTICAL							
7	20BSPL101	Physics and Chemistry Laboratory	0	0	3	3	1.5
8	20ESPL101	Programming in C Laboratory	0	0	3	3	1.5
VALUE ADDITIONS - I							
9	20TPHS101	Skill Enhancement	0	0	2	2	1
10	20HSMG101	Personal Values	2	0	0	2	0
TOTAL						29	23

SEMESTER II

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA201	Engineering Mathematics -II	3	1	0	4	4
2	20HSEN201	Technical English - II	3	0	0	3	3
3	20ESIT201	Python Programming with lab	3	0	2	5	4
4	20BSPH201	Physics of Electronic Devices	3	0	0	3	3
5	20ECPC201	Circuit Analysis	3	0	0	3	3
PRACTICAL							
6	20ESGE201	Engineering Practices Laboratory	0	0	3	3	1.5
7	20ECPL201	Circuits and Devices Laboratory	0	0	3	3	1.5
8	20ECTE201	PCB Design	0	0	2	2	1
VALUE ADDITIONS - II							
9	20TPHS201	Skill Enhancement	0	0	2	2	1
10	20HSMG201	Interpersonal Values	2	0	0	2	0
TOTAL						30	22

SEMESTER III

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20ECPC301	Digital Electronics	3	0	0	3	3
2	20ECPC302	Electromagnetic Fields & Waveguides	3	1	0	4	4
3	20ECPC303	Signals and Systems	3	1	0	4	4
4	20ECPW301	R Programming with Laboratory	3	0	2	5	4
5	20BSMA301	Linear Algebra, Partial Differential Equations and Transforms	3	1	0	4	4
PRACTICAL							
6	20ECP301	Digital Circuits Laboratory	0	0	3	3	1.5
7	20ECTE301	Live-in-Lab - I	0	0	2	2	1
VALUE ADDITIONS - III							
8	20ECTP301	Skill Enhancement	0	0	2	2	1
9	20MGMC301	Constitution of India	2	0	0	2	0
TOTAL						28	22.5

SEMESTER IV

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20ECPC401	Communication Theory	3	0	0	3	3
2	20ECPW401	Electronic Circuits with Laboratory	3	0	2	5	4
3	20ECPW402	Linear integrated Circuits with Laboratory	3	0	2	5	4
4	20ECPC402	Microcontrollers & Embedded Systems	3	0	0	3	3
5	20BSMA401	Probability theory and Stochastic processes	3	1	0	4	4
6	20BSCY201	Environmental Science and Engineering	3	0	0	3	3
PRACTICAL							
7	20ECP401	Microcontrollers & Embedded Systems Laboratory	0	0	3	3	1.5
VALUE ADDITIONS - IV							
8	20ECTE401	Live-in-Lab -II	0	0	2	2	1
9	20ECTP401	Skill Enhancement	0	0	2	2	1
TOTAL						30	24.5

SEMESTER V

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20ECPC501	Digital Communication	3	0	0	3	3
2	20ECPW501	Discrete Time Signal Processing with Laboratory	3	0	2	5	4
3	20ECPC502	VLSI Design	3	0	0	3	3
4	20ECELXXX	Professional Elective-I	3	0	0	3	3
5	20XXOEXXX	Open Elective-I	3	0	0	3	3
PRACTICAL							
6	20ECPL501	Communication Systems Laboratory	0	0	3	3	1.5
7	20ECPL502	VLSI Laboratory	0	0	3	3	1.5
8	20ECTE501	Live-in-Lab III	0	0	4	4	2
VALUE ADDITIONS - V							
9	20ECTP501	Skill Enhancement	0	0	2	2	1
TOTAL						29	22

SEMESTER VI

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20ECPC601	Transmission Lines & Antennas	3	0	0	3	3
2	20ECPC602	Communication Networks	3	0	0	3	3
3	20ECPC603	Wireless Communication	3	0	0	3	3
4	20ECELXXX	Professional Elective-II	3	0	0	3	3
5	20XXOEXXX	Open Elective - II	3	0	0	3	3
PRACTICAL							
6	20HSP501	Communication and Soft Skills Laboratory	0	0	2	2	1
7	20ECPL601	Antennas Laboratory	0	0	3	3	1.5
8	20ECPL602	Networks Laboratory	0	0	3	3	1.5
9	20ECPJ601	Innovative Design Project	0	0	2	2	1
VALUE ADDITIONS - VI							
10	20ECTP601	Skill Enhancement	0	0	2	2	1
TOTAL						27	21

SEMESTER VII

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20ECPC701	RF and Microwave Engineering	3	0	0	3	3
2	20ECPC702	Optical Communication	3	0	0	3	3
3	20CSPC601	Artificial Intelligence	3	0	0	3	3
4	20ECELXXX	Professional Elective-III	3	0	0	3	3
5	20HSMG601	Principles of Engineering Management	3	0	0	3	3
PRACTICAL							
6	20ECPJ701	Advanced Communication Laboratory	0	0	3	3	1.5
7	20CSPJ601	Artificial Intelligence Laboratory	0	0	3	3	1.5
8	20ECPJ701	Project Phase - I	0	0	4	4	2
VALUE ADDITIONS - VII							
9	20ECTP701	Skill Enhancement	0	0	2	2	1
TOTAL						27	21

SEMESTER VIII

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20ECELXXX	Professional Elective - IV	3	0	0	3	3
PRACTICAL							
2	20ECPJ801	Project Phase - II	0	0	8	8	4
TOTAL						11	7

CREDIT DISTRIBUTION

Category	BS	ES	HS	EL	PC+PL	PW	OE	TE	PJ	TP	IS	MC	TOTAL
Credit	29.5	13	10	12	57.5	16	6	5	7	7	3	Y	166
Percentage	17.8	7.8	6.0	7.2	34.6	9.6	3.6	3.0	4.2	4.2	1.8	-	

*IS-Internship

PROFESSIONAL ELECTIVES - I

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20ECE501	Advanced Communication Systems and Techniques	3	0	0	3	3	Wireless
2	20ECE502	Industrial IOT	3	0	0	3	3	Wireless
3	20ECE503	FPGA & ASIC Design	3	0	0	3	3	VLSI
4	20ECE504	Programmable Logic Controllers	3	0	0	3	3	VLSI
5	20ECE505	Sensors and RFID	3	0	0	3	3	RF & Green
6	20ECE506	Sustainable Energy and Energy Management	3	0	0	3	3	RF & Green
7	20ECE507	Sensors and measurements	3	0	0	3	3	Signal Processing
8.	20ECE508	Control Systems Engineering	3	0	0	3	3	Signal Processing
9.	20ECE509	Soft Computing	3	0	0	3	3	Biomedical
10.	20ECE510	Biosignal and Image Processing	3	0	0	3	3	Biomedical
11.	20MGEL501	Intellectual Property Rights	3	0	0	3	3	Management

PROFESSIONAL ELECTIVES - II

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM	
			L	T	P				
1	20ECE601	Radio Access Networks	3	0	0	3	3	Wireless	
2	20ECE602	Wireless Sensor Networks	3	0	0	3	3	Wireless	
3	20ECE603	CMOS Analog IC Design	3	0	0	3	3	VLSI	
4	20ECE604	Software for Embedded Systems	3	0	0	3	3	VLSI	
5	20ECE605	Electromagnetic Interference and Compatibility	3	0	0	3	3	RF & Green	
6	20ECE606	Green Radio Communication Networks		3	0	0	3	3	RF & Green
7	20ECE607	Biomedical Instrumentation	3	0	0	3	3	Signal Processing	
8.	20ECE608	Pattern Recognition	3	0	0	3	3	Signal Processing	
9.	20ECE609	Machine Learning Techniques	3	0	0	3	3	Biomedical	
10.	20ECE610	Medical Electronics	3	0	0	3	3	Biomedical	
11.	20MGEL601	Total Quality Management	3	0	0	3	3	Management	

PROFESSIONAL ELECTIVES - III

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20ECEL701	Cognitive Radio	3	0	0	3	3	Wireless
2	20ECEL702	Smart Antennas for Mobile Communication and GPS	3	0	0	3	3	Wireless
3	20ECEL703	Mixed Signal IC Design	3	0	0	3	3	VLSI
4	20ECEL704	Embedded Processor for Signal Processing	3	0	0	3	3	VLSI
5	20ECEL705	Antennas for Modern Communication	3	0	0	3	3	RF & Green
6	20ECEL706	Microwave and Millimeter Wave Circuits and Systems	3	0	0	3	3	RF & Green
7	20ECEL707	DSP Processor Architecture and Programming	3	0	0	3	3	Signal Processing
8.	20ECEL708	Brain Computer interface and its applications	3	0	0	3	3	Signal Processing
9.	20ECEL709	Digital Image Processing	3	0	0	3	3	Biomedical
10.	20ECEL710	Deep Learning Principles & Practices	3	0	0	3	3	Biomedical
11.	20MGEL701	Foundation Skills in Integrated Product Development	3	0	0	3	3	Management

PROFESSIONAL ELECTIVES - IV

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20ECEL801	5G and 6G Wireless Communication Systems	3	0	0	3	3	Wireless
2	20ECEL802	Underwater Wireless Communication Systems	3	0	0	3	3	Wireless
3	20ECEL803	Electronic Packaging and Testing	3	0	0	3	3	VLSI
4	20ECEL804	Embedded Product Development	3	0	0	3	3	VLSI
5	20ECEL805	RF System Design and MMIC	3	0	0	3	3	RF & Green
6	20ECEL806	Photonic Networks	3	0	0	3	3	RF & Green
7	20ECEL807	Telehealth Technology	3	0	0	3	3	Signal Processing
8.	20ECEL808	Medical Informatics	3	0	0	3	3	Signal Processing
9.	20ECEL809	Robotics and Automation	3	0	0	3	3	Biomedical
10.	20ECEL810	Medical Imaging Systems	3	0	0	3	3	Biomedical
11.	20MGEL801	Professional Ethics and Values	3	0	0	3	3	Management

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- PEO1** Acquire strong foundation in Engineering, Science and Technology for a successful career in Electronics and Communication Engineering.
- PEO2** Apply their knowledge and skills acquired to solve the issues in real world Electronics and Communication sectors and to develop feasible and viable systems.
- PEO3** Be receptive to new technologies and attain professional competence through professional society activities.
- PEO4** Participate in lifelong learning, higher education efforts to emerge as expert researchers and technologists.
- PEO5** Practice the profession with ethics, integrity, leadership and social responsibilities.

PROGRAM SPECIFIC OUTCOMES (PSOs)

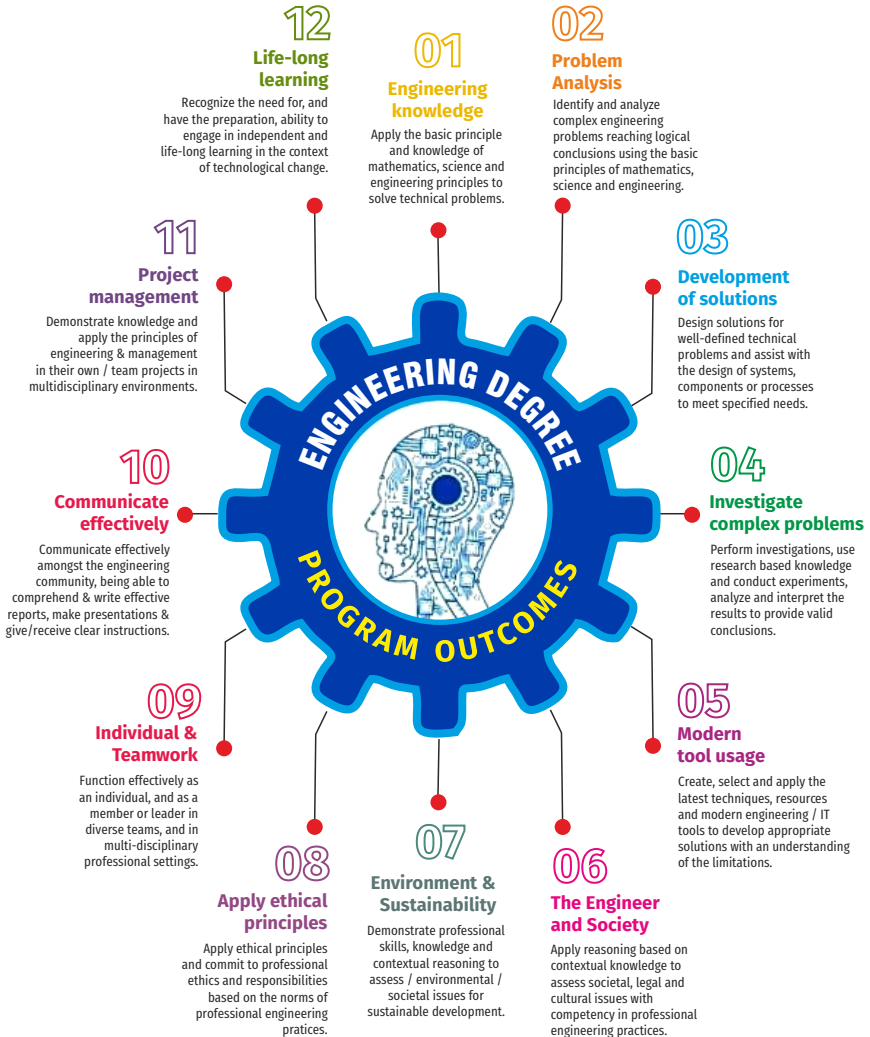
- PSO1** Design, implement and test Electronics and Communication systems using analytical knowledge and applying modern hardware and software tools
- PSO2** Develop their skills to solve problems and assess social, environmental issues with ethics and manage different projects in multidisciplinary areas.

COMPONENTS OF THE CURRICULUM (COC)

Course Component	Curriculum Content (% of total number of credits of the program)	Total number of contact hours	Total Number of credits
Basic Sciences(BS)	17.7	31	29.5
Engineering Sciences(ES)	7.8	17	13
Humanities and Social Sciences (HS)	6.0	16	10
Professional Electives(EL)	9.0	15	15
Program Core+Program Lab (PC+PL)	41.0	84	68.5
Program theory with Lab (PW)	2.4	5	4
Open Electives (OE)	3.6	6	6
Talent Enhancement (TE)	2.4	8	4
Project (PJ)	4.2	14	7
Training & Placement (TP)	4.2	14	7
Internships/Seminars (IS)	1.8	-	3
Mandatory Courses (MC)	NA	2	NA
Total number of Credits		212	167

PROGRAMME OUTCOMES(POs)

PROGRAM OUTCOME REPRESENTS THE KNOWLEDGE, SKILLS AND ATTITUDES THAT THE STUDENTS WOULD BE EXPECTED TO HAVE AT THE END OF THE 4 YEAR ENGINEERING DEGREE PROGRAM





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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING ME BIG DATA ANALYTICS

Institution

Vision/Mission

Vision

To be identified as a “Centre of Excellence” with high standards of Knowledge Dissemination and Research opportunities and to transform the students to imbibe qualities of technical expertise of international standards and high levels of ethical values, who in turn shall contribute to the advancement of society and human kind.

Mission

We shall dedicate and commit ourselves to attain and maintain excellence in Technical Education through commitment and continuous improvement of infrastructure and equipment and provide an inspiring environment for Learning, Research and Innovation for our students to transform them into complete human beings with ethical and social values.

Quality Policy

We at Sri Sai Ram Institute of Technology are committed to build a better nation through Quality Education with team spirit. Our students are enabled to excel in all values of Life and become Good Citizens. We continually improve the System, Infrastructure and Services to satisfy the Students, Parents, Industry and Society.



DEPARTMENT VISION

To be a centre of excellence in educating and graduating Computer Engineers by providing unique environment that foster research, technological, and social enrichment with intellectual knowledge to acquire international standards.

DEPARTMENT MISSION

- M1: Develop high quality Computer Science and Engineering graduates with technical and Professional skills by providing modern infrastructure to acquire international standards.
- M2: Foster research to solve real world problems with emerging Technologies
- M3: Establish center of excellences in collaboration with industries, to meet the changing needs of society
- M4: Inculcate spirit of moral values that contributes to societal ethics

PEO

- PEO 1- Enable students to integrate theory and practice for problem solving.
- PEO 2- Empower students to critically analyze current trends and future issues from a system perspective at multiple levels of detail and abstraction.
- PEO 3- Prepare students to critically analyze existing literature, identify the gaps and propose innovative and research oriented solutions for Big Data.
- PEO 4- Enable students to pursue lifelong multidisciplinary learning as professional engineers and scientists.
- PEO 5- Enable students to effectively communicate technical information, function effectively on teams, and apply computer engineering solutions within a global, societal, and environmental context by following ethical practices.

PSO

- PSO - 1 Ability to Utilize Data Science Principles**
- PSO - 2 Ability to Analyze Data, Software & Programming**
- PSO - 3 Analysis and Interpretation of data**



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SEMESTER 1

S.No	Course Code	Course Title	Hours per week			Total Contact Hours	C
			L	T	P		
THEORY							
1	20PBDMA101	Applied Probability And Statistics	3	1	0	4	4
2	20PBDPC101	Advanced Data Structures And Algorithms	3	0	0	3	3
3	20PBDPC102	Big Data Mining And Analytics	3	0	0	3	3
4	20PBDPC103	Multi Core Architecture	3	0	0	3	3
5	20PBDMC101	Research Methodology and IPR	2	0	0	2	2
6	20PBDMC102	Audit Course – I *	2	0	0	2	0
PRACTICAL							
7	20PBDPL101	Advanced Data Structures Lab	0	0	3	3	1.5
8	20PBDPL102	Big Data Computing Laboratory	0	0	3	3	1.5
TOTAL						23	18



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SEMESTER II

S.No	Course Code	Course Title	Hours per week			Total Contact Hours	C
			L	T	P		
THEORY							
1	20PBDPC201	Foundations Of Data Science	3	1	0	4	4
2	20PBDPC202	Big Data Security	3	0	0	3	3
3	20PBDPC203	Machine Learning Techniques	3	0	0	3	3
4	20PBDPC204	NOSQL Database	3	0	0	3	3
5	20PXXELXX X	Professional Elective I	3	0	0	3	3
6	20PBDMC20 1	Audit Course – II *	2	0	0	2	0
PRACTICAL							
7	20PBDPL20 1	Big Data Query Languages Laboratory	0	0	3	3	1.5
8	20PBDPL20 2	Machine Learning Techniques Laboratory	0	0	3	3	1.5
VALUE ADDITIONS-V							
9	20PBDTE20 1	Innovative Design Project	0	0	2	2	1
TOTAL						26	20



SEMESTER III

S.No	Course Code	Course Title	Hours per week			Total Contact Hours	C
			L	T	P		
THEORY							
1	20PXXOEX XX	OPEN ELECTIVE	3	0	0	3	3
2	20PXXPEXX X	ELECTIVE II	3	0	2	5	4
3	20PXXELXX X	ELECTIVE III	3	0	0	3	3
4	20PXXELXX X	ELECTIVE IV	3	0	0	3	3
PRACTICAL							
5	20PBDPJ301	PROJECT WORK PHASE I	0	0	12	12	6
TOTAL						26	19

SEMESTER IV

S.No	Course Code	Course Title	Hours per week			Total Contact Hours	C
			L	T	P		
PRACTICAL							
1	20P BD PJ 401	PROJECT WORK PHASE II	0	0	24	24	12
TOTAL						24	12



PROFESSIONAL ELECTIVES I

S.No	Course Code	Course Title	Hours per week			Total Contact Hours	C	Stream
			L	T	P			
1	20PBDEL201	HIGH PERFORMANCE COMPUTING	3	0	0	3	3	Cloud Computing
2	20PBDEL202	SERVICE ORIENTED ARCHITECTURE	3	0	0	3	3	Cloud computing
3	20PBDEL203	INFORMATION RETRIEVAL TECHNIQUES	3	0	0	3	3	Data science
4	20PBDEL204	DISTRIBUTED SYSTEMS	3	0	0	3	3	Cloud computing
5	20PBDEL205	INTERNET OF THINGS	3	0	0	3	3	IoT
6	20PBDEL206	COMPUTATIONAL GEOMETRY	3	0	0	3	3	Data science

PROFESSIONAL ELECTIVES II

S.No.	Course Code	Course Title	Hours per week			Total Contact Hours	C	Stream
			L	T	P			
1	20PBDEL301	SOFT COMPUTING	3	0	0	3	3	Cloud computin



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2	20PBDEL302	MULTIMEDIA COMMUNICATION NETWORKS	3	0	0	3	3	Cloud computing
3	20PBDEL303	PARALLEL AND DISTRIBUTED COMPUTING	3	0	0	3	3	Cloud computing
4	20PBDEL304	PREDICTIVE MODELLING	3	0	0	3	3	Data science
5	20PBDEL305	IMAGE PROCESSING AND ANALYSIS	3	0	0	3	3	Data science
6	20PBDEL306	CLOUD SOURCED DATA AND STORAGE	3	0	0	3	3	Data Science

PROFESSIONAL ELECTIVES III

S.No.	Course Code	Course Title	Hours per week			Total Contact Hours	C	Stream
			L	T	P			
1	20PBDEL307	DEEP LEARNING	3	0	0	3	3	Data science
2	20PBDEL308	COGNITIVE COMPUTING	3	0	0	3	3	Cloud computing
3	20PBDEL309	SOCIAL NETWORK ANALYSIS	3	0	0	3	3	Cyber Security
4	20PBDEL310	VIRTUALIZATION TECHNIQUES AND APPLICATIONS	3	0	0	3	3	Cloud computing
5	20PBDEL311	NATURAL LANGUAGE PROCESSING	3	0	0	3	3	Data Science



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6	20PBDEL312	EXPLORATORY DATA ANALYSIS IN R	3	0	0	3	3	Data Science
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PROFESSIONAL ELECTIVES IV

S.No.	Course Code	Course Title	Hours per week			Total Contact Hours	C	Stream
			L	T	P			
1	20PBDEL313	DATA INTENSIVE COMPUTING	3	0	0	3	3	Cloud computin g
2	20PBDEL314	R LANGUAGE FOR MINING	3	0	0	3	3	Data science
3	20PBDEL315	WEB ANALYTICS	3	0	0	3	3	Data science
4	20PBDEL316	BIOINFORMATICS	3	0	0	3	3	Data science
5	20PXXELXX X	STATISTICS FOR BUSINESS ANALYTICS	3	0	0	3	3	Data science
6	20PBDEL317	REINFORCEMENT LEARNING	3	0	0	3	3	Data science

OPEN ELECTIVES

S.No.	Course Code	Course Title	Hours per week			Total Contact Hours	C
			L	T	P		
1	20PBDOE301	BUSINESS DATA ANALYTICS	3	0	0	3	3
2	20PBDOE302	INDUSTRIAL SAFETY	3	0	0	3	3
3	20PBDOE303	OPERATIONS	3	0	0	3	3



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		RESEARCH					
4	20PBDOE304	COST MANAGEMENT OF ENGINEERING PROJECTS	3	0	0	3	3
5	20PBDOE305	COMPOSITE MATERIALS	3	0	0	3	3
6	20PBDOE306	WASTE TO ENERGY	3	0	0	3	3

AUDIT COURSES (AC)

Registration for any of these courses is optional to students

S.No.	Course Code	Course Title	Periods per week			Credits
			L	T	P	
1	20PBDMCXX X	English for Research Paper Writing	2	0	0	0
2	20PBDMCXX X	Disaster Management	2	0	0	0
3	20PBDMCXX X	Sanskrit for Technical Knowledge	2	0	0	0
4	20PBDMCXX X	Value Education	2	0	0	0
5	20PBDMCXX X	Constitution of India	2	0	0	0



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6	20PBDMCXX X	Pedagogy Studies	2	0	0	0
7	20PBDMCXX X	Stress Management by Yoga	2	0	0	0
8	20PBDMCXX X	Personality Development Through Life Enlightenment Skills	2	0	0	0
9	20PBDMCXX X	Unnat Bharat Abhiyan	2	0	0	0
Total Credits						0

20PBDMA101 APPLIED PROBABILITY AND STATISTICS SDG NO 4

L T P C
3 1 0 4

OBJECTIVES:

- To provide the solid foundation on topics in applied probability and various statistical methods which form the basis for many other areas in the mathematical sciences including statistics, modern optimization methods and risk modeling.
- To introduce the basic concepts of Two dimensional random variables.
- To provide information about estimation theory.
- To learn the concepts of Correlation, Regression and Testing of testing of hypothesis.
- To address the issues and the principles of multivariate normal distribution and principle of components analysis.

UNIT I PROBABILITY AND RANDOM VARIABLES

9

Probability – Axioms of probability – Conditional probability – Baye’s theorem - Random variables - Probability function – Moments – Moment generating functions and their properties – Binomial, Poisson, Geometric, Uniform, Exponential, Gamma and Normal distributions – Function of a random variable.

UNIT II TWO DIMENSIONAL RANDOM VARIABLES

9

Joint distributions – Marginal and conditional distributions – Functions of two dimensional random variables – Regression curve – Correlation.

UNIT III ESTIMATION THEORY

9

Unbiased estimators – Method of moments – Maximum likelihood estimation - Curve fitting by principle of least squares – Regression lines.

UNIT IV TESTING OF HYPOTHESIS

9



Sampling distributions - Type I and Type II errors - Tests based on Normal, t, Chi square and F distributions for testing of mean, variance and proportions – Tests for Independence of attributes and Goodness of fit.

UNIT V MULTIVARIATE ANALYSIS

9

Random Vectors and Matrices - Mean vectors and Covariance matrices - Multivariate Normal density and its properties - Principal Components Population principal components - Principal components from standardized variables.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Devore, J. L., —Probability and Statistics for Engineering and the Sciences, 8th Edition, Cengage Learning, 2014.
2. Dallas E. Johnson, —Applied Multivariate Methods for Data Analysis, Thomson and Duxbury press, 1998.
3. Gupta S.C. and Kapoor V.K., | Fundamentals of Mathematical Statistics, Sultan and Sons, New Delhi, 2001.
4. Johnson, R.A., Miller, I and Freund J., "Miller and Freund's Probability and Statistics for Engineers ", Pearson Education, Asia, 8th Edition, 2015.
5. Richard A. Johnson and Dean W. Wichern, —Applied Multivariate Statistical Analysis, 5th Edition, Pearson Education, Asia, 2002.

REFERENCES:

1. Milton. J. S. and Arnold. J.C., "Introduction to Probability and Statistics", Tata McGraw Hill, 4th Edition, 2007.
2. Johnson, R.A., Miller, I and Freund J., "Miller and Freund's Probability and Statistics for Engineers ", Pearson Education, Asia, 8th Edition, 2015.
3. Papoulis. A and Unnikrishnapillai. S., "Probability, Random Variables and Stochastic Processes " McGraw Hill Education India , 4th Edition, New Delhi , 2010.

OUTCOMES:

Upon completion of the course, the student should be able to:

1. Basic probability axioms and rules and the moments of discrete and Continuous random variables.
2. Consistency, efficiency and unbiasedness of estimators, method of Maximum likelihood estimation and Central Limit Theorem.
3. Use statistical tests in testing hypotheses on data.
4. Perform exploratory analysis of multivariate data, such as multivariate normal density, calculating descriptive statistics, testing for multivariate normality.
5. The students should have the ability to use the appropriate and relevant, fundamental and applied mathematical and statistical knowledge, methodologies and modern computational tools.

CO-PO MAPPING:



Sri

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DEPARTMENT OF
**COMPUTER & COMMUNICATION
ENGINEERING**

REGULATIONS
2020

Academic Year 2020-21 onwards

AUTONOMOUS
CURRICULUM AND

SYLLABUS
I - VIII
SEMESTERS

SRI SAIRAM INSTITUTE OF TECHNOLOGY



VISION

To be identified as a "Centre of Excellence" with high standards of Knowledge Dissemination and Research opportunities and to transform the students to imbibe qualities of technical expertise of international standards and high levels of ethical values, who in turn shall contribute to the advancement of society and human kind.



MISSION

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QUALITY POLICY

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DEPARTMENT OF COMPUTER AND COMMUNICATION ENGINEERING



VISION

To produce globally competent and socially responsible engineers who can address the engineering challenges and excel at an international level, in the advancement of Computer and Communication Engineering through research and academia.



MISSION

- M1 To provide a good environment with latest technological infrastructure facilities, teaching-learning ambience and interaction with industry in the area of Computer and Communication Engineering .
- M2 To inculcate graduates with high social responsibility, right attitude, discipline and an inclination towards offering their professional expertise in serving the society.

AUTONOMOUS CURRICULA AND SYLLABI Regulations 2020

SEMESTER I

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA101	Engineering Mathematics-I	3	1	0	4	4
2	20HSEN101	Technical English-I	3	0	0	3	3
3	20BSPH101	Engineering Physics	3	0	0	3	3
4	20BSCY101	Engineering Chemistry	3	0	0	3	3
5	20ESCS101	Problem solving and Programming in C	3	0	0	3	3
6	20ESGE101	Engineering Graphics	1	2	0	3	3
PRACTICAL							
7	20BSPL101	Physics and Chemistry Laboratory	0	0	3	3	1.5
8	20ESPL101	Programming in C Laboratory	0	0	3	3	1.5
VALUE ADDITIONS - I							
9	20TPHS101	Skill Enhancement	0	0	2	2	1
10	20HSMG101	Personal Values	2	0	0	2	0
TOTAL						29	23

SEMESTER II

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA201	Engineering Mathematics -II	3	1	0	4	4
2	20HSEN201	Technical English - II	3	0	0	3	3
3	20ESIT201	Python Programming with lab	3	0	2	5	4
4	20BSPH201	Physics of Electronic Devices	3	0	0	3	3
4	20BSCY201	Environmental Science and Engineering	3	0	0	3	3
PRACTICAL							
6	20ESGE201	Engineering Practices Laboratory	0	0	3	3	1.5
7	20ECPL201	Circuits and Devices Laboratory	0	0	3	3	1.5
8	20ECTE201	PCB Design	0	0	2	2	1
VALUE ADDITIONS - II							
9	20TPHS201	Skill Enhancement	0	0	2	2	1
10	20HSMG201	Interpersonal Values	2	0	0	2	0
TOTAL						30	22

SEMESTER III

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20ITPC301	Data Structures	3	0	0	3	3
2	20CCPC301	Digital logics and system design	3	0	0	3	3
3	20ECPC303	Signals and Systems	3	1	0	4	4
4	20ITPC303	Computer Organization & Architecture	3	0	0	3	3
5	20BSMA301	Linear Algebra, PDE and Transforms	3	1	0	4	4
PRACTICAL							
6	20ITPL301	Data Structures Laboratory	0	0	3	3	1.5
7	20CCPL301	Digital Circuits Laboratory	0	0	3	3	1.5
8	20CCTE301	Live-in-Lab - 1	0	0	2	2	1
VALUE ADDITIONS - III							
9	20CCTP301	Skill Enhancement	0	0	2	2	1
10	20MGMC301	Constitution of India	2	0	0	2	0
TOTAL						29	22

SEMESTER IV

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20CCPC401	Analog and Digital Communication	3	0	0	3	3
2	20CSPC402	Data Base Management system	3	0	0	3	3
3	20CCPW401	Operating Systems with Lab	3	0	2	5	4
4	20ECPC302	Electromagnetic Fields and Waveguides	3	1	0	4	4
5	20BSMA401	Probability Theory & Stochastic Processes	3	1	0	4	4
PRACTICAL							
6	20CCPL401	Communication System Lab	0	0	3	3	1.5
7	20CSPL402	Database Management Systems Laboratory	0	0	3	3	1.5
8	20CCTE401	Live-in-Lab -II	0	0	2	2	1
VALUE ADDITIONS - IV							
9	20CCTP401	Skill Enhancement	0	0	2	2	1
TOTAL						29	23

SEMESTER V

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20CSPC301	Object Oriented Programming	3	0	0	3	3
2	20ECPC402	Microcontrollers & Embedded systems	3	0	0	3	3
3	20CSPW401	Computer Networks (with Lab)	3	0	0	3	3
4	20XXELXXX	Professional Elective-1	3	0	0	3	3
5	20XXOEXXX	Open Elective-1	3	0	0	3	3
PRACTICAL							
6	20ECPL401	Microcontrollers & Embedded Systems Laboratory	0	0	3	3	1.5
7	20CSPL301	Object Oriented Programming Lab	0	0	3	3	1.5
8	20CCTE501	Live-in-Lab III	0	0	4	4	2
VALUE ADDITIONS - V							
9	20CCTP501	Skill Enhancement	0	0	2	2	1
TOTAL						29	22

SEMESTER VI

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20ECPW501	Discrete Time Signal Processing (with Lab)	3	0	2	5	4
2	20CSPC403	Object oriented Software Engineering	3	0	0	3	3
3	20CSPC601	Artificial Intelligence	3	0	0	3	3
4	20CCPW601	Wireless Communication & Computing with Laboratory	3	0	2	5	4
5	20XXELXXX	Professional Elective-2	3	0	0	3	3
6	20XXOEXXX	Open Elective-2	3	0	0	3	3
PRACTICAL							
7	20HSPL501	Communication and Soft Skills Lab	0	0	2	2	1
8	20CSPL601	Artificial Intelligence laboratory	0	0	3	3	1.5
9	20CCPJ601	Innovative Design Project	0	0	2	2	1
VALUE ADDITIONS - VI							
10	20CCTP601	Skill Enhancement	0	0	2	2	1
TOTAL						31	23.5

SEMESTER VII

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20CCPW701	Cryptography & Network security with Laboratory	3	0	2	5	4
2	20CSPC603	Big Data Analytics	3	0	0	3	3
3	20ITPC601	Cloud computing and Virtualization	3	0	0	3	3
4	20CCPC601	Mobile Communication	3	0	0	3	3
5	20XXELXXX	Professional Elective-3	3	0	0	3	3
6	20HSMG601	Principles of Engineering Management	3	0	0	3	3
PRACTICAL							
7	20CCPL701	Big Data Analytics Laboratory	0	0	3	3	1.5
8	20CCPJ701	Project Phase -1	0	0	4	4	2
VALUE ADDITIONS - VII							
9	20CCTP701	Skill Enhancement	0	0	2	2	1
TOTAL						29	23.5

SEMESTER VIII

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20XXELXXX	Professional Elective - 4	3	0	0	3	3
PRACTICAL							
2	20CCPJ801	Project Phase - II	0	0	8	8	4
TOTAL						11	7

CREDIT DISTRIBUTION

Category	BS	ES	HS	EL	PC+PL	PW	OE	TE	PJ	TP	IS	MC	TOTAL
Credit	29.5	13	10	12	57.5	20	6	5	7	7	3	Y	170
Percentage	17.3	7.6	5.8	7.0	33.8	11.7	3.5	2.9	4.1	4.1	1.7	-	

*IS-Internship

PROFESSIONAL ELECTIVES - I

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20CSPC501	Internet Programming	3	0	0	3	3	Web Development
2	20CSEL501	Data Warehousing and Data Mining	3	0	0	3	3	Data Mining
3	20CCEL503	Embedded Real Time Systems	3	3	0	0	3	Embedded
4	20CCEL504	System on chip Architecture	3	0	0	3	3	Embedded
5	20MGEL505	Foundation skills in Integrated product Development	3	0	0	3	3	Product Development
6	20CSEL607	Agile Methodologies	3	0	0	3	3	Software Engineering
7	20CCEL507	Computational Linguistics	3	3	0	0	3	Natural Language Processing
8	20CCEL508	Distributed Database	3	3	0	0	3	Data Base
9	20ECEL709	Digital image processing	3	3	0	0	3	Image Processing
10	20CCEL510	Sensor Networks and IOT	3	3	0	0	3	Wireless Network

PROFESSIONAL ELECTIVES - II

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20CCEL601	Wireless Sensor Networks	3	0	0	3	3	Wireless
2	20ECEL701	Cognitive Radio	3	0	0	3	3	Wireless
3	20CCEL602	Networking Engineering and Management	3	0	0	3	3	Network
4	20ECEL502	Industrial IOT	3	0	0	3	3	IoT
5	20CSEL704	Natural Language Processing	3	0	0	3	3	NLP
6	20MGEL601	Total Quality Management	3	0	0	3	3	Management
7	20CCEL603	Advanced Data Structures & Algorithms	3	0	0	3	3	Data Structure
8	20ITEL608	Software Testing	3	0	0	3	3	Software Engineering
9	20CCEL604	Infometrics	3	0	0	3	3	Data Mining
10	20CSEL702	Software Defined Networks	3	0	0	3	3	Network

PROFESSIONAL ELECTIVES - III

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20CCEL701	Adhoc Sensor Networks	3	0	0	3	3	Sensor Networks
2	20CCEL702	Human Computer Interaction	3	0	0	3	3	User Interface
3	20CCEL703	Quantum Computing	3	0	0	3	3	Cloud
4	20EPC702	Optical Communication	3	0	0	3	3	Wireless
5	20CCEL704	Data Base security and privacy	3	0	0	3	3	Security
6	20CCEL705	Parallel Architecture & Algorithms	3	0	0	3	3	Cloud
7	20CSPC602	Compiler Design	3	0	0	3	3	Compiler
8	20ITEL710	Service oriented Architecture	3	0	0	3	3	Cloud
9	20CCEL706	Advanced Wireless Communication	3	0	0	3	3	Wireless
10	20CCEL707	Principles of Multimedia	3	0	0	3	3	Multimedia

PROFESSIONAL ELECTIVES - IV

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20CCEL801	Hardware Software Codesign	3	0	0	3	3	Design
2	20CCEL802	Fuzzy Logic & Neural Networks	3	0	0	3	3	Fuzzy Logic
3	20CSPC702	Machine Learning Techniques	3	0	0	3	3	Machine Learning
4	20ECEL803	Satellite Communication	3	0	0	3	3	Wireless
5	20CCEL803	Ethical Hacking and Digital Forensics	3	0	0	3	3	Ethical Hacking
6	20HSMG301	Professional Ethics & Values	3	0	0	3	3	Management
7	20CCEL804	Database Tuning	3	0	0	3	3	Database
8	20CCEL805	Android Application Development	3	0	0	3	3	Mobile Development
9	20CSEL706	Multi-core Architectures & Programming	3	0	0	3	3	Parallel Processing
10	20CSEL806	Cognitive Science	3	0	0	3	3	Artificial Intelligence

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- PEO 1** Impart strong foundation in basic sciences, mathematics and engineering fundamentals, knowledge and capability.
- PEO2** Apply design principles and best practices for developing quality products for scientific and business applications.
- PEO 3** Inculcate high professionalism among the students by providing technical and soft skills with ethical standards.
- PEO 4** Promote collaborative learning and spirit of team work through multidisciplinary projects and diverse professional activities.
- PEO 5** Indoctrinate an attitude in the graduates for life- long learning process.

PROGRAM SPECIFIC OUTCOMES (PSOs)

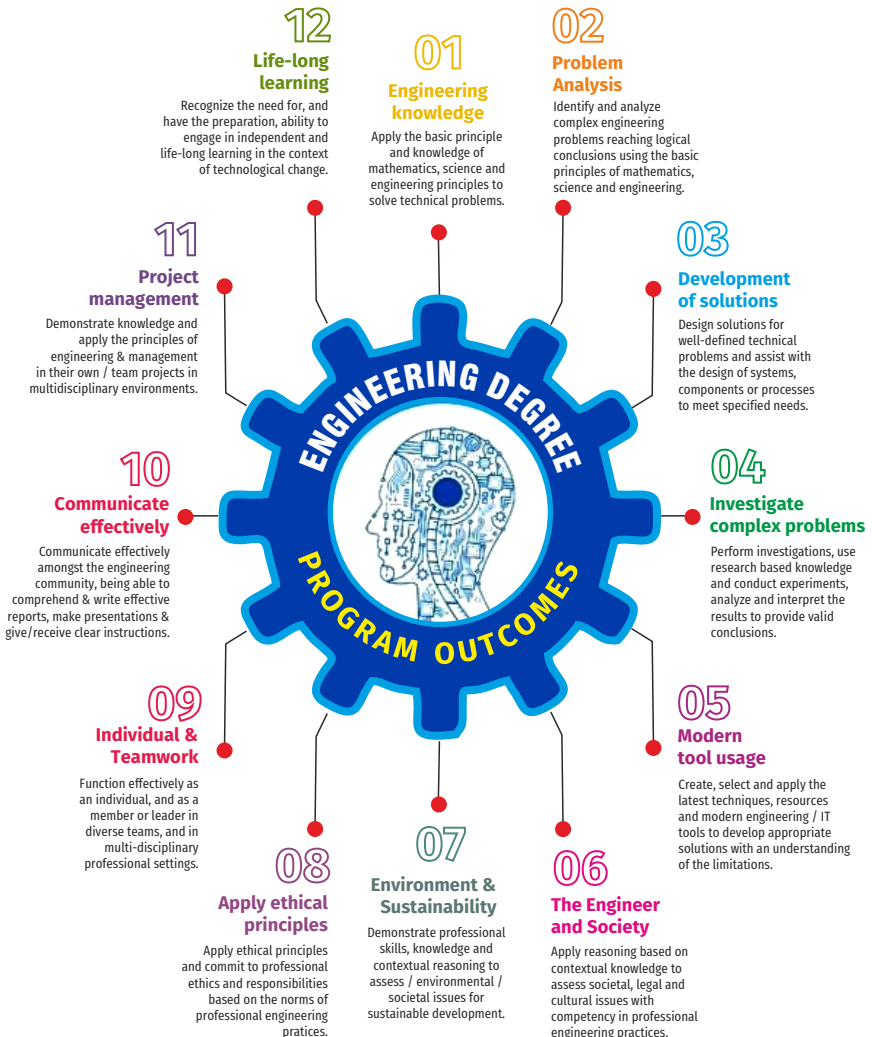
- PSO 1** Apply appropriate technology for the implementation of modern communication systems
- PSO2** Develop quality software for scientific and business applications by applying software engineering principles and practices .

COMPONENTS OF THE CURRICULUM (COC)

Course Component	Curriculum Content (% of total number of credits of the program)	Total number of contact hours	Total Number of credits
Basic Sciences(BS)	17.3	31	29.5
Engineering Sciences(ES)	7.6	17	13
Humanities and Social Sciences (HS)	5.8	15	10
Professional Electives(EL)	7.0	12	12
Program Core+Program Lab (PC+PL)	33.8	71	57.5
Program theory with Lab (PW)	11.7	20	20
Open Electives (OE)	3.5	06	6
Talent Enhancement (TE)	2.9	10	5
Project (PJ)	4.1	14	7
Training & Placement (TP)	4.1	14	7
Internships/Seminars (IS)	1.7	-	3
Mandatory Courses (MC)	NA	02	NA
Total number of Credits		217	170

PROGRAMME OUTCOMES(POs)

PROGRAM OUTCOME REPRESENTS THE KNOWLEDGE, SKILLS AND ATTITUDES THAT THE STUDENTS WOULD BE EXPECTED TO HAVE AT THE END OF THE 4 YEAR ENGINEERING DEGREE PROGRAM





Sri

SAI RAM
ENGINEERING COLLEGE

An Autonomous Institution

West Tambaram, Chennai - 44

www.sairam.edu.in

Approved by AICTE, New Delhi
Affiliated to Anna University



DEPARTMENT OF
**ARTIFICIAL INTELLIGENCE &
DATA SCIENCE ENGINEERING**

REGULATIONS
2020

Academic Year 2020-21 onwards

AUTONOMOUS
CURRICULUM AND

SYLLABUS
I - VIII
SEMESTERS

SRI SAIRAM ENGINEERING COLLEGE



VISION

To emerge as a “Centre of excellence” offering Technical Education and Research opportunities of very high standards to students, develop the total personality of the individual and instil high levels of discipline and strive to set global standards, making our students technologically superior and ethically stronger, who in turn shall contribute to the advancement of society and humankind.



MISSION

We dedicate and commit ourselves to achieve, sustain and foster unmatched excellence in Technical Education. To this end, we will pursue continuous development of infra-structure and enhance state-of-the-art equipment to provide our students a technologically up-to date and intellectually inspiring environment of learning, research, creativity, innovation and professional activity and inculcate in them ethical and moral values.



QUALITY POLICY

We at Sri Sai Ram Engineering College are committed to build a better Nation through Quality Education with team spirit. Our students are enabled to excel in all values of Life and become Good Citizens. We continually improve the System, Infrastructure and Service to satisfy the Students, Parents, Industry and Society.

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE ENGINEERING



VISION

To emerge as a “Centre of Excellence in the field of Artificial Intelligence and Data Science”, The Department is committed to inculcate discipline, offering best Technical Education and Research Opportunities and ethically strong to meet the global challenges, who in turn shall contribute to the advancement and welfare of the society.



MISSION

Department of Artificial Intelligence and Data Science Engineering, Sri Sairam Engineering College is committed to

- M1** Produce students with a sound understanding of the fundamentals of the theory and practise of Artificial Intelligence, Machine Learning and Data Science.
- M2** Enable students to become leaders in the Industry and Academia Nationally as well as Internationally.
- M3** Meet the pressing demands of the nation in the areas of Artificial Intelligence and Data Science.

AUTONOMOUS CURRICULUM AND SYLLABI

Regulations 2020

SEMESTER I

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA101	Engineering Mathematics-I	3	1	0	4	4
2	20HSEN101	Technical English-I	3	0	0	3	3
3	20BSPH101	Engineering Physics	3	0	0	3	3
4	20BSCY101	Engineering Chemistry	3	0	0	3	3
5	20ESCS101	Problem solving and Programming in C	3	0	0	3	3
6	20ESGE101	Engineering Graphics	1	2	0	3	3
PRACTICAL							
7	20BSPL101	Physics and Chemistry Laboratory	0	0	3	3	1.5
8	20ESPL101	Programming in C Laboratory	0	0	3	3	1.5
VALUE ADDITIONS - I							
9	20TPHS101	Skill Enhancement	0	0	2	2	1
10	20HSMG101	Personal Values	2	0	0	2	0
TOTAL						29	23

SEMESTER II

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA204	Discrete Structures	3	1	0	4	4
2	20HSEN201	Technical English – II	3	0	0	3	3
3	20BSPH203	Physics for Information Science	3	0	0	3	3
4	20BSCY201	Environmental Science and Engineering	3	0	0	3	3
5	20ESIT202	Python Programming	3	0	0	3	3
6	20CBPC201	Data Structures & Algorithms	3	0	0	3	3
PRACTICALS							
7	20ESPL201	Python Programming Laboratory	0	0	3	3	1.5
8	20CBPL202	Data Structures & Algorithms Laboratory	0	0	3	3	1.5
9	20ESGE201	Engineering Practices Laboratory	0	0	3	3	1.5
VALUE ADDITIONS - II							
10	20TPHS201	Skill Enhancement	0	0	2	2	1
11	20HSMG201	Interpersonal Values	2	0	0	2	0
TOTAL						32	24.5

SEMESTER III

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA302	Probability & Statistical Modelling	3	1	0	4	4
2	20CSPC401	Operating Systems	3	0	0	3	3
3	20CSPC402	Database Management Systems	3	0	0	3	3
4	20AIPW301	Fundamental of Data Science with lab	3	0	2	5	4
5	20AIPC302	Fundamental of Machine Learning Techniques	3	0	0	3	3
PRACTICAL							
6	20AIPL301	Probability & Statistical Modelling Laboratory	0	0	3	3	1.5
7	20CSPL402	Database Management Systems Laboratory	0	0	3	3	1.5
8	20AIPL302	Machine Learning Laboratory	0	0	3	3	1.5
VALUE ADDITIONS - III							
9	20AITE301	Live-in-Lab – 1	0	0	2	2	1
10	20AI TP 301	Skill Enhancement	0	0	2	2	1
TOTAL						31	23.5

SEMESTER IV

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20BSMA404	Linear Algebra and its Applications	3	1	0	4	4
2	20ITPC401	Design and Analysis of Algorithms	3	0	0	3	3
3	20CSPW401	Computer Networks with Lab	3	0	2	5	4
4	20AIPC401	Fundamentals of Artificial Intelligence	3	0	0	3	3
5	20AIPC402	Biomedical Signal & Image Processing	3	0	0	3	3
6	20AIPC403	Advanced Machine Learning	3	0	0	3	3
PRACTICAL							
7	20AIPL401	DAA and AI Laboratory	0	0	3	3	1.5
8	20AIPL402	Biomedical Signal & Image Processing Laboratory	0	0	3	3	1.5
9	20AIPL403	Advance Machine Learning Laboratory	0	0	3	3	1.5
10	20AITE401	Live-in-Lab – II	0	0	2	2	1
VALUE ADDITIONS - IV							
11	20AITP401	Skill Enhancement	0	0	2	2	1
12	20MGMC301	Constitution of India	2	0	0	2	0
TOTAL						36	26.5

SEMESTER V

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20AIPC501	Computer Vision	3	0	0	3	3
2	20AIPC502	Deep Learning	3	0	0	3	3
3	20AIPC503	Natural language Processing and Chat Bot	3	0	0	3	3
4	20AIPC504	IoT & Sensors Technologies	3	0	0	3	3
5	20AI EL XXX	Professional Elective-I	3	0	0	3	3
PRACTICAL							
6	20AIPL501	Deep Learning Laboratory	0	0	3	3	1.5
7	20AIPL502	NLP & Chatbot Laboratory	0	0	3	3	1.5
8	20AIPL503	IoT Laboratory	0	0	3	3	1.5
VALUE ADDITIONS - V							
9	20AITE501	Live-in-Lab III	0	0	2	2	1
10	20AITP501	Skill Enhancement	0	0	2	2	1
TOTAL						28	21.5

SEMESTER VI

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20AIPC601	Robotics Process Automation	3	0	0	3	3
2	20AIPW602	Big Data Analytics with Lab	3	0	2	5	4
3	20AIPW603	Optimization Techniques for Programming with Lab	3	0	2	5	4
4	20XXELXXX	Professional Elective-II	3	0	0	3	3
5	20XXOEXXX	Open Elective-I	3	0	0	3	3
PRACTICAL							
6	20AIPL601	Robotics Laboratory	0	0	3	3	1.5
7	20HSP501	Communication and Soft Skills Lab	0	0	2	2	1
8	20AIP 601	Innovative Design Project	0	0	2	2	1
VALUE ADDITIONS - VI							
9	20AITP601	Skill Enhancement	0	0	2	2	1
TOTAL						28	21.5

SEMESTER VII

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20AIPC701	Cloud Computing	3	0	0	3	3
2	20HSMG601	Principles of Engineering Management	3	0	0	3	3
3	20XXELXXX	Professional Elective-III	3	0	0	3	3
4	20XXELXXX	Professional Elective-IV	3	0	0	3	3
5	20XXOEXXX	Open Elective-II	3	0	0	3	3
PRACTICAL							
6	20AIPL701	Cloud Computing Laboratory	0	0	3	3	1.5
7	20AIPJ701	Project Phase - I	0	0	4	4	2
VALUE ADDITIONS - VII							
8	20AITP701	Skill Enhancement	0	0	2	2	1
TOTAL						24	19.5

SEMESTER VIII

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDITS
			L	T	P		
THEORY							
1	20XXOEXXX	Open Electives - III	3	0	0	3	3
PRACTICAL							
2	20AIPJ801	Project Phase - II	0	0	8	8	4
TOTAL						11	7

CREDIT DISTRIBUTION

Category	BS	ES	HS	EL	PC+PL	PW	OE	TE	PJ	TP	IS	MC	TOTAL
Credit													
Percentage													

*IS-Internship

PROFESSIONAL ELECTIVES - I

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20AIEL501	Control Systems	3	0	0	3	3	Mathematics
2	20AIEL502	Software Engineering	3	0	0	3	3	Testing
3	20AIEL503	Distributed Systems	3	0	0	3	3	Cloud
4	20AIEL504	Intellectual Property Rights and Design Thinking	3	0	0	3	3	Cloud
5	20AIEL505	Social Network Analysis	3	0	0	3	3	Automation
6	20AIEL506	Software Project Management	3	0	0	3	3	AI
7	20AIEL507	Human Computer Interaction	3	0	0	3	3	Machine Learning
8	20AIEL508	Embedded Systems	3	0	0	3	3	Data Science
9	20AIEL509	Ethics in Data Science	3	0	0	3	3	
10	20AIEL510	Principles of Computer Security						AI

PROFESSIONAL ELECTIVES - II

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20AIEL601	Etical Hacking and system defence	3	0	0	3	3	Security
2	20AIEL602	Wireless Sensor Networks	3	0	0	3	3	Management
3	20AIEL603	Information Retrieval Techniques	3	0	0	3	3	Data Mining
4	20AIEL604	Fundamentals of AI for Robotics	3	0	0	3	3	Robotics
5	20AIEL605	Cryptography and Network security	3	0	0	3	3	Security
6	20AIEL606	Statistics for Business Analytics	3	0	0	3	3	Mathematics
7	20AIEL607	Fuzzy COntrl Systems	3	0	0	3	3	AI
8	20AIEL608	Agent Based Intelligent System	3	0	0	3	3	AI
9	20AIEL609	Biomedical Instrumentation	3	0	0	3	3	AI
10	20AIEL610	Robotic Sensors	3	0	0	3	3	Security

PROFESSIONAL ELECTIVES - III

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20AIEL701	Block Chain Technology	3	0	0	3	3	Security
2	20AIEL702	Financial Management	3	0	0	3	3	Management
3	20AIEL703	Virtual Reality and Augmented Reality	3	0	0	3	3	AI
4	20AIEL704	Security Risk Assessment and Management	3	0	0	3	3	Security
5	20AIEL705	Expert System	3	0	0	3	3	AI
6	20AIEL706	Cognitive Computing	3	0	0	3	3	AI
7	20AIEL707	Reinforcement Learning	3	0	0	3	3	AI
8	20AIEL708	Mining Massive Datasets	3	0	0	3	3	Data Science
9	20AIEL709	Database Security and Auditing	3	0	0	3	3	Data Science
10	20AIEL710	Game Theory	3	0	0	3	3	AI

PROFESSIONAL ELECTIVES - IV

S. NO	COURSE CODE	COURSE TITLE	WEEK HOURS			TOTAL CONTACT HOURS	CREDIT	STREAM
			L	T	P			
1	20AIEL711	Cyber Crime & Computer Ethics	3	0	0	3	3	Cyber Security
2	20AIEL712	Quantum Computing and Quantum Cryptography	3	0	0	3	3	AI
3	20AIEL713	Decision Making under Uncertainty	3	0	0	3	3	AI
4	20AIEL714	Artificial Intelligence Search Methods for Problem Solving	3	0	0	3	3	AI
5	20AIEL715	Actuarial Science Applications	3	0	0	3	3	Security
6	20AIEL716	Secure Cloud Computing	3	0	0	3	3	Cloud
7	20AIEL717	Time Series Analysis	3	0	0	3	3	AI
8	20AIEL718	Secure Web App	3	0	0	3	3	Security
9	20AIEL719	Business Intelligence	3	0	0	3	3	AI
10	20AIEL720	Artificial Intelligence Constraint Satisfaction	3	0	0	3	3	AI

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

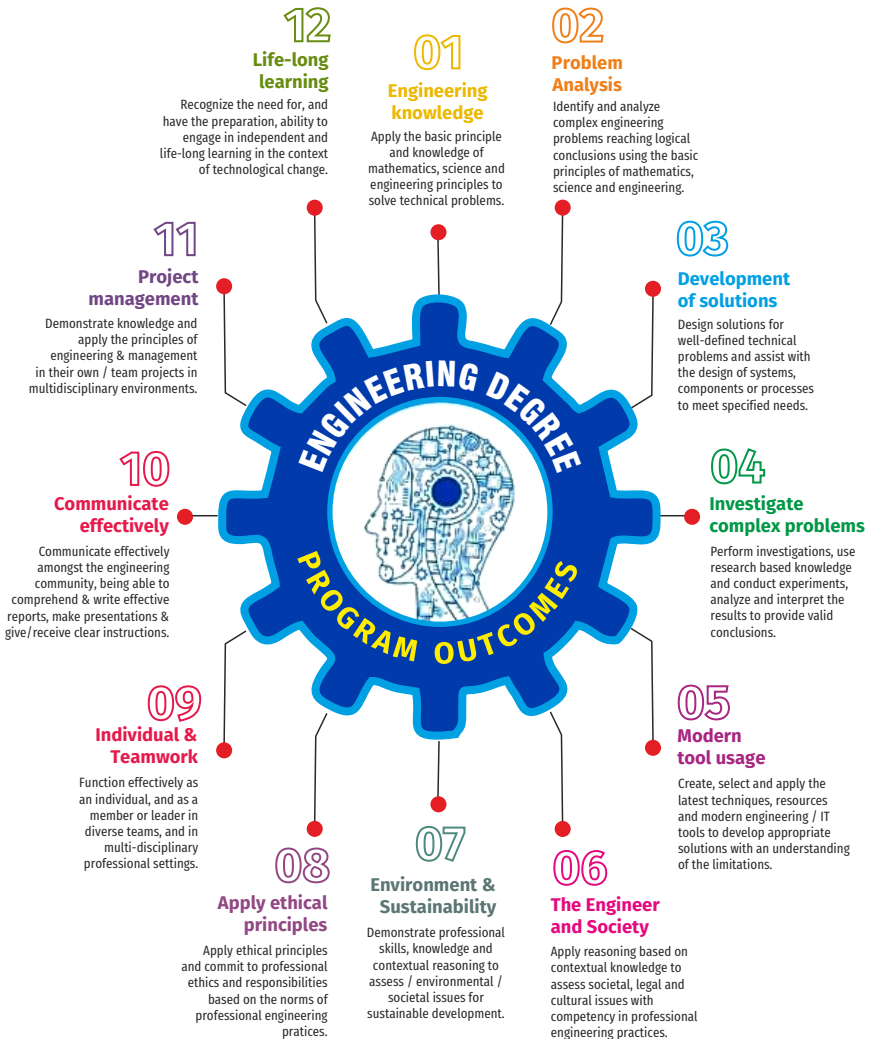
- PEO 1** Graduates will have solid basics in Mathematics, Programming, Machine Learning, Artificial Intelligence and Data Science fundamentals and advancements to solve technical problems.
- PEO2** Graduates will have the capability to apply their knowledge and skills acquired to solve the issues in real world Artificial Intelligence and Data Science sectors and to develop feasible and viable systems.
- PEO3** Graduates will have the potential to participate in life-long learning through the successful completion of advanced degrees, continuing education, certifications and/or other professional developments.
- PEO4** Graduates will have the ability to apply the gained knowledge to improve the society ensuring ethical and moral values.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- PSO 1** Artificial Intelligence and Data Science graduates are able to become leaders in the Industry and Academia with the help of advanced knowledge and skill, which can empower them to analyse, design, develop and implement their learning to develop the society.
- PSO2** Ability to develop skills to address and solve social and environmental problem with ethics and perform multidisciplinary projects with advanced technologies and tools.

PROGRAMME OUTCOMES(POs)

PROGRAM OUTCOME REPRESENTS THE KNOWLEDGE, SKILLS AND ATTITUDES THAT THE STUDENTS WOULD BE EXPECTED TO HAVE AT THE END OF THE 4 YEAR ENGINEERING DEGREE PROGRAM





Autonomous Syllabus for P.G Course

REGULATIONS 2020 :: M.E. INDUSTRIAL SAFETY ENGINEERING

I TO IV SEMESTERS (FULL TIME) CURRICULUM AND SYLLABUS

SEMESTER – I

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.	20PISMA101	Probability and Statistical Methods	MA	3	3	0	0	3
2.	20PISPC101	Principles of Safety Management	PC	3	3	0	0	3
3.	20PISPC102	Environmental Safety	PC	3	3	0	0	3
4.	20PISPC103	Occupational Health and Industrial Hygiene	PC	3	3	0	0	3
5.	20PISPC104	Industrial Safety, Health and Environment Acts	PC	3	3	0	0	3
6.	20PISPE1XX	Professional Elective I	PE	3	3	0	0	3
PRACTICAL								
7.	20PISEE101	Industrial safety and Hazard analysis case studies & Report writing	EE	2	0	0	2	1
8.	20PISEE102	Skill Development Training	EE	2	0	0	2	1
9.	20PISTE101	Innovative Safety Engineering Design-Live –In - Project - I	TE	2	0	0	3	1.5
TOTAL				26	18	0	7	21.5

SL. NO.	COURSE CODE	COURSE TITLE	SEME- II	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY									
1.	20PISPC201	Fire Engineering and Explosion Control		PC	3	3	0	0	3
2.	20PISPC202	Computer Aided Hazard Analysis		PC	3	3	0	0	3
3.	20PISPC203	Electrical Safety		PC	3	3	0	0	3
4.	20PISPC204	Safety in Chemical Industries		PC	3	3	0	0	3
5.	20PISPC205	Machine Learning & Artificial Intelligence for Industrial Safety		PC	3	3	0	0	3
6.	20PISEL2XX	Professional Elective II		PE	3	3	0	0	3
PRACTICAL									
7.	20PISPL201	Industrial Safety Laboratory		PL	3	0	0	3	1.5

28	20PISTE201	Innovative Safety Engg. Design live –in Project - II	TE	4	0	0	4	2
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VALUE ADDED COURSES

9.	20PISTP201	Internship (Industrial Safety Assessment / Audit)and report Submission	TP	2	0	0	2	1
TOTAL				27	18	0	09	22.5

.5.5

SEMESTER III

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.	20PISPC301	Safety in Engineering Industry 4.0	PC	3	3	0	0	3
2.	20PISEL3XX	Professional Elective III	EL	3	3	0	0	3
3.	20PISEL3XX	Professional Elective IV	EL	3	3	0	0	3
PRACTICAL								
4.	20PISPJ301	Project Work Phase I	PJ	12	0	0	12	6
5.	20PISTP301	Data Analytics in safety engineering & Art of Journal Publication	TE	3	0	0	3	1
TOTAL				24	9	0	16	16

SEMESTER IV

SL. NO	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
PRACTICAL								
1.	20PISPJ401	Project Work Phase II	PJ	20	0	0	20	10
TOTAL				20	0	0	20	10

TOTAL CREDITS = 70

CATEGORY WISE CREDITS

SL. NO.	CATEGORY	Total Credits
1.	BASIC SCIENCE (BS)	03
2	PROFESSIONAL CORE (PC)	30
3	PROFESSIONAL LABORATORY(PL)	01
4	TRAINING AND PLACEMENT (TP)	03
5	TALENT ENABLING COURSES (TE)	05
6	ELECTIVES (EL)	12
7	PROJECT WORK (PJ)	16
	TOTAL	70

LIST OF ELECTIVES FOR M.E. INDUSTRIAL SAFETY ENGINEERING

SEMESTER I (Elective I)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20PISEL101	Plant Layout and Materials Handling	PE	3	3	0	0	3
2.	20PISEL102	Work Study and Ergonomics	PE	3	3	0	0	3
3.	20PISEL103	Dock Safety	PE	3	3	0	0	3
4.	20PISEL104	Human Factors in Engineering	PE	3	3	0	0	3
5.	20PISEL105	Maintainability Engineering	PE	3	3	0	0	3

SEMESTER II (Elective II)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20PISEL201	Transport Safety	PE	3	3	0	0	3
2.	20PISEL202	Fireworks Safety	PE	3	3	0	0	3
3.	20PISEL203	Safety in Construction	PE	3	3	0	0	3
4.	20PISEL204	Safety in Textile Industry	PE	3	3	0	0	3
5.	20PISEL205	Safety in Mines	PE	3	3	0	0	3

SEMESTER III (Elective III & IV)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20PISEL301	Reliability Engineering	PE	3	3	0	0	3
2.	20PISEL302	Quality control Engineering	PE	3	3	0	0	3
3.	20PISEL303	Disaster Management	PE	3	3	0	0	3
4.	20PISEL304	OHSAS 18000 and ISO 14000	PE	3	3	0	0	3
5.	20PISEL305	Research Methodology & IPR	PE	3	3	0	0	3
6.	20PISEL306	Data Analytics	PE	3	3	0	0	3
7.	20PISEL307	Nuclear Engineering and Safety	PE	3	3	0	0	3
8.	20PISEL308	Robotics in Industry 4.0	PE	3	3	0	0	3
9.	20PISEL309	Radiographic Testing and Radiation Safety	PE	3	3	0	0	3
10	20PISEL310	Corrosion Engineering	PE	3	3	0	0	3

BASIC SCIENCE (BS)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20PISBS101	Probability and Statistical Methods	FC	3	3	0	0	3
Total Credits								3

PROFESSIONAL CORE (PC)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20PISPC101	Principles of Safety Management	PC	3	3	0	0	3
2.	20PISPC102	Environmental Safety	PC	3	3	0	0	3
3.	20PISPC103	Occupational Health and Industrial Hygiene	PC	3	3	0	0	3
4.	20PISPC104	Industrial Safety, Health and Environment Acts	PC	3	3	0	0	3
5.	20PISPC201	Fire Engineering and Explosion Control	PC	3	3	0	0	3
6.	20PISPC202	Computer Aided Hazard Analysis	PC	3	4	0	0	3
7.	20PISPC203	Electrical Safety	PC	3	3	0	0	3
8.	20PISPC204	Safety in Chemical Industries	PC	3	3	0	0	3
9.	20PISPC205	Machine Learning & Artificial Intelligence for Industrial Safety	PC	3	3	0	0	3
10.	20PISPC301	Safety in Engineering Industry	PC	3	3	0	0	3
Total Credits								30

PROFESSIONAL LABORATORY (PL)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20PISPL201	Industrial Safety Laboratory	PL	2	0	0	2	1
Total Credits								01

TRAINING AND PLACEMENT COURSES (TP)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20PISTP101	Industrial safety and Hazard analysis case studies & Report writing	TP	2	0	0	2	1
2.	20PISTP102	Skill Development Training	TP	2	0	0	2	1
3.	20PISTP201	Internship (Industrial Safety Assessment / Audit)and report Submission	TP	2	0	0	2	1
TOTAL Credits								03

TALENT ENABLING COURSES (TE)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20PISTE101	Innovative Safety Engineering Design- Live –In - Project - I	TE	4	0	0	4	2
2.	20PISTE201	Innovative Safety Engineering Design- Live –In - Project - II	TE	4	0	0	4	2
3.	20PISTE301	Practices on Data Analytics in safety engineering & Art of Journal Publication	TE	2	0	0	2	1
Tot Credits								05

PROFESSIONAL ELECTIVE (PE)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	20PISEL1XX	Professional Elective - I	PE	3	3	0	0	3
2.	20PISEL2XX	Professional Elective - II	PE	3	3	0	0	3
3.	20PISEL3XX	Professional Elective - III	PE	3	3	0	0	3
4.	20PISEL3XX	Professional Elective - IV	PE	3	3	0	0	3
Tota Credits								12

PROJECT WORK (PW)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1	20PISPJ301	Project Work Phase I	PJ	12	0	0	12	6
2	20PISPJ401	Project Work Phase II	PJ	20	0	0	20	10

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

- I. Possess a mastery of Health safety and environment knowledge and safety management skills, to reach higher levels in their profession.
- II. Knowledgeable safety Engineer rendering professional expertise to the industrial and societal needs at national and global level subject to legal requirements.
- III. Well communicate the information on Health safety and environment facilitating collaboration with experts across various disciplines so as to create and execute safe methodology in complex engineering activities.

PROGRAMME OUTCOMES (POs)

- PO1. Apply knowledge of Mathematics, Science, Engineering fundamentals and an engineering Specialization for hazard identification, risk assessment, analysis the source of incidents and control of occupational Dieses & hazards.
- PO2. Design, Establish, Implement maintain and continually improve an occupation health and safety management system to improve safety.
- PO3. Conduct investigations on unwanted incidents using e.g. (Root cause analysis, what if analysis) and generate corrective and preventive action to prevent repetition and happening of such incidents.
- PO4. Design complex man, machine, and material handling systems using human factors engineering tools so as to achieve comfort, worker satisfaction, efficiency, error free and safe work practice workplace environment.
- PO5. Function effectively as an individual and as a member or leader in diverse teams and in multi-disciplinary settings so as to provide practical solutions to safety problems.
- PO6. Communicate effectively on occupational health and safety matters among the employees and with society at large.
- PO7. Demonstrate understandingof the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to occupation health and safety practices.
- PO8. Understand andcommit to comply with legal and contractual requirements, professional ethics and responsibilities and general norms of engineering practice.
- PO9. Understand the impact of Health safety and environment solutions on productivity, quality and humanity protection at large.
- PO10. Demonstrate the use of state of the art occupational health and safety practices in controlling risks of complex engineering activities and understand their limitations.

PEO / PO Mapping

Programme Educational Objectives	Programme Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
I	✓		✓							
II		✓		✓	✓		✓			✓
III						✓		✓	✓	

Semester Course wise PEO mapping

		Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
1 YEAR	SEM 1	Probability and Statistical Methods	I		I							
		Principles of Safety Management		II		II	II					
		Environmental Safety						I, III		I, III		I, III
		Occupational Health and Industrial Hygiene						II, III		II, III	II, III	
		Industrial Safety, Health and Environment Acts							II			II
		Professional Elective - I										
		Technical Seminar – I & report writing							II			II
		Skill development training on Fire fighting for Industrial safety.							II			II
		Innovative Safety Engineering Design- Live –							II			II
	SEM 2	Fire Engineering and Explosion Control		II		II	II					
		Computer Aided Hazard Analysis	I		I							
		Electrical Safety		II		II	II					
		Safety in Chemical Industries						III		III	III	
		Machine Learning & Artificial Intelligence in Industrial Safety										
		Professional Elective-II										
		Industrial Safety Laboratory							II			II

		Internship and report Submission							II			II
		Innovative Safety Engineering Design- Live – In - Project - II							II			II
YEAR2	SEM 3	Safety in Engineering Industry	I		I							
		Professional Elective-III	I		I							
		Professional Elective-IV	I		I							
		Project Work Phase I				II,III	II,III	II,III				
		Data Analytics in safety engineering & Art of Journal Publication				II,III	II,III	II,III				
	SEM 4	Project Work Phase II				II,III	II,III	II,III				

20 PISMA101

PROBABILITY AND STATISTICAL METHODS

L T P C

3 0 0 3

OBJECTIVES:

This course is designed to provide the solid foundation on topics in probability and various statistical methods which form the basis for many other areas in the mathematical sciences including statistics, modern optimization methods and risk modeling. It is framed to address the issues and the principles of estimation theory, testing of hypothesis, design of experiments and time series analysis.

UNIT I PROBABILITY AND RANDOM VARIABLES 12

Probability – Axioms of probability – Conditional probability – Bayes’ theorem - Random variables – Probability function – Moments – Moment generating functions and their properties – Binomial, Poisson, Geometric, Uniform, Exponential, Gamma and Normal distributions – Function of a random variable.

UNIT II ESTIMATION THEORY 06

Principle of least squares–Regression–Multiple and partial correlations–Estimation of parameters – Maximum likelihood estimates – Method of moments.

UNIT III TESTING OF HYPOTHESIS 09

Sampling distributions – Small and large samples and problems – Tests based on Normal, t - distribution, Chi - square, Goodness of fit and F – distributions.

UNIT IV DESIGN OF EXPERIMENTS 09

Analysis of variance – Completely randomized design – Randomized block design – Latin square design – 2² Factorial designs.

UNIT V TIMESERIES 09

Characteristics and representation – Moving averages – Exponential smoothing – Auto regressive processes.

TOTAL : 45 PERIODS

REFERENCES:

1. Devore, J. L., "Probability and Statistics for Engineering and Sciences", 8th Edition, Cengage Learning, 2014.
2. Johnson, R.A., Miller, I and Freund J., "Miller and Freund's Probability and Statistics for Engineers, Pearson Education, Asia, 8th Edition, 2015.
3. Anderson, O.D, "Time Series Analysis : Theory and Practice", North - Holland, Amsterdam, 1982.
4. Gupta, S.C and Kapoor, V.K., "Fundamentals of Mathematical Statistics", Sultan and Chand Company, New Delhi, 1999.
5. Montgomery D.C and Johnson, L.A, "Forecasting and Time Series", 6th Edition, McGraw Hill, 1990.