ST. THOMAS COLLEGE (AUTONOMOUS)
THRISSUR, KERALA - 680 001
College with Potential for Excellence
NIRF INDIA Ranking 2021 : 64th
www.stthomas.ac.in

PROGRAMME OUTCOMES
PROGRAMME SPECIFIC OUTCOMES
COURSE OUTCOMES

M.Sc Electronics

Outcomes

At the end of Post Graduate Program at St. Thomas College (Autonomous), a student will have obtained:

PO1	Attained profound Expertise in Discipline
PO2	Acquired Ability to function in multidisciplinary domains
PO3	Attained ability to exercise Research Intelligence in investigations and Innovations
PO4	Learnt Ethical Principles and be committed to Professional Ethics
PO5	Incorporated Self-directed and Life-long Learning
PO6	Obtained Ability to maneuver in diverse contexts with Global Perspective
PO7	Attained Maturity to respond to one's calling

Program Specific Outcomes

At the end of M.Sc. Electronics at St. Thomas College (Autonomous), Thrissur, a student will have developed:

PSO1	Understand different mathematical tools for various applications in Electronics
PSO2	Understand the concept of different microcontrollers and its implementation
PSO3	Apply the use of microcontrollers in controlling various devices
PSO4	Summarize different communication networks
PSO5	Understand and execute the concepts of digital system design
PSO6	Explain the principles of Soft computing, Internet of things and Robotics
PSO7	Exemplify the basics of Digital Signal Processing and its applications.
PSO8	Summarize various techniques in Statistical Signal Processing
PSO9	Implement various digital signal processing techniques using Matlab

Course Outcomes

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ELS1C01- Applied Mathematics

At the end of this course, a student will have developed ability to:

CO1	Understand numerical methods for solving algebraic and transcendental equations.
CO2	Identify the numerical methods to solve simultaneous algebraic equation
CO3	Illustrate numerical integration and differentiation methods.
CO4	Develop linear programming problems.
CO5	Interpret the basic feasible solution of transportation problems.
CO6	Explain basic probability axioms and its different applications
CO7	Understand the concept of vector space.
CO8	Interpret linear transformations and eigen value problems.

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ELS1C02- Microcontroller Based System Design

At the end of this course, a student will have developed ability to:

CO1	Describe the basics of 8051 microcontroller
CO2	Discuss about memory and I/O interfacing
CO3	Ask about I/O programming
CO4	Discuss about C programming
CO5	Explain timer, interrupts and serial port in 8051 and its implementation
CO6	Illustrate different interfacing using 8051
CO7	Summarize Arduino and its programming.
CO8	Explain about python programming for Raspberry pi

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ELS1C03- Modern Digital And Optical Communication

At the end of this course, a student will have developed ability to:

CO1	Understand concept of Digital Network
CO2	Explain Protocol layers
CO3	Classify LAN hardware and Components
CO4	Explain concept of optical communication.
CO5	Explain BER
CO6	Summarize the nonlinear effects
CO7	Explain WDM system

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ELS1C04- Advanced Digital System Design

At the end of this course, a student will have developed ability to:

CO1	Establish a digital logic and apply it to solve real life problems.
CO2	Design and implement combinational and sequential logic circuits.
CO3	Understand digital system design using PLD.
CO4	Focus different threshold logic functions.
CO5	Explain the FPGA architecture
CO6	Illustrate device technologies, system representation and abstraction levels
CO7	Evaluate various Xilinx series

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ELS1L01- Application Based Programming In Embedded C &Python

At the end of this course, a student will have developed ability to:

| CO1 | Understand the basics of Embedded C and Python Programming |
| CO2 | Apply the use of various interfacing devices using Arduino and Raspberry pi boards |

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ELS2C05- High Performance Communicationnetworks

At the end of this course, a student will have developed ability to:

CO1	Understand concept of basics of networks.
CO2	Memorize OSI and IP models
CO3	Compare different packet switched networks
CO4	Explain internet and TCP/IP network
CO5	Understand network design
CO6	Explain optical network
CO7	Observe WDM System
CO8	Understand switching design

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ELS2C06- Wireless Communication

At the end of this course, a student will have developed ability to:

CO1	Describe about mobile communication techniques and different connecting networks.
CO2	Infer the design fundamentals of cellular systems and technical challenges.
CO3	Understand different propagation models
CO4	Discuss about multiple access techniques
CO5	Describe the principles and applications of modern wireless systems.
CO6	Ask about analog and digital modulation techniques
CO7	Describe about the performance of various modulation techniques
CO8	Describe speech coding and channel coding

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ELS2C07- Design Of Embedded Systems

At the end of this course, a student will have developed ability to:

CO1	Remember ideas about embedded design life cycle
CO2	Understand about hardware trends
CO3	Identify partitioning decision
CO4	Understand toolset and testing methods
CO5	Summarize basic concepts of RTOS
CO6	Compare different commercial RTOS features
CO7	Infer embedded product development life cycle
CO8	Illustrate different case studies of embedded applications

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ELS2C08- Advanced Microcontrollers

At the end of this course, a student will have developed ability to:

CO1	Express the basic features of PIC Microcontrollers
CO2	Understand PIC microcontroller with its registers ,RAM and ROM
CO3	Understand the concepts of PIC programming using Assembly & Embedded C
CO4	Explain the concepts of peripherals in PIC microcontroller
CO5	Interpret different interfacing techniques using PIC microcontroller
CO6	Interpret the basics of ARM microprocessor
CO7	Explain the Registers- Pipeline- Interrupts in ARM microprocessor

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ELS2L02- Embedded Systems Lab

At the end of this course, a student will have developed ability to:

CO1	Understand the basics of Embedded C using keil and MPLAB Software's
CO2	Apply the use of various interfacing devices using PIC microcontroller and ARM microprocessor

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ELS3C09- Soft Computing And Optimization Techniques

At the end of this course, a student will have developed ability to:

CO1	Identify the applications of neural networks
CO2	Understand the principles of neural networks
CO3	Infer the concept of fuzzy logic
CO4	Illustrate neuro-fuzzy modeling
CO5	Interpret different case studies of neuro-fuzzy models
CO6	Understand the concept of optimization techniques
CO7	Understand different conventional optimization techniques
CO8	Understand various evolutionary optimization techniques

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ELS3C10- Advanced Digital Signal Processing

At the end of this course, a student will have developed ability to:

CO1	Comprehend the basics of DSP
CO2	Explain the basics of Matlab Programming
CO3	Summarize the different attributes of discrete random signal processing
CO4	Analyze the estimation techniques to calculate power spectrum
CO5	Explain the basics of multi rate digital signal processing

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ELS3C11- Internet of Things

At the end of this course, a student will have developed ability to:

CO1	Interpret the vision and levels of IoT
CO2	Explain IoT architecture and protocols
CO3	Implement data and knowledge management using different IoT protocols
CO4	Explain the security system with IoT
CO5	Develop the IoT with Raspberry Pi
CO6	Develop the IoT with Aurduino
CO7	Determine the revolution of internet in web services, cloud and sensor network.
CO8	Understand the web services for IoT

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ELS3E01A- Risc Processor Architecture & Programming

At the end of this course, a student will have developed ability to:

CO1	Understand AVR architecture
CO2	Practise programming with AVR
CO3	Understand ARM architecture and its instruction sets
CO4	Identify the concept of ARM application development
CO5	Illustrate the use of memory protection and management in RISC machine
CO6	Interpret programming practices in ARM using ASM/C

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ELS3E01B - Industrial Instrumentation & Automation

At the end of this course, a student will have developed ability to:

CO1	Illustrate PC architecture and its interfacing with its peripherals
CO2	Understand the use of sensors in industrial measurements
CO3	Illustrate different PC based data acquisition modules in industrial measurements
CO4	Familiarize different PC based data acquisition & control system
CO5	Identify various components of intelligent instrumentation
CO6	Identify the applications of Programmable logic Controllers

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ELS3E01C- Vlsi Design And Vhdl Programming

At the end of this course, a student will have developed ability to:

CO1	Discuss sequential and combinational circuit design using HDL.
CO2	Illustrate MOS transistor theory.
CO3	Understand CMOS technology and its design rules.
CO4	Describe the basics of HDL programming
CO5	Explain combinational circuit design using verilog
CO6	Explain sequential circuit design using verilog

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ELS3E01D - Satellite Communication

At the end of this course, a student will have developed ability to:

CO1	Understand the basics of orbital parameters in satellite communication
CO2	Explain link calculation in satellite communication
CO3	Determine various access techniques used in satellite communication
CO4	Identify Earth station, high power transmitters and antennas used in satellite communication
CO5	Classify the satellites and discuss its use
CO6	Understand the design of earth station design of satellites
CO7	Understand how analog & digital technologies used for satellite communication networks

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ELS3L03- Communication And DSP Lab

At the end of this course, a student will have developed ability to:

CO1	Familiarization of MATLAB.
CO2	Implement MATLAB based programs.
CO3	Apply linear and circular convolution
CO4	Evaluate DTFT, DFT
CO5	Design of filters using MATLAB
CO6	Construct AM and FM modulation and Demodulation techniques using Simulink
CO7	Compute PAM, BFSK, MSK
CO8	Familiarization of optical fiber and optical communication

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ELS4C12- ROBOTICS

At the end of this course, a student will have developed ability to:

CO1	Understand the concept of Coordinate transformation.
CO2	Understand the principles of robot kinematics, dynamics and Trajectory planning.
CO3	Identify robot hardware and its organization.
CO4	Illustrate the principles and applications of AI in robotics.
CO5	Practice programming principles and languages for a robot control system.
CO6	Identify the key principles of Robotic Vision Systems
CO7	Understand various applications of industrial robotic systems.
CO8	Compare different types of robot configurations and their role in automation

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ELS4E02A - Cryptography And Network Security

At the end of this course, a student will have developed ability to:

CO1	Understand the basics of Cryptography
CO2	Understand different encryption techniques
CO3	Summarize public key cryptosystems
CO4	Understand about message authentication and security
CO5	Determine about e-mail security
CO6	Understand about IP security and associated problems

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ELS4E02B- Digital Image Processing

At the end of this course, a student will have developed ability to:

CO1	Distinguish fundamentals of image processing
CO2	Compare different image transforming methods
CO3	Infer image enhancement techniques in image processing
CO4	Infer restoration methods in image processing
CO5	Understand image segmentation techniques
CO6	Understand image enhancement techniques

ELS4E02B- Digital Image Processing

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ELS4E02C - Design Of Smart Systems

At the end of this course, a student will have developed ability to:

CO1	Understand the overview of smart system designs.
CO2	Understand different design requirements of embedded systems
CO3	Compare different applications of embedded systems
CO4	Understand the concept of home automation
CO5	Discuss the smart appliances and energy management
CO6	Summarize about embedded systems and robotics

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ELS4E02D - Verilog Programming

At the end of this course, a student will have developed ability to:

CO1	Understand basic CMOS circuits and its characteristics
CO2	Understand the fundamentals of Verilog programming
CO3	Understand the programming using verilog to implement basic combinational circuits
CO4	Explain different sequential circuits designs
CO5	Explain CMOS technology
CO6	Explain various design and implementations of basic circuits using Verilog

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ELS4E03A - Mems And Nems

At the end of this course, a student will have developed ability to:

CO1	Identify micro, nano scale systems and their applications
CO2	Identify MEMS fabrication technologies
CO3	Interpret the working of various micro sensors.
CO4	Interpret the basic approaches for designing various actuators.
CO5	Understand the principles of Nano systems
CO6	Identify the uses of Quantum mechanics

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ELS4E03B- Wireless Adhoc And Sensor Networks

At the end of this course, a student will have developed ability to:

CO1	Understand various MAC protocols developed for Ad Hoc networks.
CO2	Identify different TCP protocols developed for Ad Hoc networks.
CO3	Understand routing protocols for Ad Hoc wireless networks.
CO4	Illustrate the concepts of network architecture and MAC layer protocol for Wireless Sensor Networks.
CO5	Identify different protocols and issues in Sensor management
CO6	Identify and address the security threats in Ad Hoc and sensor networks.

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ELS4E03C - Neural Networks & Applications

At the end of this course, a student will have developed ability to:

CO1	Understand the fundamentals of artificial neural networks.
CO2	Illustrate neural network using back propagation algorithm and its applications.
CO3	Understand the fundamentals of Bi-directional Associative memory.
CO4	Illustrate the principles of Simulated Annealing and Counter Propagation Network
CO5	Illustrate Self organization map and Adaptive Resonance Theory
CO6	Understand the Architecture of Neocognitron

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ELS4E03D - MICROWAVE ELECTRONICS

At the end of this course, a student will have developed ability to:

CO1	Understand the principles of microwave communication
CO2	Analyse the working of various microwave components and their parameters
CO3	Interpret different Microwave transmission lines
CO4	Understand the principles of RF components
CO5	Illustrate the working of RF Microwave Antennas
CO6	Understand the testing of microwave components and circuits with standard microwave bench and vector network analyzer