ISTAR

M. SC. INSTRUMENTATION & CONTROL

COURSE OBJECTIVE AND OUTCOME

FIRST SEMESTER

101390101: TRANSDUCERS **Faculty:** **Mr. Krunal Suthar**	**Description:** To introduce different types of transducers and its operational principles as it is the base for any further signal processing and applications. **Outcome**: Students will be able to know how basic signal is acquired with different transducers having different sensing mechanism and circuit design.
101390102: MICROPROCESSOR & MICROCONTROLLER SYSTEMS **Faculty:** **Mr. Sameep Dave**	**Description:** To introduce 8-bit microprocessor, microcontrollers and embedded systems with its interfacing circuits and assembly language programming. **Outcome**: Students will understand hardware architecture of 8085 microprocessor, 8051 microcontroller and its programming for interfacing.
101390103: PRINCIPLES OF CONTROL SYSTEMS **Faculty:** **Dr. Himanshu Kapse**	**Description:** This course introduces students to theory and applications of different control systems and modelling methods. **Outcome**: Students will be able to learn the role of feedback system in control mechanism and various methods to analyse in Laplace, time and frequency domain modes.
101390107: INSTRUMENTATION OF PROCESSING CIRCUITS **Faculty:** **Mr. Sameep Dave**	**Description:** This course consists of important applications of Op-amps including filter circuits. **Outcome**: This will enable the student to learn Op-amp circuits with wide applications in all fields.
101390108: NETWORK ANALYSIS **Faculty: (Visiting)** **Mr. Bhavesh Hindocha**	**Description:** This course is to impart useful skills to students to enhance their fundamental knowledge and circuit analysis capability. **Outcome**: Students will learn different methods involve in analysis of linear and non linear circuits. Also provides basic information about network parameters use for analysis.
101390109: OPTOELECTRONICS **Faculty:** **Mr. Sameep Dave**	**Description:** This course is specifically designed for optical devices and science of light propagation through optical fibres. **Outcome**: Students will be able to learn working principles of LASER and LED and its applications in various fields through light propagation in optical fibres.

SECOND SEMESTER

101390201: ANALYTICAL INSTRUMENTATION **Faculty:** **Dr. Himanshu Kapse**	**Description:** The course covers theory operation and working principles of different analytical instruments used for various applications **Outcome**: This course has wide applicability in the market. Different instruments operation and working concept understanding is the outcome.

101390202: ADVANCED MICROPROCESSOR & MICROCONTROLLERS
Faculty:
Mr. Sameep Dave

Description: The course is to provide overview of 16-bit microprocessor and basic concepts of Atmega328 controller.

Outcome: This provides understanding 16-bit architecture, programming, interfacing and basic concepts of Arduino platform.

101390203: COMPUTER AIDED PROCESS CONTROL
Faculty:
Dr. Dhananjay Dhruv

Description: This course is to introduce various process dynamics, variables and models to control system using computers. Also real time control concepts and designing aspects are included.

Outcome: At the completion student will learn the control with the aid of computer and its designing aspects with different modelling techniques.

101390207: POWER ELECTRONICS
Faculty:
Mr. Krunal Suthar

Description: This course consists of theory, working principles of various power semiconductor devices and their switching characteristics.

Outcome: Students will learn about power electronics their switching characteristics in industrial applications including motors and drives.

101390208 : BOILER INSTRUMENTATION
Faculty: (Visiting)
Mr. Bhavesh Hindocha

Description: This course consists of Boiler mechanism and control process its types and application. Also concept of different power plants is included.

Outcome: This will enable student to understand operational mechanisms of different types of Boilers and different power plants concept.

101390209 : METEOROLOGICAL INSTRUMENTATION
Faculty: (Visiting)
Dr. Dhananjay Dhruv

Description: This course consists of Meteorological transducers and its types and application. Also concept of Radar and its applications is included.

Outcome: This will enable student to understand operational mechanisms of different types of Meteorological instruments and radar principles for different applications.

THIRD SEMESTER

101390301: BIOMEDICAL INSTRUMENTATION
Faculty:
Dr. Himanshu Kapse

Description: The focus is to provide theory and operating principles of Biomedical measuring and monitoring instruments.

Outcome: Student will gain knowledge of various measuring and monitoring instruments used in Hospitals. Also learn safety measures to handle instruments.

101390302: INDUSTRIAL COMMUNICATION TECHNIQUES
Faculty:
Dr. Himanshu Kapse

Description: This course is for the concepts of hardware and software used in different communication system. Also includes Industrial standard communication protocols.

Outcome: Students will be aware about and implement the different protocols for communications meant for data transmission as well as industrial applications to control different operations.

101390303: PLC – DCS - SCADA
Faculty:
Mr. Bhavesh Hindocha

Description: This course is to impart knowledge about Programmable logic controller , distributed control systems and supervisory systems concepts.

Outcome: Student will thoroughly learn PLC programming its application, DCS utilization and SCADA implantation in plants.

101390307: SATCOM INSTRUMENTATION
Faculty: Mr. Sameep Dave

Description: This course provides the basics of Microwave techniques and Satellite communication systems.

Outcome: On completion student will gain know how about the up link and down link of microwave signals and functions of transponders. Also learn calculations of signal attenuation and orbital dynamics.

101390308: DIGITAL SIGNAL PROCESSING
Faculty: (Visiting) Ms. Heena Kher

Description: This course is to provide concepts on design, processing signal algorithm and implementation for applications.

Outcome: It will help to learn signals and system, different mathematical algorithm and its importance for different circuit design and applications.

101390309: CNC Machine and Programming Concept
Faculty: (Visiting) Dr. Ajay Patel

Description: This course is to provide concepts of CNC machine and design and programming concepts and its implementation for applications.

Outcome: It will help to learn CNC programming concept for various applications and its design and implementation in different fields.

FOURTH SEMESTER

101390401 : MEDICAL IMAGING SYSTEMS & THERAPEUTIC EQUIPMENTS
Faculty: Dr. Himanshu Kapse

Description: This course provide medical imaging concepts of different instruments used for diagnostic purpose. It also includes therapeutic equipment principles and implementation.

Outcome: Learning of different imaging instrument like X-ray, MRI, Ultrasound etc. With its utility. Also learning of operating principles of therapeutic equipments for treatment purpose.

101390402: FABRICATION & CHARACTERIZATION TECHNIQUES
Faculty: Dr. Himanshu Kapse

Description: This course consists of theory and operating principles of different IC and film fabrication techniques and vacuum systems used for it. The characterization methods involved.

Outcome: Students will get knowledge of fabrication techniques and instruments used for it. Analysis of fabricated devices with different methods and learn how to characterize the fabricated device.

101390403 : ROBOTICS AND FUZZY LOGIC
Faculty: (Visiting) Mr. Sameep Dave

Description: The course has insight of Robotics concepts mechanism and application. Also Fuzzy logic provides other logical method to control systems.

Outcome: Student will learn different types of Robots, its algorithms and functionalities. Fuzzy logic will give alternate control mode through its fuzziness.

101390407 : PROGRAMMING IN C
Faculty: Mr. Krunal Suthar

Description: Introductory subject to high level procedural programming using C with examples.

Outcome: At the completion of this course student will learn design and development of program for solving problems. Also will enable them to understand programming concepts and interfacing hardware.

101390408 : ARTIFICIAL INTELLIGENCE & NEURAL NETWORKS
Faculty: (Visiting) Dr. Parag Moteria

Description: This course is for designing concepts through artificial intelligence and neural networks.

Outcome: Student will learn modelling and simulation of systems. Also learn pattern recognition. Learning of decision making through different models in neural networks.

101390409 :
Nanoelectronics
Faculty:
Dr. Dhananjay Dhruv

Description: This course is based on advanced technology and its concept of nano science. Semiconductor quantum structures and carbon nano tubes are included.

Outcome: On completion of basic idea about nano science and electronics will be cleared. Aspects of carbon nano tubes and Graphene in nano tubes will be understood.