

B.Voc. INDUSTRIAL INSTRUMENTATION AND AUTOMATION

Programme Outcome

PO 1 : Graduates will be equipped with the necessary knowledge, technical, creative and managerial skills in instrumentation and automation field.

PO 2 : Graduates will be able to communicate effectively with the Industrial hierarchy.

PO 3 : Graduates will have knowledge about health, safety and legal issues in industry

PO 4 : Graduates will be able to undertake responsibility either as an individual or as a team member.

PO 5 : After completing diploma Students will be able to work as a technician in Instrumentation and Electronic Automation Industry.

PO 6 : Advanced diploma and Diploma certificates holders are eligible to work as Supervisor and Manager level in the respective fields

Programme Specific Outcome

PSO 1 : Students will acquire communication, soft skill, social awareness and entrepreneurship skill.

PSO 2 : Students will acquire technical skill for developing embedded based industrial automation and Electronic circuit development.

PSO 3 : Can develop strong technical knowledge for establishing instrumentation-based automation system in various industries.

PSO 4 : Students can acquire job as soldering, calibration, Instruments, Piping, PLC, Virtual Instruments and embedded technician / Supervisor / Manager / Engineer.

Course Outcome

FIRST SEMESTER		
COURSE CODE	COURSE TITLE	COURSE OUTCOME
GP101	LISTENING AND SPEAKING SKILLS IN ENGLISH	Introducing the science of English language to students in order to make them familiarize with the global intelligibility of English. Effective communication in English to make them confident for different situations. Refinement of reading efficiencies and strategies.
GP102	IT FOR BUSINESS	To impart basic computer Knowledge skills this is necessary to work in the up to date industry. The program ensures the students capability in working with the computer for running any business units.

GPM103	DISCRETE MATHEMATICS I	This course will enable the students to develop the logical skills, problem-solving skills and introduce the basic concepts of number theory. Students will enable students to identify the real-life applications of mathematics.
IAS104	BASICS OF ELECTRONICS AND ELECTRICAL TECHNOLOGY	The course will enable students to provide the fundamental knowledge in electronics to enable understanding of its applications. Students will be able to recognize the component and type of component, material used, construction and the working principle of the component, Test the component, hands-on opportunities to construct electronic circuits and build electronic projects of varying difficulty levels, Practice soldering and de-soldering of various types of electrical and electronic components
IAS105	BASIC INSTRUMENTATION	Students will learn the basics of instrumentation and measurements classification of instruments, generalized measurement system, learn about the errors in measurements, familiarize with the tools used in the industry, familiarise with electrical analog, digital instruments.
IAS106	PROJECT - DOMESTIC CIRCUITS	Students will complete domestic electronic instrumentation circuit project within the given time period, and they should keep all the important paper works (abstract, design, working principle, data sheet data collection etc.) along with them.
SECOND SEMESTER		
GP201	WRITING AND PRESENTATION SKILLS IN ENGLISH	This course aims to disappear their presentation phobia and improves their writing skill without grammatical errors
GPM202	DISCRETE MATHEMATICS II	The course will enable students to logically analyse and critically evaluate problem situation through graphical methods. Students will aware about the basic concepts of Boolean algebra and to develop analytic, logical and critical thinking skills.
IAG203	ELECTRONIC CIRCUITS AND COMMUNICATION SYSTEMS	Students will able Design and construct BJTs and MOSFET amplifiers, understand the advantages and method

		of analysis of feedback amplifiers, understand the analysis and design of LC and RC oscillators, amplifiers, multivibrators, and time base generators.
IAS204	ANALOG AND DIGITAL ELECTRONICS	Students will be able to design and construct various types of analog and digital circuits using ICs. Students will be able to design complex digital systems and to maintain such circuits and in turn maintain equipment having such circuits.
IAS205	SENSORS AND TRANSDUCERS	Students will be able to analyse and troubleshoot different types of transducers, sensors with respect to the process variables, commonly used instruments for each process variables.
IAS206	INTERNSHIP – I	students will get industry experience and will be able to prepare comprehensive report. Student will get a certificate of internship from the organization.
THIRD SEMESTER		
GP301	PRINCIPLES OF MANAGEMENT	This course is a basic introductory and foundational management course. It is designed for students who desire to equip themselves with key knowledge, skills, and competencies in various aspects of management. The course encompasses the core components of management including planning, organizing, leading and controlling the organizations.
IAG302	INDUSTRIAL INSTRUMENTS	Students will be able to understand the instruments and their different classifications with respect to the process variables, and commonly used instruments for each process variable.
IAG303	CIRCUIT SIMULATION AND PCB DESIGNING	Students will be able to design PCB using software. PCB (Printed Circuit Board) designing is an integral part of each electronics products and this program is designed to make students capable to design their own projects PCB up to industrial grade.
IAS304	MEDICAL INSTRUMENTATION	Students will enable to identify troubles of different instruments/equipment used in the health care industry. To understand the physical foundations of

		biological systems, various electrodes and detailed understanding about the various electro physiological measurements in the human body.
IAS305	INTRODUCTION TO MICROPROCESSORS AND CONTROLLERS	This course is to expose to the students to the architecture and instruction set of typical 8-bit microprocessor and 16-bit microprocessor. It also deals with Assembly Language Programming using a macro-assembler. This course also provides an introduction to microcontrollers and interfacing. Architecture operation and applications of microcontrollers, including system level organization, analysis of specific processors, and software and hardware interface design. To introduce the basic concepts of embedded c.
IAS306	PROJECT – INSTRUMENTATION	students will be able to design a complete electronic instrumentation circuit. Students will go through various production stages under the guidance and approval of the supervising faculty/faculties. Students will complete the project within the given time period, and they should keep all the important paper works (abstract, design, working principle, data sheet data collection etc.) along with them.
FOURTH SEMESTER		
GP401	SOFT SKILL AND PERSONALITY DEVELOPMENT	The course aims to cause a basic awareness about the significance of soft skills in professional and inter-personal communications and facilitate an all-round development of personality.
IAG402	VALVES AND ACTUATORS	Students will be able to identify and troubleshoot control valve by learning about different parts of the control valve, by studying different types of valves and its maintenance and assembly. By studying about actuators and their types and its maintenance and working.
IAG403	EMBEDDED AUTOMATION	This will enable students to design and interface microcontroller-based embedded systems. High-level languages are used to interface the microcontrollers to various applications. There are extensive hands-on

		labs/projects. Embedded system for sensor applications will be introduced.
IAS404	VIRTUAL INSTRUMENTATION	Students will learn acquisition methodologies, Compare traditional and virtual instrumentation, operating systems required for virtual instrumentation, general structure of SCADA system, functional elements, data links, software and algorithms, communication and control aspects of modern plant automation system.
IAS405	OPTICAL INSTRUMENTATION	Students will learn basics of optics and fiber optic technology. Students will be able to develop various technological and application level fiber optic network including the recent and emerging technologies in fiber optics. Each topic will be developed in logical progression with up-to-date information.
IAS406	INTERNSHIP – II	students will get industry experience and will be able to prepare comprehensive report. Student will get a certificate of internship from the organization.
FIFTH SEMESTER		
GP501	ENVIRONMENTAL STUDIES & HUMAN RIGHTS	This course provides an overview of the equity and justice dimensions of climate change from the perspectives of environmental justice and human environmental rights. Although many aspects of climate change have attracted considerable scholarly, policy, and public attention, climate justice and equity have received far less consideration. The course begins with an introduction to environmental justice, human rights and the environment, and vulnerability and adaptation to climate change. The course provides an introduction to basic human rights philosophy, principles, instruments and institutions
IAG502	INDUSTRIAL DATA COMMUNICATION AND NETWORKING	Students will be able to test, build, wire and troubleshoot the different types of industrial data communication circuits used for instrumentation like FieldBUS, ProfiBUS network for automation. This this course is very important for instrumentation engineers who want to

		work in industrial automation sector.
IIAG503	INDUSTRIAL SAFETY & MANAGEMENT	Students will be aware about safety awareness, the fundamentals of science and engineering of safety. The students will acquire attitude towards safety.
IIAS504	ROBOTIC AUTOMATION	Students will learn the direct and inverse kinematics motion and control path planning techniques dynamics and control of manipulators Students will be able to program Robotic system using the Arduino Micro-controller and controlling robots using Arduino.
IIAS505	CONTROL THEORY AND PROCESS CONTROL INSTRUMENTATION	Students will aware about the fundamental concepts, principles and application of control theory and controller design to the undergraduate students. Instrumentation part will consist of valve characteristics, various measuring devices, instrumentation symbols, introduction to P&ID and complex systems.
IIAS506	PROJECT III – INSTRUMENTATION AND AUTOMATION	students will be able to complete an automated embedded instrumentation Plant. Students will be able to complete the project within the given time period, and they should keep all the important paper works (abstract, design, working principle, data sheet data collection etc.) along with them.
SIXTH SEMESTER		
IIAG601	ENTREPRENEURSHIP DEVELOPMENT	Students will learn concept and overview of entrepreneurship with a view to enhance entrepreneurial talent. To impart knowledge on the basics of entrepreneurial skills and competencies to provide the participants with necessary inputs for creation of new ventures. To explore new vistas of entrepreneurship in 21st century environment to generate innovative business ideas.
IIAG602	DISTRIBUTIED CONTROL SYSTEM	This course will enable the students to develop the skills to draw and interpret requisite process instrumentation loop diagrams using knowledge of relevant symbols and Standard conventions and to document records properly
IIAG603	PIPING AND INSTRUMENTATION	This course enables students with the basic skills they will need to prepare a

	DIAGRAMS	wide range of Instrument drawings. It presents a step-by-step approach to the basic fundamental's students will need to begin a successful career in industrial instrumentation and design. This course also provides training for sketching the different graphical symbols for piping and joints.
IAS604	ADVANCED EMBEDDED AUTOMATION	This course will enable the students to understand any other processor architectures at ease. Students will be able for integration and control of analog and digital electronics to sophisticated single board computers and microcontrollers
IAS605	PROCESS CONTROL INSTRUMENTATION	Students will be able to: compare conventional sequential control with programmable logic control system, develop programs using different PLC programming languages for sequential and continuous process interface analog and digital input/ output devices with PLC using different communication protocol, test the PLC based system and troubleshoot the errors associated with it.
IAS606	INTERNSHIP – III	After the completion of the Sixth semester, students will be able to understand various aspects in a design production atmosphere.