SDG 9: INDUSTRY, INNOVATION AND INFRASTRUCTURE

SDG 9 focuses on innovation, industry, and infrastructure. Integrating this SDG strengthens technological development and research skills. Students explore sustainable industrial practices. This supports resilient infrastructure growth.



List of Courses mapped to SDG 9:

S.No	Course Title	Name of the Program	Justification for SDG Mapping
1	IIOE 4.0 FOR AUTOMATION AND ROBOTIC SYSTEMS	M.Tech. (Robotics & Automation)	Covers Industry 4.0 technologies, automation and robotics that modernise industrial systems.
2	TRANSPORT PROCESS IN BIOLOGICAL SYSTEMS	B.Tech. - Biotechnology	Builds process-engineering fundamentals used to design bioprocess industries.
3	FERMENTATION TECHNOLOGY	B.Tech. - Biotechnology	Covers industrial-scale fermentation used in pharmaceuticals, food and biofuel production.
4	MODERN MANUFACTURING PROCESSES	B.Tech. - Mechanical Engineering	Teaches advanced manufacturing methods that drive industrial innovation and efficiency.
5	INDUSTRIAL IOT GATEWAY APPLICATION DEVELOPMENT	B.Tech. - Electrical and Electronics Engineering	Develops IoT gateway applications that connect industrial equipment and data systems.
6	INDUSTRIAL INTERNET OF THINGS	B.Tech. - Internet of Things	Covers connected sensors and analytics that make industry and infrastructure smarter.
7	MICROBIAL TECHNOLOGY	B.Tech. - Biotechnology	Applies microbes to industrial products and processes, fostering bio-based innovation.
8	INDUSTRIAL PHARMACY - I & II	B.Pharmacy	Covers pharmaceutical manufacturing, scale-up and industrial practice.
9	INSIGHTS TO SUSTAINABLE DEVELOPMENT GOALS	All B.Tech Programs	Module 3 covers Industry, Innovation and Infrastructure, and Module 6 covers technology, frugal innovation and digital public infrastructure as SDG accelerators.

Course Outcomes and Syllabus

IIoE 4.0 for Automation and Robotic Systems

SDG 9

Course code: 25RA5102 | L-T-P-S: 3-0-2-0 | Credits: 4 | Programme: M.Tech. (Robotics & Automation)

CO	Course Outcome	PO / PSO	BTL
CO1	Describe IOT,IIOT	PO1, PO2	2
CO2	Apply the concepts learnt to Robotic industry IoT Devices and IndustrialData Acquisition	PO2, PO3	2
CO3	Apply the Cognitive Sensors and IoT4.0 and design studies on machineto machine based IOT	PO2, PO3	3
CO4	Apply mathematical Modeling and Design for IIOT, able to analyze andsolve the design issues on Siemens based Melds Mendix IOT Devices	PO3, PO4	3
CO5	Analyze the functioning of IIoT devices, sensors, actuators, and communication protocols to evaluate their role and integration in automation and robotic systems	PO3, PO4	4

Syllabus

CO-1: Overview of Robotic and automation Industrial IoT (IIoT) 4.0: Industry 4.0 and 5.0 Basic terms –Ecosystem IOT and IIOT -History of IIOT 4.0-Components of IIOT-Robotics Industry IoT 5.0 sensing and processsystems -Business Models and Reference Architecture of IIoT-Challenges & Benefits in implementing IIOT 4.0-Business Models and Reference Architecture of IIoT -Service Level Agreement of IIOT 4.0-Characteristics of roboticsand automation industry 4.0 IOT.

CO-2: Robotic Industry IOT Devices: IIOT based Sensors and Actuators, Categories,Functionality, and characteristics- Industrial Data Transmission: Foundation Fieldbus, profibus, HART, Interbus,Bitbus, DigitalSTROM, CAN, DeviceNet, LoRaandLoRaWAN. Industrial Data Acquisition:Distributed ControlSystem-PLC-SCADA –Factory IIoT Analytics:Sentinel forIndustrial Robots IoT 5.0-Categorization of analytics: IIoTand Industry 4.0 context-Mapping of analytics with the IIRA architecture-Discovering OPC

CO-3: Cognitive Sensorsand IoT4.0: Introduction to Cognition in IoT- Information-Centric Sensor Networks-for Cognitive IoT-Cognitive-NodeArchitecture and aDeployment Strategy for the Future Sensor Networks- A Data Delivery Framework forCognitiveInformation-Centric Sensor Networks in Smart Outdoor Monitoring- Cognitive Routing Protocol for Disaster-InspiredWSNs on the Internetof Things- Fog-Based Caching and Learningfor Information- Centric Networks-M2M To IOT -M2M Vs IOT – A vision from M2M to IOT – Case Study

CO-4: Collaborative Man and Machine Workforce (IIoT 4.0):Technological Architecture Collaborative Robots in Industry 5.0- Robotics Modeling and Design: Mathematical Modelof a Swarm Robotic- System with Wireless Bi-directional-Energy Transfer -Machine Learning and Deep Learning inIndustries IOT 5.0-Pareto Optimal Solutions and Their-Application in Designing Robots-and Robotic Systems.Collaborative Robotics IOT 5.0: Control and Ergonomic Problems of Collaborative Robotics-Human-Robot InteractionEfficiency and Human-Robot Collaboration -Human-Robot Cooperation in Technological Wall Climbing Robot-Features of Human-ExoskeletonInteraction System-Analysis of Dynamics in Human Exoskeleton CollaborativeSystem-Design studies on Siemens Melds Mendix with MindSphere to Boost IIoT Development.

Transport Process in Biological Systems

SDG 9

Course code: 22ES2102 | L-T-P-S: 3-0-2-0 | Credits: 4 | Programme: B.Tech. - Biotechnology

CO	Course Outcome	PO / PSO	BTL
CO1	Understand and apply principles of momentum transfer in biological systems	PO1,PO2	3
CO2	Understand and apply principles of Heat Transfer in Biological systems	PO1,PO2	3
CO3	Understand and apply principles of Mass Transfer in Biological systems	PO1,PO2	3
CO4	Apply separation and purification unit operations in biological products	PO1,PO2	3
CO5	Apply unit operations of momentum, heat and mass transfer in bioprocessing.	PO1,PO2	3

Syllabus

Introduction to Transport Phenomena – momentum, heat and mass transfer in bioprocessing, Analogy between mass, heat and momentum transfer. Momentum Transfer –Conservation of Mass, Conservation of Energy, Momentum Balance– Momentum Balance in a Circular Pipe, Flow Velocity Profile, Reynolds Experiment, Bernoulli's theorem, Fermentation Broth Rheology – Viscosity, Rheological Properties of Fermentation Broths, Factors affecting broth viscosity, Hydrodynamic methods- orifice and venturimeter, Rota meters. Heat Transfer – Various Modes of heat transfer, viz., conduction convection and radiation. Calculation of Heat-Transfer Coefficients. Application of heat transfer in Bio processing. Heat Management in Bioreactors, Relationship between heat transfers, cell concentration and stirring conditions, Heat exchangers. Mass Transfer – Diffusivity, theory of diffusion, role of diffusion in bioprocessing. Definition of binary mass transfer coefficients. Convective mass transfer – Liquid-solid, liquid-liquid, gas-liquid mass transfers, Oxygen transport to microbial cultures – Gas liquid mass transfer fundamentals. Oxygen requirement of microbial cultures. Oxygen transfer by aeration and agitation. Determination of oxygen mass transfer coefficient by various methods. Unit operations in Bioprocessing : Evaporation of Biological materials- Introduction and properties; Adsorption – Types, nature of adsorbents, adsorption isotherms; Extraction- Liquid equilibria; Bioleaching; leaching- Preparation of the solid, rates of leaching, single stage leaching-In soluble liquids Drying- Drying equilibria, terms, mechanisms; Crystallization- crystal geometry, rate of nucleation, crystal growth.

Fermentation Technology

SDG 9

Course code: 22BT3112 | L-T-P-S: 3-0-2-0 | Credits: 4 | Programme: B.Tech. - Biotechnology

CO	Course Outcome	PO / PSO	BTL
CO1	Acquire the knowledge of fermentation process basics	PO1,PO5	1
CO2	Understand the knowledge of medium optimization	PO1,PO5	2
CO3	Acquire the knowledge of medium sterilization.	PO1,PO5	1
CO4	Understand the principles of aeration and agitation	PO1,PO5	2
CO5	Demonstrate fermentation processes to produce value added proteins and other biological substances for human, animal therapeutic use, food production processing and bio fuels.	PO1,PO5	4

Syllabus

Introduction to Fermentation Process- Different range of fermentation processes; Chronological development of fermentation industry; General requirements of fermentation processes; an overview of aerobic and anaerobic fermentation process, Design of reactor with respect to aspect ratios; Ancillary fittings for reactors (sampling port); Aseptic transfer of spore suspension. Medium Requirements and Optimization- Medium requirements for fermentation processes, Carbon, Nitrogen, Minerals, Vitamins and Other Complex nutrients, Oxygen requirement. Introduction to medium optimization; Methods of media optimization (One factor method and Plackett- Burman design). Fermentation Process & Sterilization Techniques-Classification of fermentation system (Batch, fed-batch, Continuous); Dual and multiple fermentations; Concept of Chemostat; Turbidstat; Monitoring and control of fermentation process. Kinds of sterilization techniques; Thermal death kinetics of microorganisms, Batch and Continuous sterilization of liquid media, Filter sterilization, Design of sterilization equipment. Aeration and Agitation In Fermentor-Types of mixing mechanisms (bubble aeration & mechanical); mixing equipment; Types of spargers and impellers in fermentors; Significance of oxygen transfer in fermentations; Factors affecting oxygen transfer rates; importance of Kla in fermentors; Estimation methods of Kla (Sodium sulphite oxidation technique; Dynamic gassing out method; static method; oxygen balance method).Scale Up And Rheology In Fermentations-Scale up of fermentation process; Principles; Theoretical considerations and techniques used; Scale down methods; The Rheology of fermentation broths; Rheological models; Measurement of rheological parameters

Modern Manufacturing Processes

SDG 9

Course code: 22ME4061 | L-T-P-S: 2-0-2-0 | Credits: 3 | Programme: B.Tech. - Mechanical Engineering

CO	Course Outcome	PO / PSO	BTL
CO1	understand the working principle and the effect of various process parameters of mechanical energy-based machining processes	PO2	2
CO2	understand the working principle and the effect of various process parameters of chemical and thermoelectric energy-based machining processes	PO2	2
CO3	understand the working principle and the effect of various process parameters on the performance of various Non-Traditional Welding Processes.	PO2	2
CO4	understand the working principle of various Non-Traditional Forming Processes.	PO2	2
CO5	Perform various non traditional manufacturing for product making	PO5	4

Syllabus

Modern Manufacturing Processes: Introduction, Need for modern manufacturing processes. Classification of modern machining processes based on sources of energy. Mechanical energy-based machining processes: Principle, Equipment, Process parameters, Advantages, limitations and applications of Abrasive jet machining, water jet machining, ultrasonic machining. Chemical energy- based machining processes: Principle, Equipment, Process parameters, Advantages, limitations and applications of Chemical machining, Electro-chemical machining, Electro-chemical deburring and Electro chemical honing. Thermoelectric energy-based machining processes: Principle, Equipment, Process parameters, Advantages, limitations and applications of Electric discharge machining, Wire- electric discharge machining, electric discharge grinding, laser beam machining, plasma arc machining, electron beam machining. Non-traditional welding processes: Principle, Equipment, Process parameters, Advantages, limitations and applications of Laser beam welding, Plasma arc welding, Electron beam welding, Ultrasonic welding, Friction welding, Explosive welding and Under water welding. Non-traditional Forming processes: Methods, advantages, limitations and applications of Explosion Forming Process, Electro Hydraulic Forming, Magnetic Pulse Forming, Petro-Forge Hammer.

Industrial Internet of Things

SDG 9

Course code: 22IOT3101P | L-T-P-S: 3-0-4-4 | Credits: 6 | Programme: B.Tech. - Internet of Things

CO	Course Outcome	PO / PSO	BTL
CO1	To Analyze Industry 4.0 concepts and develop innovative solutions for emerging industrial challenges.	PO3, PO5, PSO1, PO2	4
CO2	Analyze the proficiency of key protocols including HART, BACnet, AMQP, OPC-UA in the field of IIoT	PO2, PO3, PO6, PSO1	4
CO3	Apply process control systems including DAQ, PLC programming	PO2, PO3, PO5, PSO1	3
CO4	Apply the principles of SCADA and PLCs in industrial process control with a case study on predictive maintenance.	PO2, PSO1, PO5, PO3	3
CO5	Apply improvements and optimizations for health monitoring, IoT smart city, smart irrigation, and robot surveillance systems.	PO2, PO3, PO5, PSO1	3
CO6	Analyze and interpret data from Industrial IoT sensors and devices to optimize process efficiency and maintenance strategies.	PO5, PO8	4
CO7	Evaluate and optimize IIoT applications utilizing key technologies to enhance industrial automation and connectivity	PO5, PO6, PO8	5

Syllabus

Industry 4.0: The Fourth Revolution, Overview, IIoT Architecture Process Instrumentation and Automation Field devices, LEAN Production Systems, Smart and Connected Business Perspective, Smart Factories Introduction to Industrial communication protocols and standards - DNP3, DDS, Modbus RTU and TCP/IP, OPC-UA, Fieldbus, Profibus and PROFINET, HART Protocol - Field Device Integration, Device Description Language (DDL), Bac-Net - Objects and Services, BACnet over IP, OPC-UA - Wireless Protocols - ZigBee, Wireless-HART, Data Acquisition and Processing - the importance of SCADA, PLCs in process control and industrial automation. SCADA system architecture (client-server, distributed), SCADA software components (HMI, historian, database), SCADA tags and data acquisition, Real-time and historical data visualization, Industrial IoT- Application Domains: Healthcare, Power Plants, Inventory Management & Quality Control, Plant Safety and Security (Including AR and VR safety applications), Facility Management, Oil Industries.

Microbial Technology

SDG 9

Course code: 22BT3061 | L-T-P-S: 3-0-0-0 | Credits: 3 | Programme: B.Tech. - Biotechnology

CO	Course Outcome	PO / PSO	BTL
CO 1	Acquire the knowledge of microbial technology	PO1	1
CO 2	Screen out medium and strain development	PO5	2
CO 3	Develop various strategies to produce Primary and secondary Metabolites	PO11	3
CO 4	Design various strategies to produce Enzymes, recombinant Proteins, and other special bio products.	PO11	3

Syllabus

Introduction to basics of biotechnology - A historical overview on scope and development of biotechnology and their products; Biotechnology as an interdisciplinary enterprise; A brief survey of organisms, processes, products and market economics relating to modern industrial biotechnology; Concepts of tools and techniques used in biotechnology; Outline and integrated bioprocesses and various unit operations (upstream and downstream) involved in the bioprocesses. Generalized process flow sheets. Media, Screening and Strain improvement - Medium requirements for fermentation process- carbon, nitrogen, minerals, vitamins and other nutrients- examples of simple and complex media; Industrial substrates. Primary and Secondary screening. Strain improvement by Physical, Chemical and Molecular techniques. Production of Primary Metabolites - A brief outline of processes for the production of some commercially important Organic acids (e.g., Citric acid, Lactic acid , Acetic acid, Gluconic acid); Amino acids (Glutamic Acid, Lysine, Aspartic Acid and Phenylalanine); and Alcohols (Ethanol, 2,3-butanediol) Secondary Metabolites- Study of production processes and flow sheets for various classes of low molecular weight secondary metabolites: Antibiotics-beta- lactams (Penicillin's), aminoglycosides (Streptomycin), Macrolids (Erythromycin), Quinines and aromatics. Vitamin B12 and steroids, Dual or multiple fermentation. Enzymes, Recombinant Proteins, Special bioproducts- Enzymes- Protease,; Concept of SSF, Advantages and disadvantages,Production of Recombinant Proteins- Insulin and Special Bioproducts- Biopesticides; Biofertilizers Natural Biopreservatives (Nisin); Biopolymers (Xanthan Gum); Single cell protein, High Fructose Corn Syrup; process ofbioleaching

Industrial Pharmacy

SDG 9

Course code: 22PY3123T | L-T-P-S: 3-1-0-0 | Credits: 4 | Programme: B.Pharmacy

CO	Course Outcome	PO / PSO	BTL
CO1	Understand about Physicochemical properties of drug that influences the performance of drug and dosage from.	PO2	2
CO2	Understand the formulation, manufacturing, evaluation of tablets, liquid orals, capsules and pelletization.	PO2	2
CO3	Understand different considerations related to parenterals and ophthalmic products	PO2	2
CO4	Apply the formulation, preparation and evaluation of cosmetics and aerosols. A note on packaging materials for pharmaceutical products	PO2	3

Syllabus

Preformulation Studies: Introduction to preformulation, goals and objectives, study of physicochemical characteristics of drug substances. Physical properties: Physical form (crystal & amorphous), particle size, shape, flow properties, solubility profile (pKa, pH, partition coefficient), polymorphism. Chemical Properties: Hydrolysis, oxidation, reduction, racemisation, polymerization BCS classification of drugs & its significant. Application of preformulation considerations in the development of solid, liquid oral and parenteral dosage forms and its impact on stability of dosage forms. Tablets: Introduction, ideal characteristics of tablets, classification of tablets. Excipients, Formulation of tablets, granulation methods, compression and processing problems. Equipment and tablet tooling. Tablet coating: Types of coating, coating materials, formulation of coating composition, methods of coating, equipment employed and defects in coating. Quality control tests: In process and finished product tests. Liquid orals: Formulation and manufacturing consideration of syrups and elixirs suspensions and emulsions; Filling and packaging; evaluation of liquid orals official in pharmacopoeia Capsules: Hard gelatin capsules: Introduction, Production of hard gelatin capsule shells. size of capsules, Filling, finishing and special techniques of formulation of hard gelatin capsules, manufacturing defects. In process and final product quality control tests for capsules. Soft gelatin capsules: Nature of shell and capsule content, size of capsules, importance of base adsorption and minim/gram factors, production, in process and final product quality control tests. Packing, storage and stability testing of soft gelatin capsules and their applications. Pellets: Introduction, formulation requirements, pelletization process, equipment for manufacture of pellets. Parenteral Products: Definition, types, advantages and limitations. Preformulation factors and essential requirements, vehicles, additives, importance of isotonicity, Production procedure, production facilities and controls, aseptic processing, Formulation of injections, sterile powders, large volume parenterals and lyophilized products. Containers and closures selection, filling and sealing of ampoules, vials and infusion fluids. Quality control tests of parenteral products. Ophthalmic Preparations: Introduction, formulation considerations; formulation of eye drops, eye ointments and eye lotions; methods of preparation; labeling, containers; evaluation of ophthalmic preparations. Cosmetics: Formulation and preparation of the following cosmetic preparations: lipsticks, shampoos, cold cream and vanishing cream, tooth pastes, hair dyes and sunscreens. Pharmaceutical Aerosols: Definition, propellants, containers, valves, types of aerosol systems; formulation and manufacture of aerosols; Evaluation of aerosols; Quality control and stability studies. Packaging Materials Science: Materials used for packaging of pharmaceutical products, factors influencing choice of containers, legal and official requirements for containers, stability aspects of packaging materials, quality control tests.

Industrial Pharmacy-ii

SDG 9

Course code: 22PY4134T | L-T-P-S: 3-1-0-0 | Credits: 4 | Programme: B.Pharmacy

CO	Course Outcome	PO / PSO	BTL
CO1	Understand the process of pilot plant and scale up of pharmaceutical dosage forms	PO1,PO4	2
CO2	Understand the process of technology transfer from lab scale to commercial batch	PO1,PO4	2
CO3	Understand different Laws and Acts that regulate pharmaceutical industry	PO1,PO4	2
CO4	Application of the approval process and regulatory requirements for drug products	PO1,PO4	3

Syllabus

Pilot plant scale up techniques: General considerations - including significance of personnel requirements, space requirements, raw materials, Pilot plant scale up considerations for solids, liquid orals, semi solids and relevant documentation, SUPAC guidelines, Introduction to platform technology. Technology development and transfer: WHO guidelines for Technology Transfer(TT): Terminology, Technology transfer protocol, Quality risk management, Transfer from R & D to production (Process, packaging and cleaning), Granularity of TT Process (API, excipients, finished products, packaging materials) Documentation, Premises and equipment, qualification and validation, quality control, analytical method transfer, Approved regulatory bodies and agencies, Commercialization - practical aspects and problems (case studies), TT agencies in India - APCTD, NRDC, TIFAC, BCIL, TBSE / SIDBI; TT related documentation -confidentiality agreement, licensing, MoUs, legal issues. Regulatory affairs: Introduction, Historical overview of Regulatory Affairs, Regulatory authorities, Role of Regulatory affairs department, Responsibility of Regulatory Affairs Professionals. Regulatory requirements for drug approval: Drug Development Teams, Non-Clinical Drug Development, Pharmacology, Drug Metabolism and Toxicology, General considerations of Investigational New Drug (IND) Application, Investigator's Brochure (IB) and New Drug Application (NDA), Clinical research BE studies, Clinical Research Protocols, Biostatistics in Pharmaceutical Product Development, Data Presentation for FDA Submissions, Management of Clinical Studies. Quality management systems: Quality management & Certifications: Concept of Quality, Total Quality Management, Quality by Design (QbD), Six Sigma concept, Out of Specifications (OOS), Change control, Introduction to ISO 9000 series of quality systems standards, ISO 14000, NABL, GLP. Indian Regulatory Requirements: Central Drug Standard Control Organization (CDSCO) and State Licensing Authority: Organization, Responsibilities, Certificate of Pharmaceutical Product (COPP), Regulatory requirements and approval procedures for New Drugs.

Insights to Sustainable Development Goals

SDG 9

Course code: 25UC0032E | L-T-P-S: 2-0-0-0 | Credits: 0 | Programme: All B.Tech Programs

CO	Course Outcome	PO / PSO	BTL
CO1	Understand sustainable development — concept, pillars, and the road to the SDGs.	PO6, PO7, PSO1	2
CO2	Understand the 17 SDGs, their targets, and their interlinkages.	PO6, PO7, PSO1	2
CO3	Analyze the people-and-prosperity SDGs in the Indian and global context.	PO6, PO7, PSO2	4
CO4	Analyze the planet SDGs — climate, energy, water, and ecosystems.	PO6, PO7, PSO2	4
CO5	Apply SDG measurement, governance, and localisation.	PO7, PO11, PSO2	3
CO6	Analyze how technology, AI, and innovation can accelerate the SDGs.	PO5, PO7, PSO2	4

Syllabus

Module 1: Foundations of Sustainable Development. Topics: What sustainable development means; The Brundtland definition; The three pillars - economic, social, environmental; Planetary boundaries; From MDGs to SDGs; The 2030 Agenda and 'leave no one behind'; Sustainability vs growth debates; India's sustainability context. Labs: Map a real project against the three pillars of sustainability; Footprint lab: estimate and reduce a sustainability footprint. Case Study: a development-vs-environment trade-off (e.g., a dam/infrastructure project): analyse how the three pillars of sustainability were balanced or violated.

Module 2: The 17 SDGs Overview. Topics: Overview of all 17 goals; Targets and indicators; The SDG 'wedding cake' model; Interlinkages and trade-offs among goals; Synergies across goals; 'Leave no one behind'; The global indicator framework; Tracking progress. Labs: Build an SDG interlinkage map for a chosen development problem; Indicator lab: interpret SDG progress data for a country/state. Case Study: SDG interlinkages in practice (e.g., clean energy enabling health and education): analyse how progress on one goal advances others.

Module 3: People & Prosperity SDGs. Topics: No poverty and zero hunger; Good health and well-being; Quality education; Gender equality; Decent work and economic growth; Reduced inequalities; Industry, innovation, and infrastructure; India's progress on people/prosperity goals. Labs: Analyse a region's people/prosperity indicators and gaps; Design an intervention targeting a people/prosperity SDG. Case Study: an Indian social initiative (e.g., a health/education/livelihood program): analyse its SDG contribution and outcomes.

Module 4: Planet SDGs. Topics: Clean water and sanitation; Affordable and clean energy; Climate action; Life below water; Life on land; Sustainable cities and communities; Responsible consumption and production; Circular economy. Labs: Audit a setting for responsible consumption and propose circular fixes; Design a planet-SDG (energy/water/waste) solution for a community. Case Study: a clean-energy or water initiative in India (e.g., solar mission / river rejuvenation): analyse its planet-SDG impact and scalability.

Module 5: Partnership, Governance & Measurement. Topics: Peace, justice, and strong institutions (SDG16); Partnerships for the goals (SDG17); Financing the SDGs; Indicators and the SDG India Index; Localising the SDGs; Voluntary National Reviews; Role of governments, business, and civil society; Accountability and reporting. Labs: Build an SDG scorecard for an organisation/community; Design a multi-stakeholder partnership for an SDG target. Case Study: the SDG India Index / a state's SDG localisation: analyse how SDGs are measured and localised, and what drives improvement.

Module 6: Technology, AI & Innovation for the SDGs. Topics: Technology as an SDG accelerator; AI for good - use cases across goals; Social entrepreneurship and impact ventures; Frugal and inclusive innovation; Digital public infrastructure for development; Measuring impact (theory of change); The engineer's and youth's role; Designing an SDG-aligned solution. Labs: Design a technology/AI-enabled solution mapped to an SDG with a theory of change; Pitch a social-impact venture targeting one or more SDGs. Case Study: AI/technology for an SDG (e.g., AI in healthcare access or precision agriculture): analyse how technology accelerates a specific goal, with its risks.