SDG 4: QUALITY EDUCATION

SDG 4 promotes inclusive and equitable quality education. Curriculum integration enhances lifelong learning, skill development, and educational access. Students understand the role of education in sustainable development. This strengthens academic and societal progress.



List of Courses mapped to SDG 4:

S.No	Course Title	Name of the Program	Justification for SDG Mapping
1	QUALITY ASSURANCE	Bachelor of Pharmacy	Introduces quality systems, standards and audit practices, building professional competence and a culture of quality in learning and practice.
2	TOTAL QUALITY MANAGEMENT	Bachelor of Business Administration	Teaches quality management and continuous-improvement principles applicable to institutions, including educational organisations.
3	RESEARCH METHODOLOGY ETHICS AND SCIENTIFIC WRITING	All B.Tech Programs	Develops research skills, academic integrity and scientific communication that support lifelong learning.
4	INSIGHTS TO SUSTAINABLE DEVELOPMENT GOALS	All B.Tech Programs	Module 3 covers Quality Education with an Indian education-initiative case study, and the course builds lifelong-learning and sustainability literacy in every B.Tech student.

Course Outcomes and Syllabus

Quality Assurance

SDG 4

Course code: 22PY3232T | L-T-P-S: 3-1-0-0 | Credits: 4 | Programme: Bachelor of Pharmacy

CO	Course Outcome	PO / PSO	BTL
CO1	Understand the importance of quality assurance in Production of quality pharmaceutical production industry	PO1/PSO1	2
CO2	Understand the importance of good manufacturing Practices in a pharmaceutical industry	PO1/PSO1	2
CO3	Understand the importance of good laboratory practices in a pharmaceutical industry	PO1/PSO1	2
CO4	Applying the concepts of documentation and validation	PO1/PSO1	3

Syllabus

Quality Assurance and Quality Management concepts: Definition and concept of Quality control, Quality assurance and GMP. Total Quality Management (TQM): Definition, elements, philosophies. ICH Guidelines: purpose, participants, process of harmonization, Brief overview of QSEM, with special emphasis on Q-series guidelines, ICH stability testing guidelines. Quality by design (QbD): Definition, overview, elements of QbD program, tools ISO 9000 & ISO14000: Overview, Benefits, Elements, steps for registration NABL accreditation: Principles and procedures. Organization and personnel: Personnel responsibilities, training, hygiene and personal records. Premises: Design, construction and plant layout, maintenance, sanitation, environmental control, utilities and maintenance of sterile areas, control of contamination. Equipment and raw materials: Equipment selection, purchase specifications, maintenance, purchase specifications and maintenance of stores for raw materials. Quality Control: Quality control test for containers, rubber closures and secondary packing materials. Good Laboratory Practices: General Provisions, Organization and Personnel, Facilities, Equipment, Testing Facilities Operation, Test and Control Articles, Protocol for Conduct of a Nonclinical Laboratory Study, Records and Reports, Disqualification of Testing Facilities Complaints: Complaints and evaluation of complaints, Handling of return good, recalling and waste disposal. Document maintenance in pharmaceutical industry: Batch Formula Record, Master Formula Record, SOP, Quality audit, Quality Review and Quality documentation, Reports and documents, distribution records. Calibration and Validation: Introduction, definition and general principles of calibration, qualification and validation, importance and scope of validation, types of validation, validation master plan. Calibration of pH meter, Qualification of UV-Visible spectrophotometer, General principles of Analytical method Validation. Warehousing: Good warehousing practice, materials management

Total Quality Management

SDG 4

Course code: 22BB32L5 | L-T-P-S: 3-0-0-0 | Credits: 3 | Programme: Bachelor of Business Administration

CO	Course Outcome	PO / PSO	BTL
CO1	Understand basic concepts associated with Quality, competitiveness and customers	PO 3	2
CO2	Understand Models, Frameworks and Approach For TQM	PO 2	2
CO3	Enable the students about Quality Design – Partnership – Performance	PO 3	2
CO4	Provide a basic understanding about the Processes Redesign/Re-Engineering	PO 2	3

Syllabus

Understanding Quality: Quality, competitiveness and customers; understanding and building quality chains; managing quality; quality starts with understanding the needs; quality in all functions. CO2: Models, Frameworks and Approach For TQM: Early TQM frameworks; the 4Ps and 3Cs of TQM – a new model; TQM approach; creating or changing the culture; effective leadership; integrating TQM into policy and strategy. Quality Design – Partnership - Performance: The quality design process; quality design for services; quality function deployment [QFD]; partnering and JIT.Processes Redesign/Re-Engineering: Process classification framework and process modelling; Business process re -engineering and methodology; Quality management systems design and models management; benchmarking and performance measurement framework; choosing benchmarking driven activities wisely.

Research Methodology Ethics and Scientific Writing

SDG 4

Course code: 24IE02RF | L-T-P-S: 2-0-2-0 | Credits: 3 | Programme: All B.Tech Programs

CO	Course Outcome	PO / PSO	BTL
CO1	To apply the fundamental concepts and methods in research and collect the data relevant to research problem	PSO1, PO1, PO2, PO3, PO8	3
CO2	To analyze the data and gather the insights of the data and testing of hypothesis	PSO2, PO1, PO2, PO3, PO8	4
CO3	To be able to format a research paper, compile and interpret the results at the end, further scope of research	PO2, PO3	4

CO	Course Outcome	PO / PSO	BTL
CO4	To be able to use the modern software tools for writing the research paper, test for plagiarism, identify suitable journal for possible publication	PO2, PO3	4
CO5	To be able to design the model by applying SPSSS to the data and interpret results obtained, test for plagiarism, prepare article/thesis using Latex	PO2, PO3	5

Syllabus

Module 1: Objectives of research, Development of a research proposal. Research Design, Research Question, Investigation Question, Measurement Issues, Hypothesis Formulation, Levels of measurement, Nominal, Ordinal, Interval, Ratio. Sampling, Characteristics of a good sample. Probability Sample, Simple Random Sample, Systematic Sample, Stratified Random Sample, Multistage sampling. Determining size of the sample, Practical considerations in sampling and sample size.

Module 2: Data Analysis, Hypothesis testing, Compilation and Interpretation of Data together with Paper Writing, Layout of a Research Paper, Impact factor of Journals, When and where to publish, Ethical issues related to publishing, Plagiarism and Self-Plagiarism.

Module 3: Elements of Preparing a Paper and a Thesis: Title,Abstract, Keywords, Acknowledgements, Symbols and Abbreviations, Introduction, Literature Review, Materials and Methods, SI Units, Mathematical Materials, Graphical and Tabular Presentation, Results and Discussion, Conclusion, Interpretation, Generalization, Scope for Future Work, Citations and List of References, and Appendixes.

Module 4: Usage of tools and techniques for Research: methods to search required information effectively, Reference Management Software like Zotero, Mendeley, Software for paper formatting like LaTeX/MS Office, Software for detection of Plagiarism.

Insights to Sustainable Development Goals

SDG 4

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.