SDG 3: GOOD HEALTH AND WELL-BEING

SDG 3 emphasizes health, well-being, and disease prevention. Integrating this SDG builds awareness of public health systems and healthcare challenges. Students understand the importance of healthy lifestyles and preventive care. This contributes to improved community health outcomes.



List of Courses mapped to SDG 3:

S.No	Course Title	Name of the Program	Justification for SDG Mapping
1	ECONOMICS OF HEALTH AND EDUCATION	Bachelor of Arts	Studies the economics of health and education, including financing, access and the link between health, learning and human development, supporting well-being outcomes.
2	ENVIRONMENTAL ECONOMICS	Bachelor of Arts	Examines how pollution and environmental degradation affect human health, and the economic valuation of and policy responses to environmental problems.
3	YOGA	All B.Tech. Programs	Promotes physical and mental well-being, stress management and a preventive, healthy lifestyle.
4	MOLECULAR BIOLOGY	B.Tech. - Biotechnology	Explains the molecular basis of disease, forming the foundation for diagnostics and therapeutics.
5	OVERVIEW OF HEALTHCARE MANAGEMENT	Master of Business Administration	Covers the organisation and administration of health services, improving access to and quality of care.
6	ARTIFICIAL INTELLIGENCE FOR HEALTHCARE	B.Tech. - Artificial Intelligence & Data Science	Applies AI to diagnosis, prediction and care delivery, supporting better health outcomes.
7	HEALTHCARE BIOTECHNOLOGY	B.Tech. - Biotechnology	Covers biotechnology-based vaccines, biologics and diagnostics that advance disease prevention and treatment.
8	INSIGHTS TO SUSTAINABLE DEVELOPMENT GOALS	All B.Tech Programs	Module 3 covers Good Health and Well-being through India-focused analysis and a health-programme case study; Module 6 looks at AI for healthcare access.

Course Outcomes and Syllabus

Economics of Health and Education

SDG 3

Course code: 22BA3208 | L-T-P-S: 4-0-0-0 | Credits: 4 | Programme: Bachelor of Arts

CO	Course Outcome	PO / PSO	BTL
CO1	The students will be able to understand the significance of health and education in human capital formation.	PO1	2
CO2	The students will be able to understand the nature and trend of health market and insurance in India.	PO2	2
CO3	The students will be able to understand the economic efficiency and cost effectiveness in health care.	PO3	2
CO4	The students will be able to understand the significance of education in human capital formation, technology and human resource development.	PO4	2

Syllabus

Role of Health and Education in Human Capital Formation- Meaning and definitions of health and education - Relationship between health, education, and human development - Concept of human capital formation its role and importance in economic development - Indicators of human development. Health market and Health insurance- Health as a Good: Demand for and supply of healthcare - Determinants of Health - Market failure in the health sector and its reasons: excludability and consumption rivalry, Tragedy of the Commons - Role of Health in Human Development - Health Insurance: its Uncertainty, Moral Hazard and Adverse Selection, Asymmetric Information and Death Spiral –Private and Public health insurance - Health Care system in India – Health insurance in India with a focus on Ayushman Bharat. Economic Efficiency and Cost Effectiveness in Health Care- Definition of Economic Evaluation - Types of economic evaluation - Costing techniques: Cost Minimization Analysis, Cost Benefit Analysis, Cost Utility Analysis, QALY & DALY, Cost Effectiveness Analysis and Willingness to Pay Approach - An overview of health policy and programmes in India including the Noon-meal Schemes for students. Education, Human Capital Formation, Technology and Human Resource Development-Role of Education in improving employment opportunities -Various indices to measure educational status: Education Index, Literacy rate, Adult Literacy Rate and Gross Enrolment ratio - Importance of Education in economic development - Education system in India. Human capital formation and socio-economic development - Knowledge revolution and Knowledge economy - New Challenges in the field of education - planning, training and skill development through education - The New Education Policy in India and its challenges.

Environmental Economics

SDG 3

Course code: 22BA3109 | L-T-P-S: 4-0-0-0 | Credits: 4 | Programme: Bachelor of Arts

CO	Course Outcome	PO / PSO	BTL
CO1	The students will be able to understand the environmental issues and remedies to mitigate these issues.	PO1	2
CO2	The students will be able to understand the environmental policies.	PO2	2
CO3	The students will be able to understand the methods and application of environmental valuation.	PO3	2
CO4	The students will be able to understand the concept of sustainable development and India’s experience in sustainable development.	PO4	2

Syllabus

Introduction Key environmental issues and problems, economic way of thinking about these problems, basic concepts from economics; Pareto optimality and market failure in the presence of externalities; property rights and other approaches. The Design and Implementation of Environmental Policy - Overview, Pigouvian taxes and effluent fees, tradable permits, implementation of environmental policies in India and international experience; transboundary environmental problems; economics of climate change. Environmental Valuation -Methods and Applications Valuation of non-market goods and services--theory and practice; measurement methods; cost-benefit analysis of environmental policies and regulations. Sustainable Development- Concepts; measurement; perspectives from Indian experience.

Yoga

SDG 3

Course code: 23SP2116 | L-T-P-S: 0-0-0-2 | Credits: 0 | Programme: All B.Tech. Programs

CO	Course Outcome	PO / PSO	BTL
CO1	Remember the history of yoga, its governing bodies, rules and regulations, and practise the asanas, pranayamas, kriyas and meditation prescribed in the course.	PO2	2

Syllabus

History of Yoga; rules and regulations. Standing asanas: Vedic Suryanamaskaras, Yogic Suryanamaskaras, Trikonasana, Parsvottanasana, Garudasana, Pasangushtasana, Vrikshasana, Utkatasana, Uddiyanabandha, Nauli.

Sitting asanas: Vajrasana, Ushtrasana, Sasankasana, Suptavajrasana, Sankhasana, Padmasana, Matsyasana, Basshapadmasana, Simhasana, Janusirsana (left), Janusirsana (right), Paschimottanasana, Purvottanasana, Akarna Dhanurasana, Ardhamatsyendrasana.

Back-laying asanas: Ekapadottanasana, Dvipadottanasana, Viparitakarani Mudra, Sarvangasana, Halasana, Chakrasana, Ekapada Pavana Muktasana, Dvipada Pavana Muktasana.

Front-laying asanas: Bhujangasana, Ekapada Salabhasana, Dvipada Salabhasana, Salabhasana, Dhanurasana, Naukasana, Sirshasana, Savasana.

Pranayamas: Nadi Sodhana, Surya Bhedana, Chandra Bhedana, Surya Chandra Bhedana, Ujjayee, Seethali, Seethkari, Kapala Bhathi, Bhasthrika, Bramari. Kriyas: Jala Neti, Vamana Dhouti. Meditation: 15 minutes.

Basic training (Surya Namaskar sequence): Step 1. Pranamasana (Prayer pose) 1. Stand at the edge of your mat, keep your feet together and balance your weight equally on both the feet. 2. Expand your chest and relax your shoulders. 3. As you breathe in, lift both arms up from the sides, and as you exhale, bring your palms together in front of the chest in prayer position. Step 2. Hastauttanasana (Raised arms pose) 1. Breathing in, lift the arms up and back, keeping the biceps close to the ears. 2. In this pose, the effort is to stretch the whole body up from the heels to the tips of the fingers. Step 3. Hastapadasana (Standing forward bend) 1. Breathing out, bend forward from the waist keeping the spine erect. 2. As you exhale completely, bring the hands down to the floor beside the feet. Step 4. Ashwa Sanchalanasana (Equestrian pose) Breathing in, push your right leg back, as far back as possible. • Bring the right knee to the floor and look up. Step 5. Dandasana (Stick pose) As you breathe in, take the left leg back and bring the whole body in a straight line. Step 6. Ashtanga Namaskara (Salute with eight parts or points) Gently bring your knees down to the floor and exhale. • Take the hips back slightly, slide forward, rest your chest and chin on the floor. • Raise your posterior a little bit. The two hands, two feet, two knees, chest and chin (eight parts of the body) should touch the floor. Step 7. Bhujangasana (Cobra pose) • Slide forward and raise the chest up into the Cobra pose. • You may keep your elbows bent in this pose with the shoulders away from the ears. • Look up at the ceiling. Step 8. Adho Mukha Svanasana (Downward facing dog pose) 1. Breathing out, lift the hips and the tailbone up to bring the body into an inverted 'V' pose. Step 9. Ashwa Sanchalanasana (Equestrian pose) 1. Breathing in, bring the right foot forward in between the two hands. 2. The left knee goes down on the floor. 3. Press the hips down and look up. Step 10. Hastapadasana (Standing forward bend) 1. Breathing out, bring the left foot forward. 2. Keep the palms on the floor. 3. You may bend the knees, if necessary Step 11. Hastauttanasana (Raised arms pose) 1. Breathing in, roll the spine up. 2. Raise the hands up and bend backward a little bit, pushing the hips slightly outward. Step 12. Tadasana (Mountain pose) • As you exhale, first straighten the body, then bring the arms down. • Relax in this position and observe the sensations in your body.

Molecular Biology

SDG 3

Course code: 22BT2108 | L-T-P-S: 3-0-0-0 | Credits: 3 | Programme: B.Tech. - Biotechnology

CO	Course Outcome	PO / PSO	BTL
CO 1	Understand the genome organization & replication	PO1	2
CO 2	Compare DNA transcription and translation mechanisms	PO2	2
CO 3	Understand the gene regulation mechanisms	PO2	2
CO4	Apply the gene expression in bacteria	PO1,PO2	3

Syllabus

Genome organization & dna structure-Nucleic acid as genetic material, transformation in pneumococcus, Hershey-Chase experiment, RNA as genetic material in viruses. Genome of prokaryotes & eukaryotes, C-Value Paradox, structural genes, regulatory genes, overlapping genes, pseudogenes, split genes. Structure of DNA-Watson & Crick's model; Types of DNA: A, B and Z- DNA; Denaturation, renaturation of DNA. DNA replication and repair-semi conservative replication apparatus, bi-directional & rolling circle replication. dna damage- Mutations, Types of Mutations, Effect of UV, Deamination, Alkylation. Repair Mechanisms- Direct Repair, Excision Repair, Mismatch Repair, SOS Repair and Recombination Repair.Mechanism of transcription and translation Prokaryotic & Eukaryotic Transcription – Initiation, Elongation and Termination; Structure of Promoters; RNA Polymerases of Prokaryotic and Eukaryotic Organisms; gene splicing and Ribozyme. Post Transcriptional Processes of Eukaryotic RNA–Processing of t-RNA, r-RNA, m-RNA. Translation in prokaryotic and Eukaryotes-Genetic code, Aminoacylation of tRNA – initiation, elongation and termination of translation, Post-translational modifications. Regulation of gene expression Regulation of Gene expression in Bacteria–Operon concept, inducible and repressible operons, positive and negative regulations, Inducer molecules, repressor molecules, co repressor molecules; Induction and catabolic repression of lac Operon in E.Coli; Repression and attenuation of trp operon in E.Coli; Absolute control by Antisense RNA's. Regulation in eukaryotes – Control by promoter, enhancer and silencers. Cis-trans elements.

Overview of Healthcare Management

SDG 3

Course code: 22MB61D0 | L-T-P-S: 3-0-0-0 | Credits: 3 | Programme: Master of Business Administration

CO	Course Outcome	PO / PSO	BTL
CO1	Understand basics of Healthcare Sector	1	2
CO2	Analyze the role of clinical and diagnostic services	1	4
CO3	Evaluate the impact of hospital operations management	6	5
CO4	Evaluate the components and process of maintaining medical record	6	5

Syllabus

A Conceptual Approach to Understanding the Healthcare Systems – Evolution – Institutional Settings. Overview of Healthcare Sector in India – Understanding the Hospital Management – Health Policy – levels of healthcare; primary, secondary and tertiary – systems of medicine – Ayurveda, Siddha, Unani, Homeopathy, Yoga, Naturopathy, etc. – Preventive and Curative medical care – General and specialty Hospitals-Pharmacopia. specialties: Overview of the functions and sphere of each specialty: oncology, general medicine, cardiothoracic, gastroenterology, urology, nephrology, radiology, psychiatry, endocrinology, neurology, ophthalmology, medical services, surgical services, operation theatre, maternity services, dental services. Hospital code of ethics, medical ethics, standards for hospitals accreditation, accreditation standards for extended care facilities. Clinical & Diagnostic Services: Outpatient Services – Accident and Emergency Services – Inpatient Services – Operation Theatre Services – Intensive Care Unit Services – Nursing Services. Diagnostic and Therapeutic Services: Laboratory Services – Radio Diagnosis and Imaging Services – Radiation Hazards – Blood Transfusion Services – infection control, mortuary services, Pharmacy Services: Role of pharmacy manager, analyzer for pharmacy, drugs management. Hospital operations management: productive systems in a hospital, Facility Location and Layout, importance of location, factors, Productivity measures, value addition, capacity utilization, productivity – capital operations, front office, billing, staffing, housekeeping, transportation, dietary services, emergency services. Medical Records – Admission – Billing – Nursing Records – Diagnostic Records – Infection Control Records – Maintenance of Operation Theatres Records – Maintenance of Intensive Care Units Records; Clinical Records – Housekeeping Records – Food Records – Engineering Records – Maintenance Records – Security Records – Fatal Documents – Mortuary Maintenance Records – Transportation – Medico Legal Records, Healthcare Information System.

Healthcare Biotechnology

SDG 3

Course code: 22BT3082 | L-T-P-S: 3-0-0-0 | Credits: 3 | Programme: B.Tech. - Biotechnology

CO	Course Outcome	PO / PSO	BTL
CO1	Acquire the knowledge of simple proteins and therapeutic agents	PO1,PO5	2
CO2	Acquire the knowledge of Human diseases	PO1,PO5	2
CO3	Describe the various vaccines used	PO1,PO5	2
CO4	Understand the applications of genetic engineering in healthcare	PO1,PO5	2

Syllabus

Simple proteins and therapeutic agents: Proteins as therapeutic agents - Choice of expression systems and optimizing gene expression - Applications, delivery and targeting of therapeutic proteins - Engineering human interferons and human growth hormones - Regulatory aspects of therapeutic proteins - Enzymes as therapeutic agents - Use of genetically engineered DNase I and alginate lyase for treatment of Cystic Fibrosis Monoclonal antibodies as therapeutic agents: Production of monoclonal antibodies - Human monoclonal antibodies, its scope and limitations - Hybrid human - Mouse antibodies - Production of antibodies in E. coli - Approaches for producing HIV therapeutic agents Human diseases: Viral and bacterial diseases - Diseases caused by protozoan and parasitic worms (helminths) - Emerging infectious diseases - Active and passive immunity – Autoimmunity- Rational of immunization - Diseases controllable by vaccination – Vaccines, designing vaccines adjuvants - Whole organisms vaccines - Attenuated viruses and bacteria - Inactivation of pathogenic organisms by heat and chemical treatment Vaccines: Bacterial polysaccharides, proteins and toxins as vaccines - Recombinant vaccines- subunit, attenuated and vector vaccines - Multivalent vaccine development against AIDS - Commercial and regulatory aspects of vaccine production and its distribution Application of genetic engineering in health care: Production of Recombinant Proteins having therapeutic and diagnostic applications, recombinant vaccine

Insights to Sustainable Development Goals

SDG 3

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

CO	Course Outcome	PO / PSO	BTL
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.