

Syllabus-2023-2024

BCA

Title of the Course	Environmental Science
Course Code	BCA-104[T]

Part A

Year	1st	Semester	1st	Credits	L	T	P	C
					2	0	2	4
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	Student must have knowledge about Language proficiency.			Co-Requisite/s	Knowledge of English language			
Course Outcomes & Bloom's Level	CO1- To remember various concept of environmental education and ecosystem and also about its functions and knowledge about the conservation of biodiversity and its importance. (BL1-Remember) CO2- To understand about natural resource, its importance and environmental impacts of human activities on natural resource. (BL2-Understand) CO3- To implement various concepts and methods from ecological and physical sciences and their application in environmental problem solving. (BL3-Apply) CO4- To gain the knowledge about the different types of pollutions and their control technologies. (BL4-Analyze) CO5- To Acquire values and attitudes towards understanding complex environmental- economic social challenges, and participating actively in solving current environmental problems and preventing the future ones. (BL5-Evaluate)							
Courses Elements	Skill Development X Entrepreneurship X Employability X Professional Ethics X Gender X Human Values ✓ Environment ✓			SDG (Goals)	SDG4(Quality education) SDG6(Clean water and sanitation) SDG7(Affordable and clean energy) SDG10(Reduced inequalities) SDG12(Responsible consumption and production) SDG13(Climate action) SDG14(Life below water) SDG15(Life on land)			

Part B

Modules	Contents	Pedagogy	Hours
Module 1	Environmental Education, Ecosystem & Ecology Environmental Education- Definition, scope, importance, Need for Public Awareness, Multidisciplinary nature of Environmental Science, Environment – Definition and its segments, (Lithosphere, Hydrosphere, Atmosphere and Biosphere) Ecology and Ecosystem: Basic concepts, Type & Components, Energy Flow, Food chain, food web, Ecological Pyramids & Biodiversity (importance, threats & conservation).	Classroom Lecture, PPTs, Videos	7
Module 2	Natural Resources Management & Energy Resources Natural Resources – Classification, Water Resources (availability, quality, water budget), Mineral Resources (distribution, availability and future perspectives), and Forest Resources and its management. Energy Resources- Classification, - Conventional (Mineral Oil, Coal and Gas), Non-Conventional (Solar, Geothermal, Wind, Nuclear, Hydrogen, Biomass Energy).	Classroom Lecture, PPTs,	8
Module 3	Environmental Pollution and Control Air pollution - Causes, Effects & Control methodologies. Water pollution – sources & effects, characteristics and treatment of waste water, Soil - Formation of soil, elementary and mineral composition, effects and abatements. Noise Pollution and Hazards	Classroom Lecture, PPTs, Videos	6
Module 4	Environmental Issues and Legislations Population Growth & Explosion, Global warming, Acid Rain, Ozone Layer depletion, Photochemical smog. Environmental legislations in India – Air Act, Water Act, Environment Protection Act & Wild life Act.	Classroom Lecture, PPTs, Videos	7
Module 5	Ethics, Solid waste Management & EIA Ethics (types & theories) and moral values, NGOs and their role in environmental preservations, Effectiveness of various religions in environmental conservation Solid waste - impacts on Society & management strategies. Environmental Impact Assessment – Methods & Process in India	Classroom Lecture, PPTs, Videos	6

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	To measure the intensity of Light at different locations in the ITM University campus by using Light Meter.	Experiments	BL4-Analyze	4
2	To measure the intensity of Noise at different places in the ITM University campus by using Sound Meter.	Experiments	BL4-Analyze	4
3	To analyze the grassland ecosystem and calculate the Important Value Index (IVI) by quadrat method.	Field work	BL2-Understand	4
4	To determine the TDS and Conductivity of the given water samples.	Experiments	BL4-Analyze	4
5	To determine the pH of given water and soil samples.	Experiments	BL4-Analyze	4
6	To determine the turbidity of given water samples.	Experiments	BL4-Analyze	4
7	To determine the strength of calcium ion in the given water sample	Experiments	BL4-Analyze	4
8	To find out the amount of Dissolved Oxygen (DO) in the given sample of water.	Experiments	BL4-Analyze	4

Part D(Marks Distribution)

Theory					
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
100	40	60	18	40	
Practical					
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
100	50	60	30	40	

Part E

Books	Chauhan, B. S. (2008b). Environmental Studies. Firewall Media. Cunningham, W., & Cunningham, M. (2014). Ebook: Environmental Science: A Global Concern. McGraw Hill.
Articles	
References Books	Peavy, H. S., Rowe, D. R., & Tchobanoglous, G. (1985b). Environmental Engineering. McGraw-Hill Publishing Company. Masters, G. M., & Ela, W. (2008). Introduction to Environmental Engineering and Science. Pearson.
MOOC Courses	
Videos	

Syllabus-2023-2024

BTech-ComputerScience

Title of the Course	Software Engineering
Course Code	CSL0303[T]

Part A

Year	2nd	Semester	3rd	Credits	L	T	P	C
					3	0	0	3
Course Type	Theory only							
Course Category	Discipline Core							
Pre-Requisite/s	student must have knowledge about basic data structures , computer organization & programming language concepts.				Co-Requisite/s			
Course Outcomes & Bloom's Level	CO1- Understand the basics of software engineering like characteristic, crisis of software and process of software engineering systems (Knowledge, Understand)(BL2-Understand) CO2- Apply the various SDLC, ER, DFD models, to collect SRS, And understand the software. (Apply).(BL3-Apply) CO3- Design the Design Strategies, Architectural Design concept for better development of software (Design).(BL6-Create) CO4- Explain various testing techniques and Analyze the concept of testing strategies (Analysis)(BL4-Analyze) CO5- Evaluating the need of Software Maintenance and Software Project Management Software, Need for Maintenance, Corrective and Perfective Maintenance, Cost of Maintenance, Software Re- Engineering, Reverse Engineering and other inter process communication tech An Overview of CASE Tools, Constructive Cost Models (COCOMO), Software Risk Analysis and Management. (Investigation).(BL5-Evaluate)							
Courses Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professional Ethics ✓ Gender X Human Values ✓ Environment X		SDG (Goals)		SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education)			

Part B

Modules	Contents	Pedagogy	Hours
Unit-1	Introduction: Introduction to Software Engineering, Software Components, Software Characteristics, Software Crisis, Software Engineering Processes, Similarity and Differences from Conventional Engineering Processes, Software Quality Attributes. Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models.	Lecturing	6
Unit-2	Planning: Software Requirement Specifications (SRS) Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modeling, Data Flow Diagrams, Entity Relationship Diagrams, Decision Tables, SRS Document, Software Quality Assurance (SQA); Verification and Validation, SQA Plans, Software Quality Frameworks, ISO 9000 Model.	Case Study	6
Unit-3	Design: Basic Concept of Software Design, Architectural Design, Low Level Design: Modularization, Design Structure Charts, Pseudo Codes, Flow Charts, Coupling and Cohesion Measures, Design Strategies; Function Oriented Design, Object Oriented Design, Top-Down and Bottom-Up Design. Software Measurement and Metrics: Various Size Oriented Measures: Function Point (FP) Based Measures, Cyclomatic Complexity.	Case Study	6
Unit-4	Testing: Software Testing, Testing Objectives, Unit Testing, Integration Testing, Acceptance Testing, Regression Testing, Testing for Functionality and Testing for Performance, Top-Down and Bottom-Up Testing Strategies: Test Drivers and Test Stubs, Structural Testing (White Box Testing), Functional Testing (Black Box Testing), Test Data Suit Preparation, Alpha and Beta Testing of Products. Static Testing Strategies: Formal Technical Reviews (Peer Reviews), Walk Through, Code Inspection, Compliance with Design and Coding Standards.	Case Study	6
Unit-5	Maintenance: Software Maintenance and Software Project Management Software as an Evolutionary Entity, Need for Maintenance, Categories of Maintenance: Preventive, Corrective and Perfective Maintenance, Cost of Maintenance, Software Re- Engineering, Reverse Engineering. Software Configuration Management, An Overview of CASE Tools, Constructive Cost Models (COCOMO), Software Risk Analysis and Management.	Lecturing	6

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
2,3,4	Case study	Case Study	BL5-Evaluate	15

Part D(Marks Distribution)

Theory					
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
100	40	60	18	40	
Practical					
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
100	0	40	12	60	18

Part E

Books	Pressman, R. S., & Dr. B. R. M. (2014, January 23). Software Engineering: A Practitioner's Approach. McGraw-Hill Education. http://books.google.ie/books?id=i8NmnAEACAAJ&dq=R.+S.+Pressman&hl=&cd=1&source=gbs_api (Pressman & Dr, 2014)
Articles	
References Books	Pressman, R. S., & Dr. B. R. M. (2014, January 23). Software Engineering: A Practitioner's Approach. McGraw-Hill Education. http://books.google.ie/books?id=i8NmnAEACAAJ&dq=R.+S.+Pressman&hl=&cd=1&source=gbs_api (Pressman & Dr, 2014)
MOOC Courses	
Videos	https://onlinecourses.nptel.ac.in/noc20_cs68/preview

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	1	-	-	-	-	-	-	-	1	-	2
CO2	1	-	-	-	1	2	-	-	-	-	-	-	1	2	3
CO3	2	1	-	-	1	-	-	-	-	-	-	-	3	2	3
CO4	2	2	-	3	1	-	-	-	-	-	-	-	3	2	3
CO5	2	2	-	2	1	-	-	-	-	-	-	-	3	2	3
CO6	1	1	2	3	2	2	-	-	-	2	-	-	3	3	3

Syllabus-2023-2024

BTech-ComputerScience

Title of the Course	Making of Modern India
Course Code	MCL0101[T]

Part A

Year	1st	Semester	1st	Credits	L	T	P	C
					2	0	0	2
Course Type	Theory only							
Course Category	Ability Enhancement Courses							
Pre-Requisite/s	<p>1. "Understanding of Indian Culture and History": Before delving into the idea of India in a historical perspective, readers should have a foundational understanding of Indian culture, including its commonalities, diversities, and the concept of unity in diversity. Familiarity with cultural accommodations and conflicts within India's historical context is essential, along with an understanding of the role of Indian intelligentsia in shaping these concepts. 2. "Knowledge of Indian Nationalism's Foundations": To grasp the emergence and growth of Indian nationalism, readers should be acquainted with its anti-colonial basis, economic nationalism, and the dynamics of communalism and nationalism. Understanding revivalism, Enlightenment values, and the influence of European nationalism on Indian nationalism provides crucial context. 3. "Awareness of Social Reform Movements": Before studying social reform movements in India, readers should have knowledge of the British colonial rule's impact on Indian society and the introspection it prompted. Familiarity with key figures such as Raja Rammohan Roy, Swami Vivekananda, and the issues of women's rights and the caste system is necessary. 4. "Understanding of the Indian National Movement": Readers should have a basic understanding of the Indian National Movement, including early revolts, the significance of the 1857 revolt, and the role of early nationalists. Knowledge of movements led by Gandhi, socialist and left trends, and the integration of princely states into the nation is crucial, as is an understanding of the partition and India's journey to independence. 5. "Knowledge of Post-Independence India": To comprehend India after independence, readers should understand the making of the Indian Constitution and the post-independence Nehru era. Familiarity with India's experiences facing wars, its economic trajectory from planning to the liberalization, privatization, and globalization (LPG) era, along with its achievements and challenges in the 21st century, provides essential context for understanding contemporary India.</p>			Co-Requisite/s		<p>1. "Understanding of Colonialism and Imperialism": Before delving into Indian nationalism and social reform movements, readers should have a grasp of colonialism and imperialism, particularly their impact on India. Knowledge of how colonial powers governed and exploited colonized nations provides context for understanding the emergence of nationalist sentiments and the need for social reforms. 2. "Familiarity with Global History and Movements": Readers should have a basic understanding of global history and movements, including the Enlightenment, industrialization, and the rise of nationalist movements worldwide. This broader perspective helps contextualize India's historical developments within the global framework of political and social change. 3. "Knowledge of Political Philosophy and Ideologies": To comprehend Indian nationalism and the Indian National Movement, readers should be familiar with political philosophies and ideologies such as liberalism, socialism, and nationalism. Understanding these ideologies helps in analyzing the motivations, goals, and strategies of Indian nationalist leaders and movements. 4. "Awareness of Socio-Economic Structures": Before studying post-independence India and its economic trajectory, readers should have an understanding of socio-economic structures and systems, including feudalism, capitalism, and socialism. This knowledge provides insights into the challenges and strategies involved in India's economic development and policy-making. 5. "Understanding of International Relations": To understand post-independence India's experiences facing wars and its role in the global arena, readers should have a basic understanding of international relations theories and concepts. Knowledge of geopolitics, alliances, and global conflicts helps in analyzing India's foreign policy decisions and its place in the international community.</p>		
Course Outcomes & Bloom's Level	<p>CO1- 1. : Students will gain a comprehensive understanding of India's historical evolution, including its cultural diversity, unity in diversity, accommodations, conflicts, and the role of the Indian intelligentsia. They will grasp how these factors shaped the idea of India, particularly in the context of British rule. (BL2-Understand)</p> <p>CO2- 2. : Students will critically analyze the development of Indian nationalism, exploring its anti-colonial basis, economic nationalism, communalism, revivalism, and the influences of Enlightenment values and European nationalism. They will understand the complex factors contributing to the emergence and growth of Indian nationalism. (BL4-Analyze)</p> <p>CO3- 3. Students will appreciate the significance of social reform movements in 19th-century India, understanding the contributions of key figures such as Raja Rammohan Roy and Swami Vivekananda. They will recognize the importance of addressing issues like women's rights and the caste system within the context of British rule and Indian introspection. (BL5-Evaluate)</p> <p>CO4- 4. : Students will understand the dynamics of the Indian National Movement, including early revolts, the 1857 revolt, the role of early nationalists, Gandhi-led mass movements, socialist and left trends, and the integration of princely states. They will comprehend the complexities and strategies involved in India's journey to independence. (BL2-Understand)</p> <p>CO5- 5. Students will analyze the trajectory of India after independence, examining the making of the Indian Constitution, the post-independent Nehru era, India's experiences facing wars, and its economic transition. They will evaluate India's achievements and challenges in the 21st century, gaining insights into its socio-economic and political landscape. (BL3-Apply)</p>							
Courses Elements	<p>Skill Development X Entrepreneurship X Employability X Professional Ethics X Gender X Human Values ✓ Environment X</p>		SDG (Goals)		<p>SDG1(No poverty) SDG3(Good health and well-being) SDG4(Quality education) SDG5(Gender equality) SDG10(Reduced inequalities) SDG15(Life on land)</p>			

Part B

Modules	Contents	Pedagogy	Hours
1	Idea of India in historical perspective a) Indian culture, b) cultural commonness, c)cultural diversities, d)unity in diversity, e) cultural accommodations, f) cultural conflicts, g)Idea of India and British Rule, h) Role of Indian Intelligentsia.		6
2	Emergence and growth of Indian Nationalism a) Anti-colonial basis, b) Economic Nationalism, c) communalism and nationalism, d) revivalism and Indian nationalism, e)Enlightenment values, f)European Nationalism and Indian Nationalism.		6
3	Social Reform Movements (a) British Rule and Indian introspection, (b) Raja Rammohan Roy, (c) social reform movements in 19th century, (d)Swami Vivekanand, (e)The women issue, (f)Caste system.		6
4	Indian National Movement (a) Early Revolts and 1857 Revolt, (b)Early Nationalists, (c) Bang Bhang Movement ,(d) Gandhi led Mass Movements, (e) Socialist and Left trends, (f) Princely States and their integration into nation, (h)Partition and Independence .		6
5	India after independence a) Making of Indian Constitution, (b) Post Independent Nehru Era, (c) India facing Wars, (d) Indian economy- From Planning to LPG, (e) Achievements, (f) Challenges in 21st century India.		6

Part D(Marks Distribution)

Theory					
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
100	40	40	12	60	28
Practical					
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
	0	0			

Syllabus-2023-2024

BTech-ElectricalEngineering

Title of the Course	Environmental Pollution and global issues
Course Code	MCL0201

Part A

Year	1st	Semester	2nd	Credits	L	T	P	C
					2	1	0	3
Course Type	Theory only							
Course Category	Foundation core							
Pre-Requisite/s	Basic knowledge of natural resources, biodiversity, ecological succession, energy flow, environmental issues and problems.			Co-Requisite/s	A detailed understanding of the complexity of environment and its challenges and solutions to these problems and challenges.			
Course Outcomes & Bloom's Level	CO1- CO1. Develop environmental scientists and engineers and sensitize them towards environmental issues. (BL2-Understand) CO2- CO2. To acquire analytical skills in assessing environmental impacts through a multidisciplinary approach (BL3-Apply) CO3- CO3. Ability to distinguish between various methods of various pollution analysis (BL4-Analyze) CO4- CO4. Acquire expertise and skills needed for the Environmental Management Systems and techniques of monitoring, Environment audit, Environmental Impact Analysis, environment instrumentation and control systems and for the projects development, implementation, and maintenance. (BL5-Evaluate) CO5- CO5. Students acquire skills for to communicate, prepare, plan and implement the environmental management project (BL6-Create)							
Courses Elements	Skill Development X Entrepreneurship X Employability ✓ Professional Ethics X Gender X Human Values ✓ Environment ✓		SDG (Goals)	SDG2(Zero hunger) SDG3(Good health and well-being) SDG5(Gender equality) SDG6(Clean water and sanitation) SDG7(Affordable and clean energy) SDG8(Decent work and economic growth) SDG10(Reduced inequalities) SDG11(Sustainable cities and economies) SDG12(Responsible consumption and production) SDG13(Climate action) SDG14(Life below water) SDG15(Life on land) SDG16(Peace Justice and strong institutions) SDG17(Partnerships for the goals)				

Part B

Modules	Contents	Pedagogy	Hours
Unit – 1 (Environment, Ecosystem and Environmental Education)	Environment – Definition and its segments, (Lithosphere, Hydrosphere, Atmosphere and Biosphere). Multidisciplinary nature of Environmental Science, Ecology and Ecosystem: Basic concepts, functions of ecosystem, Energy Flow, Food chain, food web, Ecological Pyramids, Ecological Successions. Environmental Education- Definition, scope, importance, Need for Public Awareness, Environmental Ethics. Environmental Impact Assessment: Screening, Scoping, Base line Analysis, Impact Mitigation, Documentation, Review, Public hearing, Post Project Monitoring.	Lecture with ppt., Diagrams, Flowchart depiction on whiteboard during online/offline lectures, Audio/Video clips, discussion (questions & answers section)	8
Unit – 2 (Natural Resources Management)	Natural Resources – Classification, Water Resources (availability, quality, water budget), Mineral Resources (distribution, availability and future perspectives), and Forest Resources. Energy Resources- Classification and alternatives of conventional energy resources- Solar, working of solar photovoltaic cells, Geothermal, Wind energy, Nuclear Energy, Biomass and Bio-gas	Lecture with ppt., Diagrams, Flowchart depiction on whiteboard during online/offline lectures, Audio/Video clips, Group discussion.	8
Unit – 3 (Water, Soil & Noise Pollution)	Water pollution – sources & effects, characteristics and treatment of waste water, engineered systems for water purification: Aeration, solid separation, settling operations, filtration and disinfection. Soil - formation of soil, elementary and mineral composition, types of soil in India, soil pollution, effects and abatements. Noise Hazards: Continuous and impulse noise, Effect of noise on man, Measurement and evaluation of Noise, noise isolation and absorption techniques, silencers, practical aspects of noise.	Lecture with ppt., Diagrams, Flowchart depiction on whiteboard during online/offline lectures, Audio/Video clips, Group discussion.	8
Unit – 4 (Atmospheric chemistry and Air Pollution)	Classification, sources and toxic effects of air pollutants, dispersal of air pollutants, engineered systems for air purification: Atmospheric cleansing process, approaches to contamination control. Air pollutants with emphasis on reactive intermediates in atmosphere like hydroxyl radical, ozone and nitrate radical, types of hydrocarbon in the troposphere, reaction of organic compounds in the atmosphere.(Green house gas effect, Global warming, Climate change).	Lecture with ppt., Diagrams, Flowchart depiction on whiteboard during online/offline lectures, Audio/Video clips, Group discussion.	8
Unit – 5 (Waste Management)	Solid waste: Generation and waste characterization. Collection, storage and transport. Waste disposal, waste processing techniques, reduction, reuse and recycling, resource recovery and utilization. Physical and chemical treatment methods and composting. Hazardous waste management and treatment.	Lecture with ppt., Diagrams, Flowchart depiction on whiteboard during online/offline lectures, Audio/Video clips, Group discussion. Field visits. Industrial Visit (MSW/BMW/STP/ETP)	8

Part D(Marks Distribution)

Theory					
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
100		60	30	40	20
Practical					
Total Marks	Minimum Passing Marks	External Evaluation	Min. External Evaluation	Internal Evaluation	Min. Internal Evaluation
	0				

Part E

Books	Environmental Science by B. S. Chauhan; Firewall Media, 2008 • Environmental Science by Cuningham and Cuningham; McGraw-Hill Education; 13th edition (16 February 2014) • Environmental Engineering by S. K. Dhameja; S. K. Kataria & Sons, 2009 • Environmental Science by Richard T Wright; Benjamin-Cummings Pub Co.
Articles	
References Books	Environmental Engineering by Howards S Peavy, Donald R Rowe, T. George • Environmental Science & Engineering by Gilbert M. Master • Environmental Chemistry by Stanley
MOOC Courses	
Videos	

