



**Key Indicator – 1.3 Curriculum Enrichment**  
**(50)**

1.3.1 Institution integrates cross-cutting issues relevant to Professional Ethics, Gender, Human Values, Environment & Sustainability and other value framework enshrined in Sustainable Development goals and National Education Policy – 2020 into the Curriculum  
**(15)**

**Criterion 1 – Curricular Aspects**  
**(150)**

## 1.3.1 (b)

## NAME OF THE SCHOOL - School of Engineering &amp; Technology

YEAR - 2019-20 to 2023-24

Category	Name of the Course	Relevance/Description of Courses
Environment and sustainability	Environmental Engineering-1	<p>It is a multidisciplinary course focused on applying scientific and engineering principles to improve and protect environmental quality. It emphasizes the design and implementation of sustainable solutions for managing water, air, and land resources.</p> <p>Key topics include pollution control, waste management, environmental impact assessment, and sustainable development practices. The course plays a vital role in promoting environmental stewardship and supports global efforts toward achieving sustainability goals by ensuring a balance between human development and ecological preservation.</p>
Environment and sustainability	Environmental Engineering-2	<p>It is a multidisciplinary course focused on applying scientific and engineering principles to improve and protect environmental quality. It emphasizes the design and implementation of sustainable solutions for managing water, air, and land resources.</p> <p>Key topics include pollution control, waste management, environmental impact assessment, and sustainable development practices. The course plays a vital role in promoting environmental stewardship and supports global efforts toward achieving sustainability goals by ensuring a balance between human development and ecological preservation.</p>
Environment and sustainability	Environmental Studies	<p>It is an interdisciplinary course that explores the relationship between humans and the natural environment. It covers topics such as ecosystems, biodiversity, natural resource management, pollution, and climate change.</p> <p>The course aims to raise awareness about environmental issues and encourages sustainable practices at individual, community, and global levels. By integrating science, policy, and ethics, Environmental Studies fosters a deeper understanding of how to protect the environment and promote sustainability for present and future generations.</p>



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<b>Environment and sustainability</b>	<b>Non Conventional Energy Resources</b>	<p>It is a course that focuses on alternative energy sources such as solar, wind, biomass, geothermal, and tidal energy. These resources are sustainable, renewable, and environmentally friendly, offering viable solutions to reduce dependence on fossil fuels.</p> <p>The course emphasizes the role of non-conventional energy in mitigating climate change, reducing greenhouse gas emissions, and promoting energy security. It supports the transition toward a cleaner and more sustainable energy future, aligning with global environmental and sustainability goals.</p> <p>It is an interdisciplinary course that explores the relationship between humans and the natural environment. It covers topics such as ecosystems, biodiversity, natural resource management, pollution, and climate change.</p> <p>The course aims to raise awareness about environmental issues and encourages sustainable practices at individual, community, and global levels. By integrating science, policy, and ethics, Environmental Studies fosters a deeper understanding of how to protect the environment and promote sustainability for present and future generations.</p>
<b>Environment and sustainability</b>	<b>Environmental Science</b>	<p>Environmental Geo-technology is a specialized course that combines geotechnical engineering with environmental science to address issues related to soil, groundwater, and waste management. It focuses on the assessment, design, and remediation of contaminated sites, landfill engineering, and the sustainable use of earth materials.</p> <p>The course plays a key role in minimizing environmental impact, managing land resources responsibly, and supporting sustainable development by integrating eco-friendly engineering practices into ground-related environmental challenges.</p>



  
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<b>Environment and sustainability</b>	<b>Environmental Impact Assessment</b>	<p>It Environmental Impact Assessment (EIA) is a course that trains students to evaluate the potential environmental effects of proposed projects or developments before they are carried out. It involves the systematic analysis of ecological, social, and economic impacts, helping to identify and mitigate negative consequences.</p> <p>The course supports sustainable development by ensuring that environmental considerations are integrated into planning and decision-making processes, promoting responsible and environmentally sound project implementation.</p> <p>It is a course that examines how individuals and groups act within organizations, with a focus on improving workplace effectiveness and well-being. In relation to human values, the course emphasizes ethical behavior, respect, empathy, integrity, and social responsibility.</p> <p>It fosters a positive organizational culture by promoting trust, teamwork, and leadership grounded in strong moral principles. Understanding human values through this course helps create more inclusive, respectful, and value-driven workplaces.</p>
<b>Human Values</b>	<b>Organizational Behaviour</b>	<p>It is a course that focuses on effectively conveying technical information in written, oral, and visual forms. In relevance to human values, it emphasizes clarity, honesty, responsibility, and respect in communication.</p> <p>The course promotes ethical practices by encouraging accurate, transparent, and audience-sensitive communication, which is essential in professional and technical settings. By integrating human values, it helps build trust, understanding, and collaboration among diverse stakeholders.</p>
<b>Human Values</b>	<b>Technical Communication</b>	



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<b>Human Values</b>	<b>Universal Human Values</b>	<p>It is a foundational course that explores the essential principles and values that guide human behavior, such as truth, love, peace, righteousness, and non-violence. It encourages self-reflection, empathy, and ethical living, aiming to develop a deeper understanding of oneself and one's responsibilities toward others and the environment.</p> <p>In relevance to human values, the course promotes holistic development, harmonious relationships, and sustainable living, fostering a value-based approach to personal and professional life.</p>
<b>Professional Ethics</b>	<b>Professional Ethics in Engineering</b>	<p>Professional Ethics in Engineering is a course that addresses the ethical responsibilities and moral principles guiding engineers in their professional practice. It covers topics such as integrity, accountability, safety, fairness, and respect for stakeholders.</p> <p>In relevance to professional ethics, the course emphasizes making ethical decisions, adhering to codes of conduct, and balancing technical excellence with social responsibility. It prepares engineers to act with professionalism and uphold public trust while contributing to sustainable and ethical technological development.</p>
<b>Professional Ethics</b>	<b>Technical Communication</b>	<p>It is a course that focuses on the effective exchange of technical information through written, oral, and visual formats. In relevance to professional ethics, it emphasizes accuracy, clarity, transparency, and accountability in communication.</p> <p>The course promotes ethical standards such as honesty in reporting data, respecting intellectual property, and maintaining confidentiality. By fostering responsible and ethical communication, it ensures that professionals convey information truthfully and respectfully, supporting informed decision-making and trust in technical fields.</p>



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<b>Professional Ethics</b>		Managerial Economics	<p>It is a course that applies microeconomic principles to business decision-making. It focuses on optimizing resource allocation, pricing strategies, production costs, and risk management in a competitive market environment.</p> <p>In relevance to professional ethics, the course emphasizes the importance of ethical decision-making, ensuring that business practices align with legal standards, social responsibilities, and fairness. Managers are encouraged to consider not only profit maximization but also the impact of their decisions on stakeholders, the environment, and society. Ethical considerations in pricing, marketing strategies, and labor practices are also key components of the course.</p>
<b>Professional Ethics</b>		Entrepreneurship	<p>The course "Entrepreneurship" explores the process of starting and managing new ventures, focusing on innovation, business planning, and growth strategies. In relevance to professional ethics, the course highlights the importance of integrity, transparency, and social responsibility in entrepreneurship. Entrepreneurs are encouraged to make ethical decisions that foster trust with investors, customers, and employees while contributing positively to society.</p> <p>Topics such as ethical fundraising, fair competition, responsible sourcing, and sustainable business practices are emphasized to ensure that entrepreneurial endeavors align with both profit and ethical standards.</p>
<b>Professional Ethics</b>		7 habits of highly effective people	<p>The course "7 Habits of Highly Effective People," based on Stephen Covey's popular framework, focuses on personal and professional development through principles of self-discipline, leadership, and proactive behavior. In relevance to professional ethics, the course emphasizes integrity, accountability, and the importance of aligning personal values with professional actions.</p> <p>It encourages individuals to foster trust and respect in the workplace, prioritize ethical decision-making, and create a positive impact through effective communication, collaboration, and responsible leadership. The habits promote a holistic approach to success that balances personal growth with ethical responsibility in professional settings.</p>




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<b>Professional Ethics</b>	<b>Elements of Management</b>	<p>The course "Elements of Management" covers the fundamental principles and practices involved in planning, organizing, leading, and controlling within an organization. It explores key management functions, decision-making processes, and strategies for achieving organizational goals.</p> <p>In relevance to professional ethics, the course emphasizes the importance of ethical leadership, transparency, fairness, and accountability in management practices. It encourages future managers to make decisions that uphold integrity, foster a positive organizational culture, and ensure that the welfare of employees, customers, and other stakeholders is prioritized alongside business objectives. Ethical considerations in resource management, conflict resolution, and strategic planning are also key components of the course.</p>
<b>Professional Ethics</b>	<b>Entrepreneurship Development</b>	<p>The course "Entrepreneurship" explores the process of starting and managing new ventures, focusing on innovation, business planning, and growth strategies. In relevance to professional ethics, the course highlights the importance of integrity, transparency, and social responsibility in entrepreneurship. Entrepreneurs are encouraged to make ethical decisions that foster trust with investors, customers, and employees while contributing positively to society.</p> <p>Topics such as ethical fundraising, fair competition, responsible sourcing, and sustainable business practices are emphasized to ensure that entrepreneurial endeavors align with both profit and ethical standards.</p>
<b>Professional Ethics</b>	<b>Introduction to Managerial Economics</b>	<p>It is a course that applies microeconomic principles to business decision-making. It focuses on optimizing resource allocation, pricing strategies, production costs, and risk management in a competitive market environment.</p> <p>In relevance to professional ethics, the course emphasizes the importance of ethical decision-making, ensuring that business practices align with legal standards, social responsibilities, and fairness. Managers are encouraged to consider not only profit maximization but also the impact of their decisions on stakeholders, the environment, and society. Ethical considerations in pricing, marketing strategies, and labor practices are also key components of the course.</p>



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 <b>Sushant</b> University Erstwhile Ansal University Gurugram	School of Engineering & Technology Course Outline B.Tech CE Specialization in Smart Cities		
Course Title: Environmental Engineering- 1		Course Code: 15BCE-0EE31T	
Term: V	Academic Year: 2021-22	Core/Elective: Core	Credits:03
Course Designed by: Inderjeet Kaur e-mail: <a href="mailto:inderjeetkaur@sushantuniversity.edu.in">inderjeetkaur@sushantuniversity.edu.in</a>		Course Instructor: : Inderjeet Kaur e-mail: <a href="mailto:inderjeetkaur@sushantuniversity.edu.in">inderjeetkaur@sushantuniversity.edu.in</a>	
Pre-requisites: : Knowledge of Engg Chemistry.			

### 1. Course Outcomes:

Upon successful completion of the course, the students should be able to:

**CO1:** The importance and requirements of protected water supply.

**CO2:** How to consider a source of water for water supply to a town or city with respect to quality and quality of water.

**CO3:** Various types of useful impurities and harmful impurities present in water, the effects of harmful impurities on human health. How to treat raw water using various treatment units..

### 2. CO and PO mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
<b>CO 1</b>	H	M	H		H		H	L	M	L		M		H	L
<b>CO 2</b>	H		M	H		M		H			H	L	M	H	
<b>CO 3</b>	H		H	M		M		L	M			M			M

### 3. Syllabus

**Total hr.-40**

#### Unit-I

**Lecture hr.: 8**

#### **1. Planning for Water Supply System:**

Need for public water supply and role of engineers- Quantity of water-Different water demands- institutional and commercial demand, public uses, fire demand-estimation by kuichling's formula, freeman formula and National board of fire underwriters formula. Percapita consumption- factors affecting per capita demand.

**2. Design period and population forecast**-Arithmetic mean, Geometric mean and incremental increase method..

#### Unit-II

**Lecture hr.: 10**

- 1. Quality of water** – Concept of safe water, wholesome water, palatable water. Physical, chemic
- al and bacteriological analysis of water.** Standards of Water quality desired for domestic water supplies – BIS and WHO Standards – Health significance of fluorides, Nitrates and

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Heavy metals like mercury, cadmium, arsenic etc.. Water borne diseases. Bacterial examination of water-multiple fermentation tube and membrane filter test –MPN

**4. SOURCES & INTAKE WORKS:** Classification of sources of water supply- Choice of source- Suitability with regard to quality and quantity- Lake, river, reservoir and canal intake -Types of conduits- Capacity and design- Materials for pipes- Leakages- Types of pumps- Efficiency and choice of pumps

#### Unit-III

**Lecture hr.: 8**

**4. PLAIN SEDIMENTATION AND COAGULATION:** Theory of sedimentation; Stoke's law; Sedimentation tanks; Design aspects; Principle of coagulation; Chemicals used for coagulation; Units of coagulation plant; Optimum dose of coagulant.

**5. FILTRATION OF WATER:** Theory of filtration; Filter materials; slow sand and rapid sand filters; Construction and operation; Troubles in rapid sand filters; Pressure filters

#### Unit-IV

**Lecture hr.: 6**

**6. DISINFECTION OF WATER:** Different methods of disinfection; Chlorination; Types of chlorination; Testing of chlorine.- miscellaneous treatment methods-Water softening; Methods of removing temporary hardness; Methods of removing permanent hardness; Removal of colour, odour and taste from water; Defluoridation.

#### Unit-V

**Lecture hr.: 8**

**7. DISTRIBUTION SYSTEM:** General requirements; Classification; Methods of supply; Available pressure in the distribution system; Layouts of distribution networks; Distribution reservoirs; Functions; Types.

**8. Capacity of balancing tank;** Analysis of distribution system; Methods of analysis; Appurtenances in the distribution system; Sluice valves; Check valve; Air valve; Drain valve; Hydrants; Meters

#### **4. Text Books:**

1. Elements of Environmental engineering by Duggal, K.N., S. Chand & Company Ltd., New Delhi,
2. Environmental Engineering Vol. -Water supply engineering by Garg, S.K., Khanna Publishers, Delhi
3. Water Supply and Sanitary Engineering Vol. 1 by Gurucharan Singh, Standard Publishers Distributors, Delhi


#### **5. Reference Books**

1. Water Supply and Sanitary Engineering by Birde, G.S., Dhanpat Rai and sons, Delhi
2. Manual on Water Supply & Treatment; CPH and EEO, Ministry of Urban Development, Govt. of India, New Delhi.

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 Erstwhile Ansal University Gurugram		School of Engineering & Technology Course Outline B.Tech CE Specialization in Smart Cities	
Course Title: Environmental Engineering -2		Course Code: 15BCE-0EE32T	
Term: I	Academic Year: 2021-22	Core/Elective: Core	Credits: 3
Course Designed by: MOHD SHADAB ALAM e-mail: shadabalam@sushantuniversity.edu.in		Course Instructor: MOHD SHADAB ALAM e-mail: shadabalam@sushantuniversity.edu.in	
Pre-requisites: EE-1			

### 1. Course Outcomes:

Upon successful completion of the course, the students should be able to:

**CO1:** Ability to estimate sewage generation and design sewer system including sewage pumping stations

**CO2:** Required understanding on the characteristics and composition of sewage, self-purification of streams

**CO3:** Ability to perform basic design of the unit operations and processes that are used in sewage treatment

### 2. CO and PO mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
<b>CO 1</b>	L	M	H			M	M	L		H	M	L		H	H
<b>CO 2</b>	H	M		H	M	L		L	M		H	M		L	M
<b>CO 3</b>	H		H			H	M	L	M	M			M	L	

### 3. Syllabus

**Total hr.-40**

#### UNIT I PLANNING FOR SEWERAGE SYSTEMS

Sources of wastewater generation – Effects – Estimation of sanitary sewage flow – Estimation of storm runoff – Factors affecting Characteristics and composition of sewage and their significance – Effluent standards – Legislation requirements.

#### UNIT II SEWER DESIGN

Sewerage – Hydraulics of flow in sewers – Objectives – Design period - Design of sanitary and storm sewers – Small bore systems - Computer applications – Laying, joining & testing of sewers – appurtenances – Pumps – selection of pumps and pipe Drainage -. Plumbing System for Buildings – One pipe and two pipe system.

#### UNIT III PRIMARY TREATMENT OF SEWAGE

Objective – Selection of treatment processes – Principles, Functions, Design and Drawing of Units - Onsite sanitation - Septic tank with dispersion - Grey water harvesting – Primary

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treatment – Principles, functions design and drawing of screen, grit chambers and primary sedimentation tanks – Construction, operation and Maintenance aspects.

#### UNIT IV SECONDARY TREATMENT OF SEWAGE

Objective – Selection of Treatment Methods – Principles, Functions, Design and Drawing of Units - Activated Sludge Process and Trickling filter – Oxidation ditches, UASB – Waste Stabilization Ponds – Reclamation and Reuse of sewage - sewage recycle in residential complex - Recent Advances in Sewage Treatment – Construction and Operation & Maintenance of Sewage Treatment Plants.

#### UNIT V DISPOSAL OF SEWAGE AND SLUDGE MANAGEMENT

Standards for Disposal - Methods – dilution – Self purification of surface water bodies – Oxygen sag curve – Land disposal – Sludge characterization – Thickening – Sludge digestion – Biogas recovery

#### TEXTBOOKS:

1. Garg, S.K., "Environmental Engineering" Vol. II, Khanna Publishers, New Delhi, 2003.
2. Punmia, B.C., Jain, A.K., and Jain. A., "Environmental Engineering", Vol.II, Lakshmi Publications, New Delhi, 2005. STUCOR APP 63

#### REFERENCES:

1. "Manual on Sewerage and Sewage Treatment", CPHEEO, Ministry of Urban Development, Government of India, New Delhi, 1997.
2. Metcalf & Eddy, "Wastewater Engineering" – Treatment and Reuse, Tata McGraw Hill Company, New Delhi, 2003.
3. Karia G L & Christian R A, "Wastewater Treatment", Prentice Hall of India, New Delhi, 2013..

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**Course Outline**

**Course Title: Environmental Studies**

Semester: I	Academic Year: 2020-21	Core/Elective: Core	Credits: 2
Course Designed by: Dr. Monika Khurana E-mail:monikakhurana@sushantuniversity.edu.in		Course Instructor: Dr. Monika Khurana E-mail:monikakhurana@sushantuniversity.edu.in	
Pre-requisites: None			

**1. Course Outcomes:**

Upon successful completion of the course, the students should be able to

- CO1:** Gain knowledge on the importance of environmental education and ecosystem.
- CO2:** Discuss about environmental pollution- sources, effects and control measures of environmental pollution.
- CO3:** Understand the treatment of wastewater and solid waste management.
- CO4:** Find importance with respect to biodiversity, its threats and its conservation and appreciate the concept of interdependence.
- CO5:** Describe the national and international concern for environment for protecting the environment.

**2. Program Outcomes:**

This section deals with how well this course meets the following eight overall program outcomes (POs):

- PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and engineering. Specialization to the solution of complex engineering problems.
- PO2. Problem analysis:** Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.
- PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4. Conduct investigations of complex problems:** Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and modeling to complex engineering activities with an understanding of the limitations.



**PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

**PO10. Communication:** Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.

**PO11. Project management and finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

**PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### 3. CO and PO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	L						H	H							L
CO2							H	H		L					L
CO3				L			H	H	L	M	L				L
CO4							H	H	M	M					L
CO5				L			H	H	L	M	L				L

### 4. Syllabus:

**Total Hrs.: 30**

#### Unit 1: Introduction to environmental studies

**(2 lectures)**

- Multidisciplinary nature of environmental studies
- Scope and importance; Concept of sustainability and sustainable development.

#### Unit 2: Ecosystems

**(4 lectures)**

- What is an ecosystem?



Structure and function of ecosystem;  
Energy flow in an ecosystem: food chains, food webs and ecological succession.  
Case studies of the following ecosystems:  
a) Forest ecosystem  
b) Grassland ecosystem  
c) Desert ecosystem  
d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

### **Unit 3: Natural Resources: Renewable and Non-renewable Resources** (4 lectures)

- Land resources and land-use change; Land degradation, soil erosion and desertification.
- Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water: Use and over – exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state), Dams – benefits and problems.
- Food resources: World food problems, changes caused by agriculture and over-grazing, effects of modern agriculture, fertilizer-pesticide problems, waterlogging, salinity.
- Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies

### **Unit 4: Biodiversity and Conservation** (3 lectures)

- Levels of biological diversity: genetic, species and ecosystem diversity; Bio-geographic zones of India; Biodiversity patterns and global biodiversity hotspots.
- India as a mega-biodiversity nation; Endangered and endemic species of India, threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions.
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

### **Unit 5: Environmental Pollution** (5 lectures)

- Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution
- Nuclear hazards and human health risks
- Solid waste management: Control measures of urban and industrial waste.
- Pollution case studies

### **Unit 6: Environmental Policies & Practices** (4 lectures)

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
- Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest

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Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).

- Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

#### Unit7: Human Communities and the Environment

(4 lectures)

- Human population growth: Impacts on environment, human health and welfare. Resettlement and rehabilitation of project affected persons; case studies.
- Disaster management: floods, earthquake, cyclones and landslides.
- Water conservation, rain water harvesting, watershed management.
- Wasteland reclamation.
- Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan.
- Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).

#### Unit 8: Field Work

(4 lectures)

- Visit to an area to document environmental assets: river/forest/flora/fauna, etc.
- Visit to a local polluted site – Urban/Rural/Industrial/ Agricultural.
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystems – pond, river, Delhi Ridge, etc.

#### 1. Course References

##### Text Book:

1. Chawla S., 2012. A Textbook of Environmental Studies, Tata Mc Graw Hill, New Delhi.

##### Reference Books:

1. Jadhav, H & Bhosale, V.M., 1995. Environmental Protection and Laws. Himalaya Pub. House, New Delhi.
2. Gadi R., Rattan, S., 2006. Environmental Studies, KATSON Books, New Delhi.
3. Mckinney, M.L. & School, R.M., 1996. Environmental Science Systems & Solutions, Web enhanced edition.
4. Wanger K.D., 1998. Environmental Management. W.B. Saunders Co. Philadelphia, USA

#### 7. Evaluation Scheme

Exam Type	Marks Breakup
Mid Semester Examination	15
End Semester Examination	60



Quiz	10
Assignment	10
Faculty Assessment	5

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## Course Outline

**Course Title: Non-Conventional Energy Resources**

**Semester: VIII**

**Academic Year: 2020-21**

**Core/Elective: Elective**

**Credits: 3**

**Course Designed by: Somya Tiwari**

**E-mail: [somyatiwari@sushantuniversity.edu.in](mailto:somyatiwari@sushantuniversity.edu.in)**

**Course Instructor: Somya Tiwari**

**E-mail: [somyatiwari@sushantuniversity.edu.in](mailto:somyatiwari@sushantuniversity.edu.in)**

**Pre-requisites: None.**

### 1. Course Outcomes:

Upon successful completion of the course, the students should be able to:

**CO1:** Understanding of renewable Energy Sources, Principles of Solar Radiation, Different Methods of Solar Energy Storage and its Applications, Solar Ponds, Solar Distillation and Photo Voltaic Energy Conversion.

**CO2:** Wind Energy, Various types of Wind Mills. Bio-Conversion, Types of Bio-Gas Digesters and Utilization for Cooking.

**CO3:** Apply knowledge for Geothermal Energy Resources, Types of Wells and Methods of Harnessing the Energy, Ocean Energy and Setting of OTEC Plants

### 2. Program Outcomes:

This section deals with how well this course meets the following eight overall program outcomes (POs):

**PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and engineering. Specialization to the solution of complex engineering problems.

**PO2. Problem analysis:** Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.

**PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO4. Conduct investigations of complex problems:** Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.





**PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and modeling to complex engineering activities with an understanding of the limitations.

**PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

**PO10. Communication:** Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.

**PO11. Project management and finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

**PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### 3. CO and PO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	H	M	M	M	M			L		H		M			M
CO2	H	L	M		L	H	M		L				M		
CO3	H	M	H	H							M			M	

### 4. Syllabus:

**Total Hrs.: 40**

#### Unit-1

**Lecture Hr.: 08**

Statistics on conventional energy sources and supply in developing countries, Definition and Concepts of NCES, Limitations of RES, Criteria for assessing the potential of NCES. Classification of NCES – Solar, Wind, Geothermal, Bio-mass, Ocean Energy Sources, comparison of these energy sources.

#### Unit-2

**Lecture Hr.: 08**

Solar Energy-Energy available from Sun, Solar radiation data, Solar energy conversion into heat, Flat plate and Concentrating collectors, Mathematical analysis of Flat plate collectors and collector efficiency, Principle of Natural and Forced convection, Solar engines-Stirling, Brayton

engines, Photovoltaic, p-n junction, solar cells, PV systems, Stand-alone, Grid connected solar power satellite.

### Unit-3

**Lecture Hr.: 08**

Wind energy conversion, General formula -Lift and Drag- Basis of wind energy conversion – Effect of density, frequency variances, angle of attack, and wind speed. Windmill rotors Horizontal axis and vertical axis rotors. Determination of torque coefficient, Induction type generators- working principle.

### Unit-4

**Lecture Hr.: 8**

Nature of Geothermal sources, Definition and classification of resources, Utilization for electric generation and direct heating, Well Head power generating units, Basic features Atmospheric exhaust and condensing, exhaust types of conventional steam turbines. Pyrolysis of Biomass to produce solid, liquid and gaseous fuels, Biomass gasification, Constructional details of gasifier, usage of biogas for chulhas, various types of chulhas for rural energy needs.

### Unit-5

**Lecture Hr.: 8**

Wave, Tidal and OTEC energy- Difference between tidal and wave power generation, Principles of tidal and wave power generation, OTEC power plants, Operational of small cycle experimental facility, Design of 5 Mw OTEC pro-commercial plant, Economics of OTEC, Environmental impacts of OTEC. Status of multiple product OTEC systems.

### 5. Text Book(s):

- T1. Ashok V Desai, Non-Conventional Energy, Wiley Eastern Ltd, New Delhi, 2003 2. K M.
- T2. Non-Conventional Energy Systems, Wheeler Publishing Co. Ltd, New Delhi, 2003.

### 6. Reference Book(s):

- R1. Ramesh R & Kumar K U, Renewable Energy Technologies, Narosa Publishing House, New Delhi, 2004
- R2. Wakil MM, Power Plant Technology, Mc Graw Hill Book Co, New Delhi, 2004.
- R3. Non – Conventional Energy Sources. Rai.

### 7. Evaluation Scheme

Exam Type	Marks Breakup
Mid Semester Examination	15
End Semester Examination	60
Quiz	10
Assignment	10
Faculty Assessment	5

**Course Outline**

<b>Course Title: Environmental Science</b>		<b>Course Code: EVS2111</b>	
<b>Semester: I</b>	<b>Academic Year: 2022-23</b>	<b>Core/Elective: Core</b>	<b>Credits: 2</b>
<b>Course Designed by: Dr. Monika Khurana</b> <b>E-mail:monikakhurana@sushantuniversity.edu.in</b>		<b>Course Instructor: Dr. Monika Khurana</b> <b>E-mail:monikakhurana@sushantuniversity.edu.in</b>	
<b>Pre-requisites: None</b>			

**1. Course Outcomes:**

Upon successful completion of the course, the students should be able to

- CO1:** Gain knowledge on the importance of environmental education and ecosystem.
- CO2:** Discuss about environmental pollution- sources, effects and control measures of environmental pollution.
- CO3:** Understand the treatment of wastewater and solid waste management.
- CO4:** Find importance with respect to biodiversity, its threats and its conservation and appreciate the concept of interdependence.
- CO5:** Describe the national and international concern for environment for protecting the environment.

**2. Program Outcomes:**

This section deals with how well this course meets the following eight overall program outcomes (POs):

- PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and engineering. Specialization to the solution of complex engineering problems.
- PO2. Problem analysis:** Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.
- PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4. Conduct investigations of complex problems:** Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and modeling to complex engineering activities with an understanding of the limitations.





**PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

**PO10. Communication:** Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.

**PO11. Project management and finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

**PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### 3. CO and PO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	L						H	H							L
CO2							H	H		L					L
CO3				L			H	H	L	M	L				L
CO4							H	H	M	M					L
CO5				L			H	H	L	M	L				L

### 4. Syllabus:

Total Hrs.: 30

#### Unit 1: Introduction to environmental studies

(2 lectures)

- Multidisciplinary nature of environmental studies
- Scope and importance; Concept of sustainability and sustainable development.

#### Unit 2: Ecosystems

(4 lectures)

- What is an ecosystem?  
Structure and function of ecosystem;  
Energy flow in an ecosystem: food chains, food webs and ecological succession.

Case studies of the following ecosystems:

- a) Forest ecosystem
- b) Grassland ecosystem
- c) Desert ecosystem
- d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

**Unit 3: Natural Resources: Renewable and Non-renewable Resources (4 lectures)**

- Land resources and land-use change; Land degradation, soil erosion and desertification.
- Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water: Use and over – exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state), Dams – benefits and problems.
- Food resources: World food problems, changes caused by agriculture and over-grazing, effects of modern agriculture, fertilizer-pesticide problems, waterlogging, salinity.
- Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies

**Unit 4: Biodiversity and Conservation (3 lectures)**

- Levels of biological diversity: genetic, species and ecosystem diversity; Bio-geographic zones of India; Biodiversity patterns and global biodiversity hotspots.
- India as a mega-biodiversity nation; Endangered and endemic species of India, threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions.
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

**Unit 5: Environmental Pollution (5 lectures)**

- Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution
- Nuclear hazards and human health risks
- Solid waste management: Control measures of urban and industrial waste.
- Pollution case studies

**Unit 6: Environmental Policies & Practices (4 lectures)**

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
- Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).



- Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

#### **Unit7: Human Communities and the Environment**

**(4 lectures)**

- Human population growth: Impacts on environment, human health and welfare. Resettlement and rehabilitation of project affected persons; case studies.
- Disaster management: floods, earthquake, cyclones and landslides.
- Water conservation, rain water harvesting, watershed management.
- Wasteland reclamation.
- Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan.
- Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).

#### **Unit 8: Field Work**

**(4 lectures)**

- Visit to an area to document environmental assets: river/forest/flora/fauna, etc.
- Visit to a local polluted site – Urban/Rural/Industrial/ Agricultural.
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystems – pond, river, Delhi Ridge, etc.

#### **5. Text Book:**


1. Chawla S., 2012. A Textbook of Environmental Studies, Tata Mc Graw Hill, New Delhi.

#### **6. Reference Books:**

1. Jadhav, H & Bhosale, V.M., 1995. Environmental Protection and Laws. Himalaya Pub. House, New Delhi.
2. Gadi R., Rattan, S., 2006. Environmental Studies, KATSON Books, New Delhi.
3. Mckinney, M.L. & School, R.M., 1996. Environmental Science Systems & Solutions, Web enhanced edition.
4. Wanger K.D., 1998. Environmental Management. W.B. Saunders Co. Philadelphia, USA

#### **7. Evaluation Scheme**

<b>Exam Type</b>	<b>Marks Breakup</b>
Mid Semester Examination	15
End Semester Examination	60
Quiz	10
Assignment	10
Faculty Assessment	5

 <b>Sushant</b> University <small>Erstwhile Ansal University Gurugram</small>	<b>School of Engineering &amp; Technology</b> <b>Course Outline B.Tech CE Specialization in Smart Cities</b>		
<b>Course Title: Environmental Geo-Technology</b> <b>0EG42E</b>		<b>Course Code: 15BCE-</b>	
<b>Term: VIII</b>	<b>Academic Year: 2021-22</b>	<b>Core/Elective: Elective</b>	<b>Credits:03</b>
<b>Course Designed by: Inderjeet Kaur</b> <b>e-mail:</b> <b>inderjeetkaur@sushantuniversity.edu.in</b>		<b>Course Instructor: : Inderjeet Kaur</b> <b>e-mail:</b> <b>inderjeetkaur@sushantuniversity.edu.in</b>	
<b>Pre-requisites: : Soil Mechanics &amp; Environmental Engineering</b>			

### 1. Course Outcomes:

Upon successful completion of the course, the students should be able to:

**CO1:** Learn the basics of environmental geotechnology.

**CO2:** Analyze the role of soil in waste management

**CO3:** Field investigation relevant to waste containment

### 2. CO and PO mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
<b>CO 1</b>		H	L		M		L	L		H		M		H	M
<b>CO 2</b>	H	L	M	H		M			L		H	M		L	H
<b>CO 3</b>	H	M	H			H		M	M				M	H	

### 3. Syllabus

**Total hr.-40**

#### Unit-I

**Lecture hr.: 6**

#### **Fundamentals of Geoenvironmental**

Engineering Scope of geoenvironmental engineering - multiphase behavior of soil – role of soil in geoenvironmental applications – importance of soil physics, soil chemistry, hydrogeology, biological process – sources and type of ground contamination – impact of ground contamination on geoenvironment - case histories on geoenvironmental problems.

#### Unit-II

**Lecture hr.: 10**

#### **Soil-Water-Contaminant Interaction**

Soil mineralogy characterization and its significance in determining soil behavior – soil-water interaction and concepts of double layer – forces of interaction between soil particles. Concepts of unsaturated soil – importance of unsaturated soil in geoenvironmental problems - measurement of soil suction - water retention curves - water flow in saturated and unsaturated zone. Soil-water-

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contaminant interactions and its implications – Factors effecting retention and transport of contaminants

**Unit-III**

**Lecture hr.: 8**

**Waste Containment System**

Evolution of waste containment facilities and disposal practices – Site selection based on environmental impact assessment –different role of soil in waste containment – different components of waste containment system and its stability issues – property evaluation for checking soil suitability for waste containment – design of waste containment facilities.

**Unit-IV**

**Lecture hr.: 8**

**Contaminant Site Remediation**

Site characterization – risk assessment of contaminated site - remediation methods for soil and groundwater – selection and planning of remediation methods – some examples of in-situ remediation.

**Unit-V**

**Lecture hr.: 8**

**Advanced Soil Characterization**

Contaminant analysis - water content and permeability measurements – electrical and thermal property evaluation – use of GPR for site evaluation - introduction to geotechnical centrifuge modeling.

**4. TEXT BOOKS:**

1. Fang, H. – Introduction to Environmental Geotechnology.
2. Sharma, H. D. and Sangeeta, P.L. - waste containment systems, waste stabilization and landfills: design and evaluation.


**5. Reference Book**

3. Koerner, R. M. - Designing with geosynthetics

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 <b>Sushant</b> University Erstwhile Ansal University Gurugram	<b>School of Engineering &amp; Technology</b> <b>Course Outline B.Tech CE Specialization in Smart Cities</b>		
<b>Course Title: Environmental Impact Assessment</b> <b>0EA41E</b>		<b>Course Code: 15BCE-0EA41E</b>	
<b>Semester: VII</b>	<b>Academic Year: 2021-22</b>	<b>Core/Elective: Elective</b>	<b>Credits: 3</b>
<b>Course Designed by: Md Shadab Alam</b> <b>E-mail: Shadabalam@sushantuniversity.edu.in</b>		<b>Course Instructor: Md Shadab Alam</b> <b>E-mail: Shadabalam@sushantuniversity.edu.in</b>	
<b>Pre-requisites: Environment Engineering</b>			

### 1. Course Outcomes:

Upon successful completion of the course, the students should be able to:

1. Overview of assessing risks posing threats to the environment
2. Be able to access different case studies/examples of EIA in practice
3. Able to liaise with and the importance of stakeholders in the EIA process

### 2. CO and PO mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
<b>CO 1</b>	M		L		M		L	L		H		M		H	
<b>CO 2</b>		M	H	H		H		M			H	H		L	M
<b>CO 3</b>	M	H	H		M	M		H	M				H	M	M

### 3. Syllabus

**Total hr.-36**

#### Unit-I

**Lecture hr.: 6**

**Environmental impact assessment (EIA):** Introduction, definitions and concepts, rationale and historical development of EIA, EIA for civil engineers.

#### Unit-II

**Lecture hr.: 8**

**Broad components of EIA:** Environmental Impact Assessment planning. Activities, Methodology for Environmental Impact Assessment: ad-hoc method, maps and overlays, check

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lists, matrix, cause condition impacts. Role of Environmental Engineering firm, Role of Regulatory agencies & control boards, Role of the Public. Definition and scope, preliminary screening requiring EIA of projects. Impact identification, Assessment of Impact; Impact Evaluation. Types of EIA, rapid and comprehensive.

### Unit-III

**Lecture hr.: 6**

**Environmental Audit:** Introduction, Environmental information Purpose & advantage of studies, General approach of environmental Auditing Environmental Audit, Audit programs in India, Auditing program in major polluting Industries, Reports of the Environmental audit studies . Public involvement techniques, comprehensive environmental.

### Unit-IV

**Lecture hr.: 8**

**Pollution prevention and control laws & acts:** Constitution of India & environment, Constitution protection to Environment laws, Administrative & legislative arrangement for Environmental production, Indian Standards, Pollution control acts in India, critical appraisal, fiscal incentives for environmental protection.

### Unit-V

**Lecture hr.: 8**

**Environmental management: Principles, problems and strategies;**

Review of political, ecological and remedial actions. Future strategies; multidisciplinary environmental strategies, the human, planning, decision-making and management dimensions. Guidelines of preparation of project report and its evaluation, methods of clearance from the concern authorities at various labels.

#### **4. Text Books:**

1. L. W. Canter, Environmental Impact Assessment, 2nd Ed., McGraw-Hill, 1997.
2. Shukla, S.K. and Srivastava, P.R., "Concepts in Environmental Impact Analysis", Common Wealth Publishers, New Delhi, 1992.
3. NS Raman, "Environmental Impact Assessment"
4. "O P Gupta, "Elements of Environmental pollution & Control Khanna Publishing house.
5. A K Srivastava, Environment impact Assessment, APH Publishing, 2014


#### **5. REFERENCE BOOKS:**

1. L. W. Canter, Environmental Impact Assessment, 2nd Ed., McGraw-Hill, 1997.
2. P. Judith and G. Eduljee, Environmental Impact Assessment for Waste Treatment and Disposal Facilities, John Wiley & Sons, 1994.
3. G. Burke, B. R. Singh and L. Theodore, Handbook of Environmental Management and Technology, 2nd Ed., John Wiley & Sons, 2000.
4. C. H. Eccleston, Environment Impact Statements: A Comprehensive Guide to Project and Strategic Planning, John Wiley & Sons, 2000.
5. Ministry of Environment & Forests, Govt. of India 2006 EIA Notification

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		School of Engineering & Technology Course Outline	
Course Title: Organizational Behaviour 1OB21T		Course Code : 15BTC-	
Semester –Third	Academic Year: 2016-17	Core/Elective: Core	Credits: 3
Course Designed by: Dr. Tania Shaw e-mail: taniashaw@ansaluniversity.edu.in		Course Instructor: Dr. Tania Shaw e-mail: taniashaw@ansaluniversity.edu.in	
Pre-requisites: N/A			

### 1. Course Outcomes:

Upon successful completion of the course, the students should be able to:

**CO1:** Understand appropriate terminologies and practices regarding Human Resource Management.

**CO2:** Explain the fundamental concepts of Human Resource Management. Compare the different HR practices of various organizations.

**CO3:** Demonstrate proficiency in fundamental concepts of human resource management. Critically appraise the human resources practices of organizations.

### 2. Program Outcomes:

This section deals with how well this course meets the following eight overall program outcomes (POs):


**PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and engineering. Specialization to the solution of complex engineering problems.

**PO2. Problem analysis:** Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.

**PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations

**PO4. Conduct investigations of complex problems:** Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

  
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**PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

**PO10. Communication:** Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.

**PO11. Project management and finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

**PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**PSO1:** Apply standard Software Engineering practices and strategies in real-time software project development using open-source programming environment or commercial environment to deliver quality product for the organization success

**PSO2:** Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT and data analytics of varying complexity

**PSO3:** Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems

### 3. CO and PO mapping

CO & PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	L	L	M	L	H	H	M	M	H	H	H	M			
CO2	L	L	M	L	H	M	L	M	H	H	H	M			
CO3	L	L	M	L	H	M	M	M	H	H	H	M			

### 4. Syllabus:

Hrs.: 40

Total

#### UNIT I

#### FOCUS AND PURPOSE

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Definition, need and importance of organizational behaviour – Nature and scope – Framework – Organizational behaviour models.

## **UNIT II**

### **INDIVIDUAL BEHAVIOUR**

Personality – types – Factors influencing personality – Theories – Learning – Types of learners – The learning process – Learning theories – Organizational behaviour modification. Misbehaviour – Types – Management Intervention. Emotions - Emotional Labour – Emotional Intelligence – Theories. Attitudes – Characteristics – Components – Formation – Measurement- Values. Perceptions – Importance – Factors influencing perception – Interpersonal perception- Impression Management. Motivation – importance – Types – Effects on work behavior.

## **UNIT III**

### **GROUP BEHAVIOUR**

Organization structure – Formation – Groups in organizations – Influence – Group dynamics – Emergence of informal leaders and working norms – Group decision making techniques – Team building - Interpersonal relations – Communication – Control.

## **UNIT IV**

### **LEADERSHIP AND POWER**

Meaning – Importance – Leadership styles – Theories – Leaders Vs Managers – Sources of power – Power centers – Power and Politics.

## **UNIT V**

### **DYNAMICS OF ORGANIZATIONAL BEHAVIOUR**

Organizational culture and climate – Factors affecting organizational climate – Importance. Job satisfaction – Determinants – Measurements – Influence on behavior. Organizational change – Importance – Stability Vs Change – Proactive Vs Reaction change – the change process – Resistance to change – Managing change. Stress – Work Stressors – Prevention and Management of stress – Balancing work and Life. Organizational development – Characteristics – objectives –. Organizational effectiveness

## **5. TEXT BOOKS**

1. Stephen P. Robins, Organisational Behavior, PHI Learning / Pearson Education, 11<sup>th</sup> edition, 2008.
2. Fred Luthans, Organisational Behavior, McGraw Hill, 11<sup>th</sup> Edition, 2001.

## **6. REFERENCES**

1. Schermerhorn, Hunt and Osborn, Organisational behavior, John Wiley, 9<sup>th</sup> Edition, 2008.
2. Udai Pareek, Understanding Organisational Behaviour, 2<sup>nd</sup> Edition, Oxford Higher Education, 2004
3. Mc Shane & Von Glinov, Organisational Behaviour, 4<sup>th</sup> Edition, Tata Mc Graw Hill, 2007.
4. Hellrigel, Slocum and Woodman, Organisational Behavior, Cengage Learning, 11<sup>th</sup> Edition 2007.
5. Ivancevich, Konopaske & Maheson, Organisational Behaviour & Management, 7<sup>th</sup> edition, Tata McGraw Hill, 2008.

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## 7. Evaluation Scheme

Exam Type	Marks Breakup
Mid Semester Examination	15
End Semester Examination	60
Quiz	10
Assignment	10
Faculty Assessment	5

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		School of Engineering & Technology	
<b>Course Title: Technical Communication</b>			
<b>Course Code: 16BTC-1TC11T</b>			
<b>Semester: I</b>	<b>Academic Year: 2016-17</b>	<b>Core/Elective: Core</b>	<b>Credits: 3</b>
<b>Course Designed by: Amit Singh Tomar</b> <b>E-mail: amittomar@ansaluniversity.edu.in</b>		<b>Course Instructor:</b> <b>E-mail:</b>	
<b>Pre-requisites: NA</b>			

### 1. Course Outcomes:

Upon successful completion of the course, the students should be able to:

**CO1:** Students will be enabled to understand the nature and objective of Technical Communication relevant for the work place as Engineers.

**CO2:** Students will utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.

**CO3:** It would enable them to evaluate their efficacy as fluent & efficient communicators by learning the voice-dynamics.

### 2. Program Outcomes:

This section deals with how well this course meets the following twelve overall program outcomes (POs):

**PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and engineering. Specialization to the solution of complex engineering problems.

**PO2. Problem analysis:** Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.

**PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO4. Conduct investigations of complex problems:** Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and modeling to complex engineering activities with an understanding of the limitations.

**PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

**PO10. Communication:** Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.

**PO11. Project management and finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

**PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**PSO-1: Professional Skills:** To demonstrate basic understanding of engineering fundamentals, professional/social ethics and apply mathematical foundations to solve mechanical problems.

**PSO-2: Problem Solving Skills:** An ability to apply Mechanical Engineering principle to innovate engineering design and implementation of skills to provide optimal solutions for complex problems and provide the platform for research in emerging areas.

**PSO-3: Successful Career and Entrepreneurship:** Demonstrate ability to communicate effectively with a range of audiences to analyze the local and global impact of mechanical on individual, organization and society with an aim for holistic professional development and optimizing resources as a successful Entrepreneur.

### 3. CO and PO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	H	M	M	M	L	L	L	L	L	H	M	M	L	L	L
CO2	H	H	M	M	L	H	L	L	L	L	M	L	M	L	L
CO3	H	M	H	L	M	M	M	M	L	L	M	M	M	M	M

### 4. Syllabus:

**Total Hrs.: 40**

#### Unit-1

**Lecture Hr.: 06**

#### Fundamentals of Technical Communication:

Technical Communication: Features; Distinction between General and Technical Communication; Language as a tool of Communication; Dimensions of Communication: Reading & comprehension; Technical writing: sentences; Paragraph; Technical style: Definition,



types & Methods; The flow of Communication: Downward; upward, Lateral or Horizontal; Barriers to Communication.

## **Unit-2**

**Lecture Hr.: 06**

### **Forms of Technical Communication:**

Technical Report: Definition & importance; Thesis/Project writing: structure & importance; synopsis writing: Methods; Technical research Paper writing: Methods & style; Seminar & Conference paper writing; Key-Note Speech: Introduction & Summarization; Expert Technical Lecture: Theme clarity; Analysis & Findings; 7 Cs of effective business writing: concreteness, completeness, clarity, conciseness, courtesy, correctness, consideration.

## **Unit-3**

**Lecture Hr.: 08**

### **Technical Presentation: Strategies & Techniques**

Presentation: Forms; interpersonal Communication; Class room presentation; style; method; Individual conferencing: essentials: Public Speaking: method; Techniques: Clarity of substance; emotion; Humour; Modes of Presentation; Overcoming Stage Fear: Confident speaking; Audience Analysis & retention of audience interest; Methods of Presentation: Interpersonal; Impersonal; Audience Participation: Quizzes & Interjections.

## **Unit-4**

**Lecture Hr.: 10**

### **Technical Communication Skills:**

Interview skills; Group Discussion: Objective & Method; Seminar/Conferences Presentation skills: Focus; Content; Style; Argumentation skills: Devices: Analysis; Cohesion & Emphasis; Critical thinking; Nuances: Exposition narration & Description; effective business communication competence: Grammatical; Discourse competence: combination of expression & conclusion; Socio-linguistic competence: Strategic competence: Solution of communication problems with verbal and non-verbal means.

## **Unit-5**

**Lecture Hr.: 10**

### **Kinesics & Voice Dynamics:**

Kinesics: Definitions; importance; Features of Body Language; Voice Modulation: Quality, Pitch; Rhythm; intonation; Pronunciation; Articulation; stress & accent; Linguistic features of voice control: Vowel & Consonant Sounds.

### **5. Text Book(s):**

- T1. Technical Communication – Principles and Practices by Meenakshi Raman & Sangeeta Sharma, Oxford Univ. Press, 2007, New Delhi.
- T2. Practical Communication: Process and Practice by L.U.B. Pandey; A.I.T.B.S. Publications India Ltd.; Krishan Nagar, 2014, Delhi.

### **6. Reference Book(s):**

- R1. A Text Book of Scientific and Technical Writing by S.D. Sharma; Vikas Publication, Delhi.
- R2. Skills for Effective Business Communication by Michael Murphy, Harvard University, U.S.

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## 7. Evaluation Scheme

Exam Type	Marks Breakup
Mid Semester Examination	15
End Semester Examination	60
Quiz	10
Assignment	10
Faculty Assessment	5

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**Course Outline**

**Course Title: UNIVERSAL HUMAN VALUES**

**Course Code: SE-151**

<b>Program: B. Tech / BCA</b> <b>Semester: 1st</b>	<b>Academic</b> <b>2023-24</b>	<b>Year:</b>	<b>Core/Elective: Core</b>	<b>Credits: 2</b>		
				<b>L</b> <b>2</b>	<b>T</b> <b>0</b>	<b>P</b> <b>0</b>
<b>Course Designed by: Rajan Bansal</b> <b>E-mail: rajanbansal@sushantuniversity.edu.in</b> <b>Pre-requisites: None</b>			<b>Course Instructor: Rajan Bansal</b> <b>E-mail: rajanbansal@sushantuniversity.edu.in</b>			

**1. Course Outcomes:**

Upon successful completion of the course, the students should be able to:

- CO1:** Distinguish between values and skills, and understand the need, basic guidelines, content and process of value education.
- CO2:** Initiate a process of dialog within themselves to know what they really want to be in their life and profession.
- CO3:** Understand the meaning of happiness and prosperity for a human being.
- CO4:** Understand harmony at all the levels of human living, and live accordingly.
- CO5:** Facilitate in applying the understanding of harmony in existence in their profession and lead an ethical life.

**2. Program Outcomes:**

This section deals with how well this course meets the following eight overall program outcomes (POs):

- PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and engineering. Specialization to the solution of complex engineering problems.
- PO2. Problem analysis:** Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.
- PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4. Conduct investigations of complex problems:** Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and modeling to complex engineering activities with an understanding of the limitations.
- PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.



**PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

**PO10. Communication:** Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.

**PO11. Project management and finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

**PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### Program Specific Outcomes (PSOs)

#### PSO 1: Professional Skills

To demonstrate basic understanding of engineering fundamentals, professional/social ethics and apply mathematical foundations to solve mechanical problems.

#### PSO 2: Problem Solving Skills

An ability to apply Mechanical Engineering principle to innovate engineering design and implementation of skills to provide optimal solutions for complex problems and provide the platform for research in emerging areas.

#### PSO 3: Successful Career and Entrepreneurship

Demonstrate ability to communicate effectively with a range of audiences to analyze the local and global impact of mechanical on individual, organization and society with an aim for holistic professional development and optimizing resources as a successful Entrepreneur.

### 3. CO and PO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1							M	H		M		H			
CO2							M	H		M		H			
CO3							L	H		H		H			
CO4							M	H		M		H			
CO5							H	H		H		H			

### 4. Syllabus:

Total hr.-28

#### Unit-I: Introduction to Value Education

1. Value Education, Definition, Concept and Need for Value Education
2. The Content and Process of Value Education
3. Self-Exploration as a means of Value Education
4. Happiness and Prosperity as parts of Value Education

#### Unit-II: Harmony in the Human Being

1. Human Being is more than just the Body

2. Harmony of the Self („I“) with the Body
3. Understanding Myself as Co-existence of the Self and the Body
4. Understanding Needs of the Self and the Needs of the Body

### **Unit-III: Harmony in the Family and Society and Harmony in the Nature**

1. Family as a basic unit of Human Interaction and Values in Relationships
2. The Basics for respect and today's Crisis: Affection, Care, Guidance, Reverence, Glory, Gratitude and Love
3. Comprehensive Human Goal: The Five dimensions of Human Endeavour

### **Unit-IV: Social Ethics**

1. The Basics for Ethical Human conduct
2. Defects in Ethical Human Conduct
3. Holistic Alternative and Universal order
4. Universal Human Order and Ethical Conduct

### **Unit-V: Professional Ethics**

1. Value Based Life and Profession
2. Professional Ethics and Right Understanding
3. Competence in Professional Ethics
4. Issues in Professional Ethics – The Current scenario
5. Vision for Holistic Technologies, Production System and Management Models

### **5. Text Book(s):**

The text book R.R Gaur, R Sangal, G P Bagaria, "A foundation Course in Human Values and professional Ethics, Excel books, New Delhi, 2010, ISBN 978-8-174-46781-2

### **6. Reference Book(s):**


- i. A.N. Tripathy, 2003, Human Values, New Age International Publishers Power plant technology: By E.I. Wakil TMH
- ii. R.R Gaur, R Sangal, G P Bagaria, "A foundation Course in Human Values and professional Ethics – Teachers Manual", Excel books, New Delhi, 2010
- iii. P.L. Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Publishers.
- iv. Bertrand Russell Human Society in Ethics & Politics
- v. Gaur. R. R., Sangal. R, Bagaria. G.P, A Foundation Course in Value Education, Excel Books, 2009.

### **7. Evaluation Scheme**

Exam Type	Marks Breakup
Mid Semester Examination	15
End Semester Examination	60
Quiz / Presentation	15
Assignment	10

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		School of Engineering & Technology	
<b>Course Title: Professional Ethics in Engineering</b> <b>Course Code: 15BTC-1PE12T</b>			
<b>Semester: II</b>	<b>Academic Year: 2019-20</b>	<b>Core/Elective: Core</b>	<b>Credits: 3</b>
<b>Course Designed by: Amit Singh Tomar</b> <b>E-mail: amittomar@ansaluniversity.edu.in</b>		<b>Course Instructor: Amit Singh Tomar</b> <b>E-mail: amittomar@ansaluniversity.edu.in</b>	
<b>Pre-requisites: NA</b>			

### 1. Course Outcomes:

Upon successful completion of the course, the students should be able to:

**CO1:** To enable the students to create an awareness on Engineering Ethics and Human Values.

**CO2:** To instill Moral and Social Values and Loyalty and to appreciate the rights of others.

### 2. Program Outcomes:

This section deals with how well this course meets the following twelve overall program outcomes (POs):

**PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and engineering. Specialization to the solution of complex engineering problems.

**PO2. Problem analysis:** Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.

**PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO4. Conduct investigations of complex problems:** Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and modeling to complex engineering activities with an understanding of the limitations.

**PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

**PO10. Communication:** Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.

**PO11. Project management and finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

**PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**PSO-1: Professional Skills:** To demonstrate basic understanding of engineering fundamentals, professional/social ethics and apply mathematical foundations to solve mechanical problems.

**PSO-2: Problem Solving Skills:** An ability to apply Mechanical Engineering principle to innovate engineering design and implementation of skills to provide optimal solutions for complex problems and provide the platform for research in emerging areas.

**PSO-3: Successful Career and Entrepreneurship:** Demonstrate ability to communicate effectively with a range of audiences to analyze the local and global impact of mechanical on individual, organization and society with an aim for holistic professional development and optimizing resources as a successful Entrepreneur.

### 3. CO and PO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	H	L	L	M	L	L	H	L	H	H	H	M	L	L	L
CO2	M	L	L	L	M	H	M	M	M	M	M	M	L	L	L

### 4. Syllabus:

**Total Hrs.: 40**

#### Unit-1

**Lecture Hr.: 06**

Morals, values and Ethics, Integrity, Work ethic, Service learning, Civic virtue, Respect for others, living peacefully, Caring, Sharing, Honesty, Courage, Valuing time, Cooperation, Commitment Empathy Self-confidence, Character, Spirituality, Introduction to Yoga and meditation for professional excellence and stress management.

#### Unit-2

**Lecture Hr.: 06**

Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Models of professional roles - Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories

#### Unit-3

**Lecture Hr.: 08**

Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law.

**Unit-4****Lecture Hr.: 10**

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk - Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination

**Unit-5****Lecture Hr.: 10**

Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership – Code of Conduct – Corporate Social Responsibility

**5. Text Book(s):**

- T1. Mike W. Martin and Roland Schinzinger, "Ethics in Engineering", Tata McGraw Hill, New Delhi, 2003. 2. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.


**6. Reference Book(s):**

- R1. Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, "Engineering Ethics –Concepts and Cases", Cengage Learning, 2009
- R2. Charles B. Fleddermann, "Engineering Ethics", Pearson Prentice Hall, New Jersey, 2004.
- R3. Laura P. Hartman and Joe Desjardins, "Business Ethics: Decision Making for Personal Integrity and Social Responsibility" Mc Graw Hill education, India Pvt. Ltd., New Delhi 2013.
- R4. World Community Service Centre, " Value Education", Vethathiri publications, Erode, 2011

**7. Evaluation Scheme**

Exam Type	Marks Breakup
Mid Semester Examination	15
End Semester Examination	60
Quiz	10
Assignment	10
Faculty Assessment	5



		School of Engineering & Technology		
<b>Course Title: Technical Communication</b> <b>Course Code: 19BTC-1TC21L</b>				
<b>Semester: III</b>	<b>Academic 2020-21</b>	<b>Year:</b>	<b>Core/Elective: Core</b>	<b>Credits: 3</b>
<b>Course Designed by: Amit Singh Tomar</b> <b>E-mail: amittomar@ansaluniversity.edu.in</b>			<b>Course Instructor: Mr. Rajan Bansal</b> <b>E-mail: rajanbansal@ansaluniversity.edu.in</b>	
<b>Pre-requisites: NA</b>				

### 1. Course Outcomes:

Upon successful completion of the course, the students should be able to:

- CO1:** Students will be enabled to understand the nature and objective of Technical Communication relevant for the work place as Engineers.
- CO2:** Students will utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.
- CO3:** It would enable them to evaluate their efficacy as fluent & efficient communicators by learning the voice-dynamics.

### 2. Program Outcomes:

This section deals with how well this course meets the following twelve overall program outcomes (POs):

- PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and engineering. Specialization to the solution of complex engineering problems.
- PO2. Problem analysis:** Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.
- PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4. Conduct investigations of complex problems:** Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and modeling to complex engineering activities with an understanding of the limitations.
- PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

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**PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

**PO10. Communication:** Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.

**PO11. Project management and finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

**PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**PSO-1: Professional Skills:** To demonstrate basic understanding of engineering fundamentals, professional/social ethics and apply mathematical foundations to solve mechanical problems.

**PSO-2: Problem Solving Skills:** An ability to apply Mechanical Engineering principle to innovate engineering design and implementation of skills to provide optimal solutions for complex problems and provide the platform for research in emerging areas.

**PSO-3: Successful Career and Entrepreneurship:** Demonstrate ability to communicate effectively with a range of audiences to analyze the local and global impact of mechanical on individual, organization and society with an aim for holistic professional development and optimizing resources as a successful Entrepreneur.

### 3. CO and PO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	H	M	M	M	L	L	L	L	L	H	M	M	L	L	L
CO2	H	H	M	M	L	H	L	L	L	L	M	L	M	L	L
CO3	H	M	H	L	M	M	M	M	L	L	M	M	M	M	M

### 4. Syllabus:

**Total Hrs.: 40**

#### Unit-1

**Lecture Hr.: 06**

#### Fundamentals of Technical Communication:

Technical Communication: Features; Distinction between General and Technical Communication; Language as a tool of Communication; Dimensions of Communication: Reading & comprehension; Technical writing: sentences; Paragraph; Technical style: Definition, types & Methods; The flow of Communication: Downward; upward, Lateral or Horizontal; Barriers to Communication.

#### Unit-2

**Lecture Hr.: 06**

#### Forms of Technical Communication:



Technical Report: Definition & importance; Thesis/Project writing: structure & importance; synopsis writing: Methods; Technical research Paper writing: Methods & style; Seminar & Conference paper writing; Key-Note Speech: Introduction & Summarization; Expert Technical Lecture: Theme clarity; Analysis & Findings; 7 Cs of effective business writing: concreteness, completeness, clarity, conciseness, courtesy, correctness, consideration.

### Unit-3

Lecture Hr.: 08

#### Technical Presentation: Strategies & Techniques

Presentation: Forms; interpersonal Communication; Class room presentation; style; method; Individual conferencing: essentials: Public Speaking: method; Techniques: Clarity of substance; emotion; Humour; Modes of Presentation; Overcoming Stage Fear: Confident speaking; Audience Analysis & retention of audience interest; Methods of Presentation: Interpersonal; Impersonal; Audience Participation: Quizzes & Interjections.

### Unit-4

Lecture Hr.: 10

#### Technical Communication Skills:

Interview skills; Group Discussion: Objective & Method; Seminar/Conferences Presentation skills: Focus; Content; Style; Argumentation skills: Devices: Analysis; Cohesion & Emphasis; Critical thinking; Nuances: Exposition narration & Description; effective business communication competence: Grammatical; Discourse competence: combination of expression & conclusion; Socio-linguistic competence: Strategic competence: Solution of communication problems with verbal and non-verbal means.

### Unit-5

Lecture Hr.: 10

#### Kinesics & Voice Dynamics:

Kinesics: Definitions; importance; Features of Body Language; Voice Modulation: Quality, Pitch; Rhythm; intonation; Pronunciation; Articulation; stress & accent; Linguistic features of voice control: Vowel & Consonant Sounds.

#### 5. Text Book(s):

- T1. Technical Communication – Principles and Practices by Meenakshi Raman & Sangeeta Sharma, Oxford Univ. Press, 2007, New Delhi.
- T2. Practical Communication: Process and Practice by L.U.B. Pandey; A.I.T.B.S. Publications India Ltd.; Krishan Nagar, 2014, Delhi.

#### 6. Reference Book(s):


- R1. A Text Book of Scientific and Technical Writing by S.D. Sharma; Vikas Publication, Delhi.
- R2. Skills for Effective Business Communication by Michael Murphy, Harward University, U.S.

#### 7. Evaluation Scheme

Exam Type	Marks Breakup
Mid Semester Examination	15
End Semester Examination	60
Quiz	10
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Faculty Assessment	5

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 <b>Sushant University</b> Bestwhile Ansal University Gurugram		<b>School of Engineering &amp; Technology</b> <b>Course Outline</b>	
<b>Course Title: Managerial Economics</b>		<b>Course Code: 20BTC-1ME31T</b>	
<b>Semester: V</b>	<b>Academic Year: 2021-2022</b>	<b>Core/Elective: Core</b>	<b>Credits: 2</b>
<b>Course Designed by: Dr.Nidhi Chowdhary</b> <b>E-mail: nidhichowdhary@sushantuniversity.edu.in</b>		<b>Course Instructor: Dr.Nidhi Chowdhary</b> <b>E-mail: nidhichowdhary@sushantuniversity.edu.in</b>	
<b>Pre-requisites: Fundamental concept of Integral and Differential calculus, Differential equations.</b>			

### 1. Course Outcomes

Upon the completion, students should be able to:

CO1: Through the course, the students will get a basics perspective of economics.

CO2: They will understand the importance of Managerial economics for business decision making.

CO3: They will get an insight into the changes of government policy, money supply and its impact on business decision making.

CO4: This course will also introduce various kinds of markets and understand their features.

CO5: The students will learn about the business decision making in terms of demand forecasting, pricing decision and breakeven point etc.

### 2. Programme Educational Objectives (PEOs)


PEO-1 Graduates will apply the knowledge of Computer Science Engineering to solve real world Engineering problems.

PEO-2 To prepare graduates with an outstanding knowledge of engineering, technology and its applied streams along with the management, humanities and various other interdisciplinary subjects for a successful career.

PEO-3 Enable graduates to acquire knowledge of relevant Technologies and multidisplinary fields including broad social, ethical and environmental issues within which the engineering is practiced.

PEO-4 To create awareness and understanding within the graduates related to societal issues, apart from developing a sense of commitment to the community and profession with sincere.

### 3. Programme Outcomes (POs)

  
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On successful completion of the program, the Computer Science and Engineering Graduates are expected to:

- PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and engineering. Specialization to the solution of complex engineering problems.
- PO2. Problem analysis: Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.
- PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4. Conduct investigations of complex problems: Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and modelling to complex engineering activities with an understanding of the limitations.
- PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9. Individual and team work: Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.
- PO10. Communication: Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.
- PO11. Project management and finance: Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.
- PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

#### 4. Programme Specific Outcomes (PSO's)

On completion of the B.Tech (Computer Science and Engineering) degree the graduates will be able to

- PSO1: Apply standard Software Engineering practices and strategies in real-time software project development using open-source programming environment or commercial environment to deliver quality product for the organization success

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PSO2: Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT and data analytics of varying complexity

PSO3: Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems

### 5. CO and PO mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO 1	H												M		
CO 2	H	M	M	M	M								M		
CO 3	M		M												L
CO 4	H														L
CO 5	M	M													

### 6. Course Contents

#### Unit I

Basics concept of economics: Introduction to economics, basic economics problem, circular flow of economics activity, nature of the firm –rationale, objectives of maximizing firm value as present value and Marginal and Incremental Analysis, meaning and importance of managerial economics, scope of managerial economics, importance of the study of managerial economics, Basic Calculus: The Calculus of Optimization.

#### Unit II

Demand Analysis and Forecasting: Demand and Supply, Market Equilibrium, Comparative Statics: Changes in Demand and Supply, determinants of market demand at firm and industry level, elasticity of demand, The Production Function, Profit-Maximizing, Cost Minimization and Breakeven analysis, Stages of Production and Law of Variable Proportions. Long run and Short run. Economies and diseconomies of scale

#### Unit III

Features of various markets Perfect competition, Monopoly, monopolistic competition, oligopoly, Macro Economics: Definition of Money, Money -Functions and Forms, Measures of Money Supply - M1, M2, M3 and M4, Role and Function of RBI, Role and function of Commercial Banks, Money and Capital market in India: role and function of money market and capital market

#### Unit IV

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Monetary Policy- Concept, Objectives, Instruments - CRR, SLR, OMO, Bank Rate, Repo Rate, Reverse Repo Rate etc, Fiscal Policy - Concept, Objectives. National Income: Concepts- GDP, NDP, Net factor income from abroad, Net Indirect taxes, market prices, factor cost etc. Definitions. Methods of Measurement of National Income – Output Method, Income Method and Expenditure method. Questions for Revision.

## 7. Text Books

- Vanita A, (2013). *Managerial Economics*, (1sted). Pearson, India.
- Dornbusch, Fisher, & Startz: *Macroeconomics*, Tata McGraw Hill, 10e
- Dwivedi, D.N; *Managerial Economics*, Vikas Publishing House, 8e
- Agarwal, Vanita, (2010) *Macroeconomics Theory and Policy*, Pearson Education. 1e
- Mishra, S. K. and Puri, V. K., *Modern Macroeconomics Theory*, Himalaya Publishing House.
- Shapiro, E., *Macroeconomics Analysis*, McGraw Hill Education, 5e

## 8. Reference Material:

- Economics Times
- Mint
- Special Reports, Daily News, Finance and Economics and Business
- Law of demand - <https://www.youtube.com/watch?v=QvGLcCTXk9o>
- Exceptions to Law of Demand - [https://www.youtube.com/watch?v=e\\_Zty4HCA-Q](https://www.youtube.com/watch?v=e_Zty4HCA-Q)
- Substitutes and Complements - <https://www.youtube.com/watch?v=UixiclRFuYI>

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Sushant University  
Sector-55, Gurugram



**Course Outline**

**Course Title: Entrepreneurship**

**Course Code: 21BTC-1EE21C**

**Semester: 3<sup>rd</sup>**

**Academic  
2022-23**

**Year:**

**Core/Elective: Core**

**Credits: 3**

L	T	P
3	0	0

**Course Designed by: Rajan Bansal**

**E-mail: rajanbansal@sushantuniversity.edu.in**

**Course Instructor: Rajan Bansal**

**E-mail: rajanbansal@sushantuniversity.edu.in**

**Pre-requisites: None**

**1. Course Outcomes:**

Upon successful completion of the course, the student will gain:

CO1: An expansive and deep appreciation of entrepreneurship, and its pivotal role in the economy.

CO2: An approach entrepreneurship with clarity and focus, and an enhanced understanding of the key success factors as well as possible risks and potential mitigation strategies.

CO3: Knowledge to navigate the opportunities and challenges of entrepreneurship more effectively with the additional insights available.

**2. Program Outcomes:**

This section deals with how well this course meets the following eight overall program outcomes (POs):

**PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and engineering. Specialization to the solution of complex engineering problems.

**PO2. Problem analysis:** Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.

**PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO4. Conduct investigations of complex problems:** Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

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**PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and modeling to complex engineering activities with an understanding of the limitations.

**PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

**PO10. Communication:** Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.

**PO11. Project management and finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

**PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### 3. CO and PO mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO 1	L						H	H							L
CO 2							H	H		L					L
CO 3				L			H	H	L	M	L				L

### 4. Course Content

The course structure and content covers, over a period of 12 weeks, the following 15 modules.

#### Module 1: Entrepreneurial Journey

Outlines the various stages of setting up and growing an entrepreneurial firm –from start-up to ramp-up; covers key definitional aspects

**Module 2: Entrepreneurial Discovery**

Focusses on self-discovery and self-evaluation; proposes a model of entrepreneurship that could be contextually adaptive while being person-specific

**Module 3: Ideation and Prototyping**

Discusses the importance and methodologies of developing ideas and prototypes to establish workable propositions

**Module 4: Testing, Validation and Commercialization**

Covers the concepts of Minimum Viable Product and Ultimate Desirable Product; focusses on thematic criticality

**Module 5: Disruption as a Success Driver**

Discusses the importance of disrupting established product and service structures as well as processes to create new growth niches

**Module 6: Technological Innovation and Entrepreneurship – 1**

Focusses on technology as a key driver of successful start-up and sustainable ramp-up – provides examples

**Module 7: Technological Innovation and Entrepreneurship – 2**

Takes a further deep-dive on technology as a key driver of successful start-up and sustainable ramp-up –provides additional examples

**Module 8: Raising Financial Resources**

Outlines options available for entrepreneurs to access funds, the policy frameworks, and other supportive options

**Module 9: Education and Entrepreneurship**

Discusses how an individual's education can be leveraged for setting up entrepreneurial and start-up firms

**Module 10: Beyond Founders and Founder-Families**

Discusses the need for professionalization of start-ups at the appropriate time of development and growth, and the challenges involved in leadership transitions with solutions.

**Module 11: India as a Start-up Nation**

Presents and analyses India's position in global entrepreneurship rankings, and discusses ways and measures for India to rediscover and reinforce the entrepreneurial DNA

**Module 12: National Entrepreneurial Culture**

Proposes a framework for converting Start-up India and Make in India from Missions to Results, developing strong entrepreneurial culture

**Module 13: Entrepreneurial Thermodynamics**

Presents an off-beat technical view of interpreting entrepreneurial passion and energy in terms of the principles of thermodynamics

**Module 14: Entrepreneurship and Employment**

Discusses the importance of, and processes for, leveraging entrepreneurship for generating employment in the economy

**Module 15: Start-up Case Studies**

Presents 12 case studies of entrepreneurial firms; these comprise (i) ventures which have grown in combination with established businesses, (ii) start-ups that were founded based on core competencies of founders to deliver potentially disruptive products and services, and (iii) socially



oriented offbeat ventures in educational, social and healthcare sectors –essentially based on networking and people skills

## 5. Books and references


1. Zero to One: Notes on Startups, or How the Build the Future by Peter Thiel
2. The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses by Eric Ries
3. India as Global Start-up Hub: Mission with Passion by C B Rao
4. Elon Musk: Tesla, SpaceX, and the Quest for a Fantastic Future by Ashlee Vance
5. Steve Jobs by Walter Isaacson
6. Innovation and Entrepreneurship: Practice and Principles by Peter F Drucker
7. The Innovator's Solution: Creating and Sustaining Successful Growth by Clayton M Christensen

## 6. Evaluation Scheme

Exam Type	Marks Breakup
Mid Semester Examination	15
End Semester Examination	60
Quiz	10
Assignment	10
Faculty Assessment	5

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		School of Engineering & Technology Course Outline	
Course Title: Seven Habits of Highly Effective People Course Code: 22SET-VA01			
Semester: II		Academic Year: 2022-23	Credits: 0
Course Designed by: Dr. Sudipto Sarkar E-mail: sudiptosarkar@sushantuniversity.edu.in		Course Instructor: Dr. Sudipto Sarkar E-mail:sudiptosarkar@sushantuniversity.edu.in	
Pre-requisites: None			

### 1. Course Outcome:

Upon successful completion of the course, the students should be able to

CO1: become proactive in their personal and professional life.

CO2: Understand the importance of thinking about the end result before starting any task.

CO3: Appreciate the value of collaboration to maximize the success rate.

CO4: Apply their knowledge in effective communication with others.

CO5: Lead a great life full of belief in their abilities.

### 2. CO and PO mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO 1								H	M	M	L	H			
CO 2								H	M	M	M	H			
CO 3						H		H	H	M	H	H			
CO 4						H	M	H	H	H	H	H			
CO 5						H	M	H	H	H	H	H			

### 3. Syllabus:


**Total Hrs.: 30**

#### UNIT I-

**Total: 6 hours**

The Power of Paradigm and its shifting, Overview and Insight into 7 Habits of Highly Effective People, Effective Habits, The Maturity Continuum, Private Victory.

Habit 1: Be Proactive – Principles, Proactive and Reactive focus, Expanding the circle of

  
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influence, Making and keeping commitments.

**UNIT II –**

Total: 6 hours

Habit 2: Begin with the End in Mind – Principles of personal leadership, being your own first creator, personal mission statement, identifying your Centre, understanding security, guidance, wisdom and power, Tapping your right brain, identifying roles and goals, creating family and organization mission

**UNIT III -**

Total: 6 hours

Habit 3 – Put first things first: Principle of personal management, four quadrants of time management, moving from one to the next quadrant.

Public Victory rules- Paradigm of interdependence.

Habit 4 – Think Win/ Win: Principles of interpersonal leadership, Six paradigm of human interaction, character, relationship and agreement; Win- win management training.

**UNIT IV-**

Total: 6 hours

Habit 5 – Seek first to understand, then to be understood: principle for emphatic communication, diagnose before you prescribe, understanding and perception, one on one.

Habit 6 – Synergize: Principles of creative cooperation, synergy and communication, negative synergy, valuing the differences, all nature is synergistic.

**UNIT V-**

Total: 6 hours

Habit 7 – Sharpen the Saw: Principles of balancing self-renewal, the spiritual-mental-social dimensions, synergy in renewal, the upward spiral.

Inside-out of the entire habits – intergenerational living, becoming a transition person.

**4. Textbook(s):**

- T1. Stephen R Covey, “7 habits of Highly Effective People”, Publisher: Free Press, 1989
- T2. James Clear, “Atomic Habits”. Penguin Random House, 2018

**5. Reference Book(s):**

- R1: Charles Duhigg, “The Power of Habit: Why We Do What We Do in Life and Business”, Random House Publishing Books, 2014
- R2: Zig Ziglar, “See You at the Top”, Published by Pelican Pub Co Inc, 1984.

**6. Programme Educational Objectives (PEOs)**

PEO-1 Graduates will apply the knowledge of Computer Science Engineering to solve real world Engineering problems.

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**Course Title: Elements of Management**  
**Course Code: 18BTCCS-0EM31T**
**Semester: V**
**Academic Year: 2020-21**
**Core/Elective:**  
**Core**
**Credits: 3**
**Course Designed by: Rajan Bansal**  
**E-mail: [rajanbansal@ansaluniversity.edu.in](mailto:rajanbansal@ansaluniversity.edu.in)**
**Course Instructor: Rajan Bansal**  
**E-mail: [rajanbansal@ansaluniversity.edu.in](mailto:rajanbansal@ansaluniversity.edu.in)**
**Pre-requisites: None**
**1. Course Outcomes:**

Upon successful completion of the course, the students should be able to:

- CO1** study the evolution of management, functions and principles of management, roles and skills of a manager
- CO2** know the meaning, elements and importance of Planning and decision making.
- CO3** know the meaning, advantages and limitations of organizing. Delegation of authority.
- CO4** understand the meanings and processes of directing, coordinating and Leadership.

**2. Program Outcomes:**

This section deals with how well this course meets the following twelve overall program outcomes (POs):

- PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and engineering. Specialization to the solution of complex engineering problems.
- PO2. Problem analysis:** Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.
- PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4. Conduct investigations of complex problems:** Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and modeling to complex engineering activities with an understanding of the limitations.
- PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

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**PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

**PO10. Communication:** Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.

**PO11. Project management and finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

**PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### Program Specific Outcomes (PSOs)

**PSO-1: Professional Skills:** To demonstrate basic understanding of engineering fundamentals, professional/social ethics and apply mathematical foundations to solve mechanical problems.

**PSO-2: Problem Solving Skills:** An ability to apply Mechanical Engineering principle to innovate engineering design and implementation of skills to provide optimal solutions for complex problems and provide the platform for research in emerging areas.

**PSO-3: Successful Career and Entrepreneurship:** Demonstrate ability to communicate effectively with a range of audiences to analyze the local and global impact of mechanical on individual, organization and society with an aim for holistic professional development and optimizing resources as a successful Entrepreneur.

### 3. CO and PO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	H		L	M			H	M	L	M	L	H		M	H
CO2		M		M	L		M	M		M	H	H			H
CO3	M		M				L	L		M	M	H			H
CO4		L		H	M			H			M	H			H

### 4. Syllabus:

#### UNIT I

#### Nature of Management:

Management: Concept, Significance, Role & Skills, Levels of Management, Concepts of PODSCORB, Managerial Grid. Evolution of Management thoughts, Contribution of F.W Taylor, Henri Fayol and Contingency Approach.

Total Hrs.: 24

8 Hrs



## UNIT II

### Planning and Decision Making

6 Hrs

Planning: Meaning, Importance, Elements, Process, Limitations and MBO.

Decision Making: Meaning, Importance, Process, Techniques of Decision Making.

## UNIT III

### Organizing

4 Hrs

Organizing: Concepts, Structure (Formal & Informal, Line & Staff and Matrix), Meaning, Advantages and Limitations

Departmentation: Meaning, Basis and Significance

Span of Control: Meaning, Graicunas Theory, Factors affecting span of Control Centralization vs Decentralization

Delegation: Authority & Responsibility relationship

## UNIT IV

### Directing, Leadership, Co-ordination and Controlling:

6 Hrs

Directing: Meaning and Process

Leadership: Meaning, Styles and Qualities of Good Leader

Co-ordination as an Essence of Management

Controlling: Meaning, Process and Techniques

Recent Trends: Green Management & CSR

### 5. Text Book(s):

- Principles of Management, Ramasamy, Himalya Publication, Mumbai
- Principles of Management, Tripathi Reddy, Tata Mc Grew Hill
- Management Text & Cases, VSP Rao, Excel Books, Delhi

### 6. Reference Book(s):


- Management Concepts and OB, P S Rao & N V Shah, Ajab Pustakalaya
- Essentials of Management, Koontz II & W, Mc. Grew Hill, New York
- Principles of Management-Text and Cases –Dr. M. Sakthivel Murugan, New Age Publications

### E-resources:

1. <http://inventors.about.com/od/entrepreneur/>
2. <http://learnthat.com/tag/entrepreneurship/>
3. [www.managementstudyguide.com](http://www.managementstudyguide.com)

### 7. Evaluation Scheme

Exam Type	Marks Breakup
Mid Semester Examination	15
End Semester Examination	60
Quiz	10
Assignment/ Faculty Assessment	15

		School of Engineering & Technology	
Course Outline			
Course Title: Entrepreneurship Development			
Course Code: 23BCS-0ED41E			
Semester: III	Academic Year: 2023-2024	Core/Elective: Core	Credits: 1
Course Designed by: Dr. Alpana Jijja E-mail: <a href="mailto:alpanajijja@sushantuniversity.edu.in">alpanajijja@sushantuniversity.edu.in</a>		Course Instructor: Dr. Neha Gupta E-mail: <a href="mailto:nehagupta@sushantuniversity.edu.in">nehagupta@sushantuniversity.edu.in</a>	
Pre-requisites: Knowledge of Managerial Economics			

### 1. Course Outcomes:

On Course, the students should be able to

- CO1: summarize important steps of setting up a new business;
- CO2: give examples of different methods & approaches used to develop new businesses
- CO3: explain key startup development terminology

### 2. Program Outcomes:

This section deals with how well this course meets the following eight overall program outcomes (POs):

- PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and engineering. Specialization to the solution of complex engineering problems.
- PO2. Problem analysis:** Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.
- PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4. Conduct investigations of complex problems:** Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and modeling to complex engineering activities with an understanding of the limitations.
- PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

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**PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

**PO10. Communication:** Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.

**PO11. Project management and finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

**PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**Programme Specific Outcomes - On completion of the B.Tech. (Computer Science and Engineering) degree the graduates will be able to**

**PSO1:** Apply standard Software Engineering practices and strategies in real-time software project development using open-source programming environment or commercial environment to deliver quality product for the organization success

**PSO2:** Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT and data analytics of varying complexity

**PSO3:** Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems

### 3. CO and PO mapping

	P O1	P O2	P O3	P O4	P O5	P O6	P O7	P O8	P O9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C O1	H												M		
C O2	H	M	M	M	M				M	M			M		
C O3	M		H						H	H	H				L

### 4. Course Contents

Total hours=15

#### Unit I

Introduction: Case studies, Myths & Realities about entrepreneurship, entrepreneurial qualities, Why start-ups fail? How to innovate: Design Thinking, Design-Driven Innovation, Systems thinking, Open innovation, How to start a start-up?

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## Unit II

Government incentives for entrepreneurship, Incubation, acceleration, Funding new ventures – bootstrapping, crowd sourcing, angel investors, VCs, debt financing, due diligence, Legal aspects of business (IPR, GST, Labour law)

## Unit III

Cost, volume, profit and break-even analysis, Margin of safety and degree of operating leverage  
Capital budgeting for comparing projects or opportunities Product costing. Product pricing  
Funding new ventures – bootstrapping, crowd sourcing, Angel investors, VCs, debt financing (, and due diligence, Incubation and acceleration, Government incentives for entrepreneurship, Project cost and Financial Closure

## Unit IV

Dos & Dents in entrepreneurship, Growth Hacking, Growth Strategy, Legal aspects of business (IPR, GST, Labor law), Negotiation skill.

## Unit-V

Human Resource management in startups, Pivoting, Entrepreneurial cases, Risk assessment and analysis, Strategy management for entrepreneurial ventures, Factors driving success and failure of ventures, Concluding remarks

## 5. Text Books

1. Effective Entrepreneurial Management: Strategy, Planning, Risk Management, and Organization - Robert D. Hisrich • Veland Ramadani, Springer (2017)
2. Entrepreneurship- Theory, Process Practice –by Kuratko & Hodgetts, Thompson South-Western Publication

## 6. Reference Material:

1. Entrepreneurship –by Robert D. Hisrich (Edition-9)


## 7. Evaluation Scheme

Exam Type	Marks Breakup
Mid Semester Examination	15
End Semester Examination	60
Quiz	10
Assignment	10
Faculty Assessment	5

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 <b>Sushant University</b> Erstwhile Ansal University Gurugram	<b>School of Engineering &amp; Technology</b> <b>Course Outline</b>		
<b>Course Title: Introduction to Managerial Economics</b> <b>20BTC-1ME31T</b>		<b>Course Code:</b>	
<b>Semester: V</b>	<b>Academic Year:</b> <b>2021-2022</b>	<b>Core/Elective: Core</b>	<b>Credits: 2</b>
<b>Course Designed by: Dr.Nidhi Chowdhary</b> <b>E-mail:</b> <b>nidhichowdhary@sushantuniversity.edu.in</b>		<b>Course Instructor: Dr.Nidhi Chowdhary</b> <b>E-mail:</b> <b>nidhichowdhary@sushantuniversity.edu.in</b>	
<b>Pre-requisites: Fundamental concept of Integral and Differential calculus, Differential equations.</b>			

### 1. Course Outcomes

Upon the completion, students should be able to:

CO1: Through the course, the students will get a basics perspective of economics.

CO2: They will understand the importance of Managerial economics for business decision making.

CO3: They will get an insight into the changes of government policy, money supply and its impact on business decision making.

CO4: This course will also introduce various kinds of markets and understand their features.

CO5: The students will learn about the business decision making in terms of demand forecasting, pricing decision and breakeven point etc.

### 2. Programme Educational Objectives (PEOs)

PEO-1 Graduates will apply the knowledge of Computer Science Engineering to solve real world Engineering problems.

PEO-2 To prepare graduates with an outstanding knowledge of engineering, technology and its applied streams along with the management, humanities and various other interdisciplinary subjects for a successful career.

PEO-3 Enable graduates to acquire knowledge of relevant Technologies and multidisciplinary fields including broad social, ethical and environmental issues within which the engineering is practiced.

PEO-4 To create awareness and understanding within the graduates related to societal issues, apart from developing a sense of commitment to the community and profession with sincere.

### 3. Programme Outcomes (POs)

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On successful completion of the program, the Computer Science and Engineering Graduates are expected to:

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and engineering. Specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and modelling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

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PO11. Project management and finance: Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

#### **4. Programme Specific Outcomes (PSO's)**

On completion of the B.Tech (Computer Science and Engineering) degree the graduates will be able to

PSO1: Apply standard Software Engineering practices and strategies in real-time software project development using open-source programming environment or commercial environment to deliver quality product for the organization success

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PSO2: Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT and data analytics of varying complexity

PSO3: Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems

### 5. CO and PO mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO 1	H												M		
CO 2	H	M	M	M	M								M		
CO 3	M		M												L
CO 4	H														L
CO 5	M	M													

### 6. Course Contents

#### Unit I

Basics concept of economics: Introduction to economics, basic economics problem, circular flow of economics activity, nature of the firm –rationale, objectives of maximizing firm value as present value and Marginal and Incremental Analysis, meaning and importance of managerial economics, scope of managerial economics, importance of the study of managerial economics, Basic Calculus: The Calculus of Optimization.

#### Unit II

Demand Analysis and Forecasting: Demand and Supply, Market Equilibrium, Comparative Statics: Changes in Demand and Supply, determinants of market demand at firm and industry level, elasticity of demand, The Production Function, Profit-Maximizing, Cost Minimization and Breakeven analysis, Stages of Production and Law of Variable Proportions. Long run and Short run. Economies and diseconomies of scale

#### Unit III

Features of various markets Perfect competition, Monopoly, monopolistic competition, oligopoly, Macro Economics: Definition of Money, Money -Functions and Forms, Measures of Money Supply - M1, M2, M3 and M4, Role and Function of RBI, Role and function of Commercial Banks, Money and Capital market in India: role and function of money market and capital market

#### Unit IV

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Monetary Policy- Concept, Objectives, Instruments - CRR, SLR, OMO, Bank Rate, Repo Rate, Reverse Repo Rate etc, Fiscal Policy - Concept, Objectives. National Income: Concepts- GDP, NDP, Net factor income from abroad, Net Indirect taxes, market prices, factor cost etc. Definitions. Methods of Measurement of National Income – Output Method, Income Method and Expenditure method. Questions for Revision.

## 7. Text Books

- Vanita A, (2013). *Managerial Economics*, (1sted). Pearson, India.
- Dornbusch, Fisher, & Startz: *Macroeconomics*, Tata McGraw Hill, 10e
- Dwivedi, D.N; *Managerial Economics*, Vikas Publishing House, 8e
- Agarwal, Vanita, (2010) *Macroeconomics Theory and Policy*, Pearson Education. 1e
- Mishra, S. K. and Puri, V. K., *Modern Macroeconomics Theory*, Himalaya Publishing House.
- Shapiro, E., *Macroeconomics Analysis*, McGraw Hill Education, 5e

## 8. Reference Material:

- Economics Times
- Mint
- Special Reports, Daily News, Finance and Economics and Business
- Law of demand - <https://www.youtube.com/watch?v=QvGLcCTXk9o>
- Exceptions to Law of Demand - [https://www.youtube.com/watch?v=e\\_Zty4HCA-Q](https://www.youtube.com/watch?v=e_Zty4HCA-Q)
- Substitutes and Complements - <https://www.youtube.com/watch?v=UixicIRFuYI>

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