

Compulsory course Sustainable Development Goals (SDGs) for all UG & PG Programs

Course Code:

Course Title : **Sustainable Development Goals (SDGs)**

Pre-requisite: Student should have basic knowledge of Environment, Natural resources, Climate change and sustainability.

Rationale: To inculcate the knowledge base on sustainable development with a view to balance our economic, environmental and social needs, allowing prosperity for now and future generations. To train students to undertake major initiatives in the efficient management of natural resources and the prevention of environmental pollution with focus on Sustainable Development.
To use environmental management tools that help to improve the quality of environment, to assess local vulnerabilities with respect to climate, natural disasters and to achieve sustainable developmental needs.

Course Outcomes:

VAC101.1: Examine critically the 17 newly minted UN Sustainable Development Goals and understand the historical evolution, key theories, and concepts of sustainable development.

VAC101.2: Identify and apply methods for assessing the achievement of sustainable development and discover the science, technology, economics, and politics underlying the concepts of sustainability.

VAC101.3: Understand the implications of overuse of resources, population growth and economic growth and sustainability and explore the challenges the society faces in making transition to renewable resource use.

VAC101.4: Develop skills to understand attitudes on individuals, society and their role regarding causes and solutions in the field of sustainable development and apply critical thinking skills to evaluate the quality, credibility and limitations of an argument for solution.

VAC101.5: Describe the steps of the design thinking methodology and how design thinking can accelerate effective SDG implementation. Deepen knowledge and pedagogical tools to incorporate values-based education for sustainable development in educational programmes and processes.

Scheme of Studies:

Board of Study	Course Code	Course Title	Scheme of studies(Hours/Week)					Total Credits (C)
			CI	LI	SW	SL	Total Study Hours (CI+LI+SW+SL)	
Program Core VAC	VAC101	Sustainable Development Goal	2	0	1	1	4	2

Legend: **CI:** Class room Instruction (Includes different instructional strategies i.e.Lecture (L) and Tutorial (T) and others),
LI: Laboratory Instruction (Includes Practical performances in laboratory workshop, field or other locations using different instructional strategies)
SW: Sessional Work (includes assignment, seminar, mini projectetc.),
SL: Self Learning,
C: Credits.

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Note: SW & SL has to be planned and performed under the continuous guidance and feedback of teacher to ensure outcome of Learning.

Scheme of Assessment:

Theory

Board of Study	Course Code	Course Title	Scheme of Assessment (Marks)							
			Progressive Assessment (PRA)						End Semester Assessment	Total Marks (PRA+ ESA)
			Class/Home Assignm ent 5 number 3 marks each (CA)	Class Test 2 (2 best out of 3) 10 marks each (CT)	Seminar one (SA)	Class Activit y any one (CAT)	Class Attendanc e (AT)	Total Marks (CA+CT+ SA+CAT +AT)		
VAC	VAC 101	Sustaina ble Develop ment Goal	15	20	5	5	5	50	50	100

Course-Curriculum Detailing:

This course syllabus illustrates the expected learning achievements, both at the course and session levels, which students are anticipated to accomplish through various modes of instruction including Classroom Instruction (CI), Laboratory Instruction (LI), Sessional Work (SW), and Self Learning (SL). As the course progresses, students should showcase their mastery of Session Outcomes (SOs), culminating in the overall achievement of Course Outcomes (COs) upon the course's conclusion.

VAC101.1: Examine critically the 17 newly minted UN Sustainable Development Goals and understand the historical evolution, key theories, and concepts of sustainable development.

Approximate Hours

Item	AppX Hrs
CI	06
LI	0
SW	1
SL	1
Total	8

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Session Outcomes (SOs)	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self Learning (SL)
SO1.1 Understand about Sustainable Development SO1.2 Understand the Need and Importance of SDGs SO1.3 Understand the historical evolution of SDGs SO1.4 Gain knowledge of SDGs Different goals and their importance SO1.5 Explain the Challenges & strategies of attaining SDGs in countries..		Unit-1.0 Introduction to Sustainable Development 1.1 Need and Importance of Sustainable Development 1.2 Historical & Policy perspectives of Sustainable Development 1.3 Sustainable Development: World and India Perspective 1.4 Introduction to 17 SDGs 1.5 Specific learning objectives for different SDGs 1.6 Challenges & strategies of attaining SDGs in developed and developing nations	Different SDG goals details and its importance

SW-1 Suggested Sessional Work (SW):

a. Assignments:

Overview of SDGs, Sustainable Consumption and Production, Details of 17 SDGs

b. Other Activities (Specify):

Note down the different challenges in our state and district to achieve SDG

VAC101.2: : Identify and apply methods for assessing the achievement of sustainable development and discover the science, technology, economics, and politics underlying the concepts of sustainability and measuring.

Approximate Hours

Item	AppX Hrs
CI	06
LI	0
SW	1
SL	1
Total	8

Session Outcomes	Laboratory	Classroom Instruction	Self
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(SOs)	Instruction (LI)	(CI)	Learning (SL)
SO2.1 Explain Sustainable Development SO2.2 Understand the NEP-2020 and SDG SO2.3 Discuss higher Education role to achieve SDGs SO2.4 Explain how education for Sustainable Development SO2.5 Explain the measuring techniques for Sustainability		Unit-2.0 Special focus on SDG 4- Quality Education and Lifelong Learning: 2.1 Focus of NEP-2020 on SDG 2.2 Education for Sustainable Development (ESD): 2.3 Berlin Declaration 2021 on ESD 2.4 Integration of ESD in curriculum and textbooks 2.5 Tools, Systems, and Innovation for Sustainability 2.6 Measuring Sustainability: How do we measure sustainability	1 NEP2020 objectives and concept for SDGs 2. Concept ,Tools and techniques for measuring sustainability

SW-1 Suggested Sessional Work (SW):

c. Assignments:

Education role to achieve SDGs, The role of education in Sustainable Development , Measuring techniques of sustainability, Sustainability Indicators

d. Other Activities (Specify): Seminar and group discussion on ESD and measuring sustainability Millennium Development Goals (MDGs)

VAC101.3: Understand the implications of overuse of resources, population growth and economic growth and sustainability and explore the challenges the society faces in making transition to renewable resource use.

Approximate Hours

Item	AppX Hrs
CI	06
LI	0
SW	1
SL	1
Total	8

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Session Outcomes (SOs)	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self Learning (SL)
SO3.1 Understand current economic issues in the context of the global sustainable development debate. SO3.2 Outline of health, hygiene and water sanitation issues. SO3.3 Discuss the renewable energy resources and its importance in present scenario SO3.4 Explain the importance of sustainable production and consumption SO3.5 Explain the problems and solution in rural and urban areas.		Unit-3.0 Understanding the SDGs 3.1 Circular economy (basic model of reuse, recycle, and reduce) 3.2 Rural & urban Problems & Challenges 3.3 Sustainable production and consumption 3.4 Renewable energy 3.5 Health & Hygiene, water , sanitation & water management 3.6 Waste Management	1. Water treatment and management practices. 2. Non renewable energy resources.

SW-1 Suggested Sessional Work (SW):

Smart cities

e. Assignments:

Ecofriendly energy resources importance, types of waste and its management, Urban Problems & Challenges

Other Activities (Specify):

Visit of waste water treatment plant, Visit of water treatment process.

VAC101.4: Develop skills to understand attitudes on individuals, society and their role regarding causes and solutions in the field of sustainable development and apply critical thinking skills to evaluate the quality, credibility and limitations of an argument for solution.

Approximate Hours

Item	AppX Hrs
CI	06
LI	0
SW	1
SL	1
Total	8

Session Outcomes (SOs)	Laboratory Instruction	Classroom Instruction (CI)	Self Learning (SL)

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	(LI)		
SO4.1 Understand environmental sustainability is crucial in reducing the impacts of climate change SO4.2 Discuss causes of emission of GHGs and its consequences SO4.3 Explain how climate change and sustainable development both play a role in shaping the human and environmental factors of the world. SO4.4 Explain the importance of sustainable production and consumption SO4.5 Climate change is disrupting national economies and affecting lives and livelihoods, especially for the most vulnerable and its mitigation.		Unit-4.0 Climate Change, Energy and Sustainable Development 4.1 The greenhouse effect: Causes and Consequences 4.2 Climate Change: A Threat to Sustainable Development 4.3 Adaptation to Current and Future Climate Regimes 4.4 The consequences: crop failure 4.5 Solutions technology and lifestyle changes 4.6 Mitigating Climate Change	1 Agreement on Climate Change, Trade, and Sustainability Carbon Credit, carbon trading Kyoto Protocol

SW-1 Suggested Sessional Work (SW):

f. Assignments:

Urban Sustainability and Climate Change, Sustainable Development Policies, Agreement on Climate Change, Trade and Sustainability, Resilient cities – What makes a city sustainable, green, and resilient

Other Activities (Specify):

VAC101.5: Describe the steps of the design thinking methodology and how design thinking can accelerate effective SDG implementation. Deepen knowledge and pedagogical tools to incorporate values-based education for sustainable development in educational programmes and processes.

Approximate Hours

Item	AppX Hrs
CI	06
LI	0
SW	1
SL	1
Total	8

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Session Outcomes (SOs)	Laboratory Instruction (LI)	Classroom Instruction (CI)	Self Learning (SL)
SO4.1 Understand the relevance and the concept of sustainability and the global initiatives in this direction SO4.2 Understand role of Corporations and Ecological Sustainability. SO4.3 Explain role of CSR in Sustainability. SO4.4 Understand the SD challenge for companies, their responsibility and their potentials for action SO4.5 Discuss the role of world government for world justice and peace		Unit-5.0 Sustainable Business Practices: 5.1 Corporate Social Responsibility 5.2 Sustainable products and services 5.3 Business and Environment 5.4 Corporations and Ecological Sustainability 5.5 Life Cycle Assessment: <ul style="list-style-type: none"> LCA Overview and Application 5.6 World peace and justice: <ul style="list-style-type: none"> United nations goals for peace and justice World Government for peace 	Local to the Global: Can Sustainable Development Work

SW-1 Suggested Sessional Work (SW):

g. Assignments:

Consumption Patterns and Lifestyles, Company Perspectives for Environmental Sustainability, An Introduction to Economic Growth

Other Activities (Specify):

Brief of Hours suggested for the Course Outcome

Course Outcomes	Class Lecture (CI)	Sessional Work (SW)	Self Learning (SI)	Total hour (CI+SW+SI)
VAC101.1: Examine critically the 17 newly minted UN Sustainable Development Goals and understand the historical evolution, key theories, and concepts of sustainable development.	6	1	1	8
VAC101.2: Identify and apply methods for assessing the achievement of sustainable development and discover the science, technology, economics, and politics underlying the concepts of sustainability.	6	1	1	8
VAC101.3: Understand the implications of overuse of resources, population growth and economic growth and sustainability and explore the challenges the society faces in making transition to renewable resource use.	6	1	1	8
VAC101.4: Develop skills to understand attitudes on individuals, society and their role regarding causes and solutions in the field of sustainable development and apply critical thinking skills to evaluate the quality, credibility and limitations of an argument for solution.	6	1	1	8

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VAC101.5: Describe the steps of the design thinking methodology and how design thinking can accelerate effective SDG implementation. Deepen knowledge and pedagogical tools to incorporate values-based education for sustainable development in educational programmes and processes.	6	1	1	8
Total Hours	30	5	5	40

Suggestion for End Semester Assessment

Suggested Specification Table(For ESA)

CO	Unit Titles	Marks Distribution			Total Marks
		R	U	A	
CO-1	Need and Importance of Sustainable Development	03	01	01	05
CO-2	Education for Sustainable Development (ESD): Tools, Systems, and Innovation for Sustainability	02	06	02	10
CO-3	Discuss the sustainable production and consumption	03	07	05	15
CO-4	How Climate Change may be Threat to Sustainable Development	-	10	05	15
CO-5	Role of Corporations and Ecological Sustainability	03	02	-	05
Total		11	26	13	50

Legend: R: Remember, U: Understand, A: Apply A: Analyse E:Evaluate C:Create

The end of semester assessment for Sustainable Development Goals will be held with written examination of 50 marks

Note. Detailed Assessment rubric need to be prepared by the course wise teachers for above tasks. Teachers can also design different tasks as per requirement, for end semester assessment.

Suggested Instructional/Implementation Strategies:

1. Improved Lecture
2. Tutorial
3. Case Method
4. Group Discussion
5. Role Play
6. Visit to industry, water treatment plant
7. Demonstration
8. ICTBasedTeachingLearning(VideoDemonstration/TutorialsCBT,Blog,Facebook, Twitter,Whatsapp,Mobile,Onlinesources)
9. Brainstorming

Suggested Learning Resources:

(a) Books:

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S. No.	Title	Author	Publisher	Edition & Year
1	The Economics of Sustainable Development: The Case of India (Natural Resource Management and Policy)"	Surender Kumar and Shunsuke Managi	Springer Switzerland	2009
2	Corporate Social Responsibility in Developing and Emerging Markets	<u>Onyeka Osuji</u>	Cambridge	New Edition June 2022
3	Smart Cities for Sustainable Development	<u>Ram Kumar Mishra, Ch Lakshmi Kumari, Sandeep Chachra, P.S. Janaki Krishna</u>	Springer Switzerland	March 2022
4	Sustainable Development: Linking Economy, Society, Environment	Tracey Strange and Anne Bayley		
5	Management Of Resources For Sustainable Devpt	Sushma Goyal	The Orient Blackswan	2016
6	Energy, Environment and Sustainable Development: Issues and Policies	S. Ramaswamy Sathis G. Kumar	Regal Publications	2009
7	The New Map: Energy, Climate, and the Clash of Nations	<u>Daniel Yergin</u>	Penguin Press	September 2015
8	Contributions of Education for Sustainable Development (ESD) to Quality Education:	Laurie, R., Nonoyama-Tarumi, Y., Mckeown, R., & Hopkins, C.	A Synthesis of Research. Journal of Education for Sustainable Development, 10(2), 226–242.	2016
9	Sustainable Results in Development: Using the SDGs for Shared Results and Impact	OECD	OECD Publishing, Paris	2019
10	Development Discourse and Global History from colonialism to the sustainable development goals	Ziai, Aram	Routledge, London & New York	2016
11	Sustainable Development Goals An Indian Perspective,	Hazra, Somnath., Bhukta, Anindya	Springer Switzerland	2020
12	Environmental Ecology, Biodiversity and Climate Change	HM Saxena	Rawat Publication	January 2021
13	https://www.un.org/sustainabledevelopment/			
14	https://www.aiu.ac.in/documents/AIU_Publications/UN-SDG goals			
15	https://www.unesco.org/en/education-sustainable-development			

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16	https://onlinecourses.nptel.ac.in/noc23_hs57/preview
17	https://www.iau-hesd.net/news/5180-berlin-declaration-education-sustainable development-adopted-unesco-esd-conference-17-19

Curriculum Development Team

Professor G C Mishra, Director Cement Technology, AKS University

Professor Kamlesh Choure, Head Dept of Biotechnology AKS University

Professor Mahendra Kumar Tiwari, Head Deptt of Environmental Science, AKS University

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COs, POs and PSOs Mapping

Course Code : VAC101

Course Title: Sustainable Development Goals (SDGs)

Course Outcomes	Program Outcomes												Program Specific Outcome			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	PSO 4
	knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineering and society	Environment and sustainability:	Ethics	Individual and teamwork:	Communication:	Project management and finance:	Life-long learning	The ability to apply technical & engineering knowledge to mitigate the consequences of global warming	Ability to understand the Different SD Goals and their significance	Ability to understand the latest Technology to achieve SD	Ability to use the research based innovative knowledge for SDGs
CO1: Examine critically the 17 newly minted UN Sustainable Development Goals and understand the historical evolution, key theories, and concepts of sustainable development.	1	1	1	2	3	2	3	2	2	1	3	2	2	3	3	1

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CO2: Identify and apply methods for assessing the achievement of sustainable development and discover the science, technology, economics, and politics underlying the concepts of sustainability.	1	1	2	2	1	2	3	2	1	1	2	2	2	2	2	1
CO3: Understand the implications of overuse of resources, population growth and economic growth and sustainability and explore the challenges the society faces in making transition to renewable resource use.	2	2	1	1	1	2	2	2	1	2	1	2	1	1	2	2
CO4: Develop skills to understand attitudes on individuals, society and their role regarding causes and solutions in the field of sustainable	3	2	2	2	3	2	3	2	2	1	2	3	3	3	3	2

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development and apply critical thinking skills to evaluate the quality, credibility and limitations of an argument for solution.																
CO5: Describe the steps of the design thinking methodology and how design thinking can accelerate effective SDG implementation. Deepen knowledge and pedagogical tools to incorporate values-based education for sustainable development in educational programmes and processes	-	-	-	1	1	3	3	3	1	1	2	2	3	3	1	3

Legend:1–Low,2–Medium, 3–High

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Course Curriculum Map:

POs & PSOs No.	Cos No. & Titles	SOs No.	Laboratory Instruction (LI)	Classroom Instruction(CI)	Self Learning (SL)
PO1,2,3,4,5,6 7,8,9,10,11,12 PSO 1,2, 3, 4, 5	CO1: Examine critically the 17 newly minted UN Sustainable Development Goals and understand the historical evolution, key theories, and concepts of sustainable development.	SO1.1 SO1.2 SO1.3 SO1.4 SO1.5		Unit-1.0 Introduction to Sustainable Development: 1.1,1.2,1.3,1.4,1.5,1.6,1.7,	As mentioned in page number 17to 25
PO1,2,3,4,5,6 7,8,9,10,11,12 PSO 1,2, 3, 4, 5	CO2: Identify and apply methods for assessing the achievement of sustainable development and discover the science, technology, economics, and politics underlying the concepts of sustainability.	SO2.1 SO2.2 SO2.3 SO2.4 SO2.5		Unit-2 Special focus on SDG 4-Quality Education and Lifelong Learning: 2.1,2.2,2.3,2.4,2.5,2.6, 2.7, 2.8,2.9	
PO1,2,3,4,5,6 7,8,9,10,11,12 PSO 1,2, 3, 4, 5	CO3: Understand the implications of overuse of resources, population growth and economic growth and sustainability and explore the challenges the society faces in making transition to renewable resource use.	SO3.1 SO3.2 SO3.3 SO3.4 SO3.5		Unit-3 : Understanding the SDGs: 3.1, 3.2,3.3,3.4,3.5,3.6,3.7,3.8	

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PO1,2,3,4,5,6 7,8,9,10,11,12 PSO 1,2, 3, 4, 5	CO4: Develop skills to understand attitudes on individuals, society and their role regarding causes and solutions in the field of sustainable development and apply critical thinking skills to evaluate the quality, credibility and limitations of an argument for solution.	SO4.1 SO4.2 SO4.3 SO4.4 SO4.5		Unit-4 : Climate Change, Energy and Sustainable Development 4.1, 4.2,4.3,4.4,4.5,4.6,4.7
PO1,2,3,4,5,6 7,8,9,10,11,12 PSO 1,2, 3, 4, 5	CO5: Describe the steps of the design thinking methodology and how design thinking can accelerate effective SDG implementation. Deepen knowledge and pedagogical tools to incorporate values-based education for sustainable development in educational programmes and processes	SO5.1 SO5.2 SO5.3 SO5.4 SO5.5		Unit 5: Sustainable Business Practices, LCA and World peace and justice 5.1,5.2,5.3,5.4,5.5,5.6