गोंय विद्यापीठ
ताळगांव पठार,
गोंय - ४०३ २०६
फोन : + ९१ - ८६६९६०९०४८

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(Accredited by NAAC with Grade A+)

GU/Acad –PG/BoS -NEP/2026-27/173 Date: 25.06.2026

CIRCULAR

In supersession to the Circular No. GU/Acad –PG/BoS -NEP/2025-26/560 dated 18.11.2025 the syllabus of Value-Added Courses is attached, incorporating the following change:

- Added new Course VAC-124 "Peace Education Program" under Category D-Health & Wellness, Yoga Education, Sports & Fitness.

The Deans of the Schools/Faculty and Principals of the affiliated Colleges offering the Undergraduate General Education Programmes are requested to take note of the above and bring the contents of the Circular to the notice of all concerned.

ASHWIN V LAWANDE Digitally signed by ASHWIN V LAWANDE Date: 2026.06.25 17:37:38 +05'30'

(Ashwin V. Lawande)
Deputy Registrar – Academic

To,
1. The Deans of the Schools/Faculty, Goa University.
2. Principals of the affiliated Colleges offering the Undergraduate General Education Programmes.

Copy to:
1. Director, Directorate of Higher Education, Govt. of Goa.
2. Chairperson, BoS in Interdisciplinary and Transdisciplinary Studies, Goa University.
3. Controller of Examinations, Goa University.
4. Assistant Registrar Examinations (UG), Goa University.
5. Director, Directorate of Internal Quality Assurance, Goa University for uploading the Syllabus on the University website.

Students shall be required to opt for One Course from each Category A, B C and D during the First year. (4 VAC Courses of 2 Credits each. 2 Courses of 2 Credits each in Semester I and 2 Courses of 2 Credits each in Semester II).

Course Code	Value Added Courses (VAC)	Credits
A	**Environmental Science and Education**	
VAC-100	Environmental Studies I	2
VAC-101	Environmental Studies II	2
VAC-102	Environmental Practices in Goa	2
VAC-103	Sustainable Development and Ecology	2
VAC-123	Solid Waste Management	2
B	**Understanding India**	
VAC-104	Constitutional Values and Obligations	2
VAC-105	Elections and Electoral Management in India	2
VAC-106	NCC (Army) 1	2
VAC-120	NCC (Army) 2	2
VAC-107	NCC (Navy) 1	2
VAC-121	NCC (Navy) 2	2
VAC-108	Introduction to the Folktales of India	2
VAC-109	Indian Economic Thought	2
VAC-122	Vedic Mathematics	2
C	**Digital & Technological Solutions**	
VAC-110	Awareness of Cyber Crimes and Security	2

VAC-111	E-Waste Management	2
VAC-112	Green Energy Systems	2
VAC-113	Medical Gadgets for Health Care	2
D	**Health & Wellness, Yoga Education, Sports & Fitness**	
VAC-114	Health and Wellness	2
VAC-115	Yoga and Ayurveda	2
VAC-116	Life Skills	2
VAC-117	Youth Empowerment using Mind Management	2
VAC-118	Health and Physical Education	2
VAC-119	Exercise Science and Nutrition for Fitness	2
VAC-124	Peace Education Program	2

A. Environmental Science and Education

Name of the Programme : UG General Education Programmes
Course Code : VAC-100
Title of the Course : Environmental Studies I
Number of Credits : 02
Effective from AY : 2023-24

Pre-requisites for the Course:	Nil	
Course Objectives:	Sensitise students to environmental conservation and sustainable use of resources	
Content:	**Module 1**: Multidisciplinary nature of environmental studies Definition, scope and importance Need for public awareness. Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems. Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man-induced landslides, soil erosion and desertification. • Role of an individual in conservation of natural resources. • Equitable use of resources for sustainable lifestyles.	**15 hours**
	Module 2: Ecosystems Concept of an ecosystem. Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem: - a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries); Biodiversity and its conservation Introduction – Definition: genetic, species and ecosystem diversity. Biogeographical classification of India, Value of biodiversity: consumptive use, productive use, social,	**15 hours**

	ethical, aesthetic and option values, Biodiversity at global, National and local levels. India as a mega-diversity nation IV, Hot-sports of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India, Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	
Pedagogy:	Class lectures, Case Studies, Field visits	
References/ Readings:	1. Agarwal K.C. (2001): Environmental Biology, Bikaner, Nidi 2. Bharucha E.: The Biodiversity of India, Ahmedabad, Mapin 3. Bharucha E.: Textbook of Environmental Studies. Orient BlackSwan 4. Brunner R.C. (1989): Hazardous Waste Incineration, New York, McGraw-Hill 5. Chatwal G.R. & Sharma H. (2005: A Textbook of Environmental Studies, Mumbai,Himalaya 6. Clark R.S.: Marine Pollution, Oxford, Clanderson 7. Cunningham W.P., Cooper T.H., Gorani E. & Hepworth M.T. (2001): Environmental Encyclopaedia, Mumbai, Jaico. 8. De A.K.: Environmental Chemistry, Wiley 9. Desai R.J. (2003): Environmental Studies, Mumbai, Vipul, Goa University, Taleigao Plateau, Goa 10. Gleick H.P. (1993): Water in Crisis, Stockholm Envt. Institute, OUP 11. Hawkins R.E.: Encyclopedia of Indian Natural History, Mumbai, BNHS 12. Heywood V.H. & Watson R.T. (1995): Environment Protection and Laws, Mumbai, Himalaya 13. Jadhav H. & Bhosale V.M. (1995): Environment Protection and Laws, Mumbai, Himalaya 14. McKiney M.L. & Schoel R.M. (1996): Environment Science, Systems and Solutions, Web Enhanced Edition. 15. Mhaskar A.K.: Matter Hazardous, Techno-Science Publications 16. Miller T.G. Jr.: Environmental Science, Wadsworth 17. Odum E.P. (1971): Fundamentals of Ecology, Philadelphia, W.B. Saunders 18. Rao M.N. & Datta A.K. (1986): Waste Water Treatment, Oxford & IBH 19. Santra S.C. (2004): Environmental Science, Kolkata, Central Book Agency 20. Sharma B.K. (2001): Environmental Chemistry, Meerut, Goel Publishing House 21. Townsend C., Harper J. & Begon M.: Essentials of Ecology, Blackwell Science 22. Trivedi R.K.: Handbook of Environmental Laws, Rules, Guidelines, Compliances and, Standards, Vol.1 & 2, Enviro Media. 23. Trivedi R.K. & P.K. Goel: Introduction to Air Pollution, Techno-Science Publications	

	24. Wagner K.D. (1998) Environmental Management, Philadelphia, W.B. Saunders Magazines 25. Down to Earth, Centre for Science & Environment, Survey of the Environment published by The Hindu E- resource http://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf
Course Outcomes:	Students will have the ability to 1. Distinguish between renewable and non-renewable resources 2. Understand different ways to manage resources sustainability 3. Appreciate the value of bio-diversity and its management

Name of the Programme : **UG General Education Programmes**
Course Code : **VAC-101**
Title of the Course : **Environmental Studies II**
Number of Credits : **02 (1T +1P)**
Effective from AY : **2023-24**

Pre-requisites for the Course:	Nil	
Course Objectives:	Sensitise students to environmental conservation	
Content:	**Module 1** : Environmental Pollution Definition • Cause, effects and control measures of :- a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards • Solid waste Management : Causes, effects and control measures of urban and industrial wastes. • Role of an individual in the prevention of pollution. • Pollution case studies. • Disaster management : floods, earthquakes, cyclone and landslides. Social Issues and the Environment • From Unsustainable to Sustainable development • Urban problems related to energy • Water conservation, rainwater harvesting, watershed management • Resettlement and rehabilitation of people; its problems and concerns. Case Studies • Environmental ethics: Issues and possible solutions. • Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and the holocaust. Case Studies. • Wasteland reclamation. • Consumerism and waste products. • Environment Protection Act. • Air (Prevention and Control of Pollution) Act. • Water (Prevention and control of Pollution) Act • Wildlife Protection Act • Forest Conservation Act • Issues involved in the enforcement of environmental legislation. • Public awareness.	**10 Hours**
	Module 2: Human Population and the Environment • Population growth, variation among nations. • Population explosion – Family Welfare Programme. Environment and human health. • Human Rights. • Value Education. • HIV/AIDS. • Women and Child Welfare. • Role of Information Technology in Environment and human health. • Case Studies.	**5 hours**
	Field work Visit a local area to document environmental assets river/forest/grassland/hill/mountain • Visit a local polluted site-Urban/Rural/Industrial/Agricultural • Study common plants, insects, and birds. Study of simple ecosystems-pond, river, hill slopes, etc.	**30 hours**

Pedagogy:	Class lectures, Case Studies, Field visits
References/ Readings:	1. Agarwal K.C. (2001): Environmental Biology, Bikaner, Nidi 2. Bharucha E.: The Biodiversity of India, Ahmedabad, Mapin 3. Bharucha E.: Textbook of Environmental Studies. Orient BlackSwan 4. Brunner R.C. (1989): Hazardous Waste Incineration, New York, McGraw-Hill 5. Chatwal G.R. & Sharma H. (2005: A Textbook of Environmental Studies, Mumbai, Himalaya 6. Clark R.S.: Marine Pollution, Oxford, Clanderson 7. Cunningham W.P., Cooper T.H., Gorani E. & Hepworth M.T. (2001): Environmental Encyclopaedia, Mumbai, Jaico. 8. De A.K.: Environmental Chemistry, Wiley 9. Desai R.J. (2003): Environmental Studies, Mumbai, Vipul, Goa University, Taleigao Plateau, Goa 10. Gleick H.P. (1993): Water in Crisis, Stockholm Envt. Institute, OUP 11. Hawkins R.E.: Encyclopaedia of Indian Natural History, Mumbai, BNHS 12. Heywood V.H. & Watson R.T. (1995): Environment Protection and Laws, Mumbai, Himalaya 13. Jadhav H. & Bhosale V.M. (1995): Environment Protection and Laws, Mumbai, Himalaya 14. McKiney M.L. & Schoel R.M. (1996): Environment Science, Systems and Solutions, Web Enhanced Edition. 15. Mhaskar A.K.: Matter Hazardous, Techno-Science Publications 16. Miller T.G. Jr.: Environmental Science, Wadsworth 17. Odum E.P. (1971): Fundamentals of Ecology, Philadelphia, W.B. Saunders 18. Rao M.N. & Datta A.K. (1986): Waste Water Treatment, Oxford & IBH 19. Santra S.C. (2004): Environmental Science, Kolkata, Central Book Agency 20. Sharma B.K. (2001): Environmental Chemistry, Meerut, Goel Publishing House 21. Townsend C., Harper J. & Begon M.: Essentials of Ecology, Blackwell Science 22. Trivedi R.K.: Handbook of Environmental Laws, Rules, Guidelines, Compliances and, Standards, Vol.1 & 2, Enviro Media. 23. Trivedi R.K. & P.K. Goel: Introduction to Air Pollution, Techno-Science Publications 24. Wagner K.D. (1998) Environmental Management, Philadelphia, W.B. Saunders Magazines 25. Down to Earth, Centre for Science & Environment, Survey of the Environment published by The Hindu **E- resource** http://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf

Course Outcomes:	Students will be able to: 1. Understand the impact of pollution on human welfare 2. Appreciate ethical issues of environmental rights and duties 3. Undertake preliminary field analysis of environmental damage

Name of the Programme : UG General Education Programmes
Course Code : VAC-102
Number of Credits : 02
Title of the Course : Environmental Practices in Goa
Effective from AY : 2023-24

Pre-requisites for the Course:	Nil	
Course Objectives:	1. To introduce and acquaint students to Goa's rich Natural Heritage and the importance of sacred groves of Goa. 2. Create awareness in students about role of Sacred Groves, Oral Traditions & myths in Conserving Biodiversity.	
Content:	**Unit I: Sacred Groves** 1. Meaning of Nature worship, Sacred groves, Protector spirits and Natural Heritage 2. Types of Sacred Groves. 3. Ecological importance of sacred Groves in Goa. 4. Guardian Spirits of Goa 5. Threats to sacred groves and biodiversity in Goa. 6. Strategies to protect the Sacred Groves	**15 hours**
	Unit II: Intertwining Culture, Religion and Society 1. Oral Traditions protecting Goa's biodiversity. 2. Meaning and types of Nature worships 3. Myths contributing towards protection nature 4. Common taboos and beliefs in the practice of Nature worship. 5. Goan practices and rituals related to Nature worship 6. Ecological Festivals of Goa.	**15 hours**
Pedagogy:	Multimedia and ICT based teaching learning.	
References/ Readings:	1. Kerkar, Rajendra. *Sacred Groves of Goa.* Saligao, Goa: Goa State Biodiversity Board,2019 2. Kerkar, Rajendra. *Natural Heritage of Goa*. Panaji, Goa: Broadway Publishing House, 2006. 3. Gadgil, Madhav and Vartak, V.D. "Sacred groves of India : A plea for Continued conservation" *Journal of Bombay Natural History Society*, vol. 72, 1975. 4. Alvares, Claude (ed.). *Fish, Curry and Rice*, Mapusa: The Goa Foundation, 2002.	
Course Outcomes:	1. Develop respect for rich Heritage of Goa and also work towards protection of Nature. 2. Promote and inculcate intrinsic values toward Biodiversity by replacing human- centered approach with bio-centric values.	

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Name of the Programme : **UG General Education Programmes**
Course Code : **VAC-103**
Title of the Course : **Sustainable Development and Ecology**
Number of Credits : **02**
Effective from AY : **2023-24**

Pre-requisites for the Course:	Nil	
Course Objectives:	1. To create awareness of environmental issues and need for sustainable development 2. To highlight current ecological issues and alternatives measures	
Content:	**Unit I: Concept of Sustainable Development** 1. Social Ecology and Bio-regionalism 2. Role of Corporate Social Responsibility (CSR) in sustaining ecology and development 3. Role of Ecofeminism in sustaining ecology 4. Dimensions of the 'Common Concerns' on Environment and Human wellbeing. 5. Geo-Politics 6. Economic Sustainability: Modifying Natural Resource Use.	**15 hours**
	Unit II: Ecological Measures for Sustainable development 1. Controlled use of natural resources 2. Re-cycling of E-waste 3. Eco-farming 4. Save Soil Movement 5. Scientific Challenges of the 21st Century 6. Developing a Global Vision	**15 hours**
Pedagogy:	Lectures, Discussions and Tutorials	
References/ Readings:	1. Jardins, Joseph R. Des: *Environmental Ethics: An Introduction to Environmental Philosophy,* 3rd Ed. Belmont CA: Wadsworth, 2001. 2. Sanwal, Mukul: *The World's Search for Sustainable Development – A Perspective from the Global South"*, Delhi: Cambridge University Press, 2015. 3. Frey, R. G. and Heath Wellman Christopher (eds.): *A Companion to Applied Ethics*, Malden: Blackwell Publishing, 2005. 4. Pojman, Louis P.: *Environmental Ethics: Readings in Theory and Application* 3rd Ed, Belmont: Thomson Wadsworth, 2001.	
Course Outcomes	1. To make students understand the various concepts under ecological issues and sustainable development. 2. Students will be acquainted with various measures for sustainable development	

Name of the Programme : **UG General Education Programmes**
Course Code : **VAC-123**
Title of the Course : **Solid Waste Management**
Number of Credits : **02**
Effective from AY : **2024-25**

Pre-requisites for the Course:	Nil	
Course Objectives:	To understand 1. sources, causes and effects of Solid Waste (SW). 2. various techniques of Solid Waste Management (SWM) and its applications.	
Content:		**No of hours**
	Introduction to SWM Concept, sources/causes – domestic garbage, solid waste material from various industries, agricultural waste, plastics, glass, metals, e-waste, medical waste, Construction waste, sewage sludge, Collection, transportation, and disposal–methods and procedures. Effect of Poor SWM. The present scenario in India with respect to SWM – including legal provisions.	**15**
	Sustainable Techniques for SWM. Economics of waste Segregation- value chain and Sorting and Composting (including Home composting) Circular Economy – Recycling and Reuse- Costs of disposal, Landfills. Solid Waste Management Hierarchy, and strategies for waste minimization. Role for government and communities	**15**
Pedagogy:	Group Discussion, Classroom Presentation, Quiz, Short Assignment, Field visits, case studies.	
Text Book/ Reference	1. Tchobanoglous G. and Kreith F. 2002 Handbook of Solid Waste Management, second ed. McGraw-Hill, Inc., New Delhi.	
References/ Additional Readings:	1. Ramachandra T V, 2009. Municipal Solid Waste Management, TERI Press, New Delhi **Additional Readings** 2. UNEP. (1996). International Source Book on Environmentally Sound Technologies for Municipal Solid Waste Management (6). IETC,	

	Osaka/Shiga. 3. http://ces.iisc.ernet.in/energy/SWMTR/TR85.html
Course Outcomes:	1. Classify the various types of waste 2. Understand environmental sustainability through SWM. 3. Apply and communicate the techniques of SWM.

B. Understanding India

Name of the Programme : UG General Education Programmes
Course Code : VAC-104
Title of the Course : Constitutional Values and Obligations
Number of Credits : 02
Effective from AY : 2023-24

Pre-requisites for the Course	Nil	
Course Objectives:	1. Understand Constitutional Values. 2. Be familiar with Fundamental Rights, Obligations of a State and Fundamental Duties	
Content:	**Unit 1: Evolution and structure of the Constitution** Constituent Assembly and the Constitution: Drafting of the Constitution, Tenets of Preamble including Secular, Socialist, Democratic, Republic, Republic State, Justice, Equality, Fraternity and Liberty. Main features of Indian Constitution: Basic Structure of Constitution. Rigidity and Flexibility, Federal structure, Rule of Law, Separation of Powers, Parliamentary Form of Government, Independent Judiciary and Citizenship.	**15 hours**
	Unit 2: Fundamental Rights, Directive Principles of State Policy and Fundamental Duties Fundamental Rights : Right to Equality, Freedom of Speech and Expression, Right to Life and Personal Liberty, Right against Exploitation, Right to Freedom of Religion, Cultural and Educational Rights and Right to Constitutional Remedies. Directive Principles of State Policy and its enforceability. Fundamental Duties: Moral Duty and Civic Duty ,Concept of Environmental Constitutionalism, PILs filed invoking Fundamental Duties and Judicial approach to Fundamental Duties.	**15 hours**
Pedagogy:	**1 Lectures/Interactive Sessions/ Group Discussions/ Assignments** **2 .Experiential Learning** : Identifying violations of Fundamental Rights in society by conducting interviews of affected parties. Reflections on violation of Fundamental Rights during Group discussion Conducting a survey on awareness about Fundamental Duties	
Reference/ Readings:	1. Basu, D. D. (2019). *Introduction to Constitution.* Lexis Nexix. 2. Kashyap, S. C. (2019). *Our Constitution : An Introduction to India's Constitution and Consitutional Law.* National Book Trust, India. 3. Jain, M. P. (2022). *Indian Constitutional Law.* Lexis Nexis.	

	4. Shukla, V.N. (2023). *Constitution of India.* Eastern Book Company.
Course Outcomes	At the end of the course, the students will be able to: 1. Explain the relevance of Constitution of India in a democratic setup. 2. Describe the Fundamental Rights and Fundamental Duties. 3. Explain the policy of governance 4. Develop ability to apply the Values and State policy enshrined in the Constitution in national life.

Name of the Programme : UG General Education Programmes
Course Code : VAC-105
Title of the Course : Elections and Electoral Management in India
Number of Credits : 2
Effective from AY : 2023-24

Pre-requisites for the Course:	Nil	
Course Objectives:	1. Introduction to Election processes and electoral Management in India and its role in a strong democracy. 2. Familiarisation with the working of the Electoral Machinery 3. Inculcating the importance of voters' informed choice.	
Content:	**Module 1**: Role and Importance of Elections in Indian Democracy: Evolution of Elections in India, Structures and Functions of Election Commission of India and State Election Commissions, Electoral Machinery at Local Level: District Electoral Officer, Observers, Booth Level Officers, Polling Officer, Model Code of Conduct	**15 hours**
	Module 2: Ethical issues in Electoral practices and Challenges: THE Representation Of The People Act, 1950, Guidelines for conduct of elections, Challenges of implementation	**15 hours**
Pedagogy:	Lectures, Group Discussion and case studies	
References/ Readings:	1. Chopra Kumar,(1989), *Politics of Election Reforms in India*, Delhi, Mittal Publication. 2. Devasahayam, M.G (2022), *Electoral Democracy?: An Inquiry into the Fairness and Integrity of Election in India*, Paranjoy. 3. Norris, Pippa and Nai, Alessandro, (Ed), (2017), *Election Watchdogs*, New York, OUP. 4. Norris, Pippa, (2014*), Why Electoral Integrity Matters*?, New York, Cambridge University press. 5. Rajendra Vora and Palshikar Suhas, (2004), *Indian Democracy: Meanings and Practices*, New Delhi, Sage 6. RobinAge, (2019), *Elections in India: Everything You Need to know*, Harper Collins Publishers 7. Shambhunath, (2021), *Elections in India: Procedure and Processes*, Notion Press. 8. Singh, Ujjwal and Roy, Anupama, (2019), *Election Commission of India: Institutionalising Uncertainties*, New Delhi, OUP	
Course Outcomes:	Student will: 1. Understand the working of India's complex electoral process 2. Know the key elements of election machinery in India	

	3. Understand the complexities and the solutions thereof that are available on voting day. 4. Empowered to play an active citizen's role in the election process

Name of the Programme : UG
Course Code : VAC-106
Title of the Course : NCC (Army) 1
Number of Credits : 02 (Hours 15L+0T+30P)(1T+1P)
Effective from AY : 2023-24

Pre-requisites for the Course:	Nil	
Course Objectives :	Groom the youth of the country into disciplined, responsible and patriotic citizens.	
Content	**Module I Theory** NCC General, National Integration and Awareness, Personality Development, Social Service and Community Development	**15 hours**
	Module II- Practical Drill, Field Craft & Battle, Craft, Map Reading, Weapon Training, Communication, Social Service and Community Development	**30 hours**
Pedagogy:	Lectures and Practical applications	
References/ Readings	1. Common Handbook : Common Subject SD / SW 2. Army Army NCC Cadet Handbook Specialised Subject SD/SW	
Course Outcomes :	The course will: 1. Inculcate a spirit of adventure, explorative inquisitiveness, 2. Develop stamina, endurance, discipline, courage, determination, comradeship, 3. Develop leadership leading to development of self-confidence, team spirit and spirit-de- corps amongst NCC cadets	

Name of the Programme : **UG General Education Programmes**
Course Code : **VAC-120**
Title of the Course : **NCC (Army) 2**
Number of Credits : **02 (Hours 15L+0T+30P)**
Effective from AY : **2023-24**

Pre-requisites for the Course:	Nil	
Course Objectives :	Groom the youth of the country into disciplined, responsible and patriotic citizens.	
Content	**Module I Theory** Personality Development, Leadership, Social Service and Community Development	**15 hours**
	Module II- Practical Drill, Field Craft & Battle, Craft, Map Reading, Weapon Training, Communication, Social Service and Community Development	**30 hours**
Pedagogy:	Lectures and Practical applications	
References/ Readings	1. Common Handbook: Common Subject SD / SW 2. Army Army NCC Cadet Handbook Specialised Subject SD/SW	
Course Outcomes :	The course will: 1. Inculcate a spirit of adventure, explorative inquisitiveness, 2. Develop stamina, endurance, discipline, courage, determination, comradeship, 3. Develop leadership leading to development of self-confidence, team spirit and spirit-de- corps amongst NCC cadets	

Name of the Programme : UG
Course Code : VAC-107
Title of the Course : NCC (Navy) 1
Number of Credits : 02 (Hours 15L+0T+30P)
Effective from AY : 2023-24

Pre-requisites for the Course:	Nil	
Course Objectives:	Groom the youth of the country into disciplined, responsible and patriotic citzens.	
Content	**Module I Theory** NCC General, National Integration and Awareness, Personality Development, Social Service and Community Development	**15 hours**
	Module II Practical Drill, Weapon Training, Social Service and Community Development Naval Communication, Seamanship, Swimming	**30 hours**
Pedagogy:	Lectures and Practical applications	
References/ Readings	1. Common Handbook: Common Subject SD / SW 2. Navy NCC Cadet Handbook Specialised Subject SD/SW	
Course Outcomes :	The course will: 1. Inculcate a spirit of adventure, explorative inquisitiveness, 2. Develop stamina, endurance, discipline, courage, determination, comradeship, 3. Develop leadership leading to development of self-confidence, team spirit and spirit-de- corps amongst NCC cadets	

Name of the Programme : UG General Education Programmes
Course Code : VAC-121
Title of the Course : NCC (Navy) 2
Number of Credits : 02 (Hours 15L+0T+30P)
Effective from AY : 2023-24

Pre-requisites for the Course:	Nil	
Course Objectives :	Groom the youth of the country into disciplined, responsible and patriotic citizens.	
Content	**Module I Theory** Personality Development, Leadership, Social Service and Community Development	**15 hours**
	Module II- Practical Drill, Weapon Training, Social Service and Community Development Navigation, Ship & Boat Modelling, Swimming	**30 hours**
Pedagogy:	Lectures and Practical applications	
References/ Readings	1. Common Handbook : Common Subject SD / SW 2. Navy NCC Cadet Handbook Specialised Subject SD/SW	
Course Outcomes :	The course will: 3. Inculcate a spirit of adventure, explorative inquisitiveness, 4. Develop stamina, endurance, discipline, courage, determination, comradeship, 5. Develop leadership leading to development of self-confidence, team spirit and spirit-de- corps amongst NCC cadets	

Name of the Programme : **UG General Education Programmes**
Course Code : **VAC-108**
Title of the Course : **Introduction to the Folktales of India**
Number of Credits : **02**
Effective from AY : **2023-24**

Pre-requisites for the Course	Nil	
Course Objectives:	1. To analyze the cultural and historical context in which Indian folktales were created and transmitted 2. To demonstrate an understanding of the diversity and richness of Indian folklore 3. To appreciate the aesthetic and literary qualities of Indian folktales	
Content:	**Unit 1: Theory** 1. An overview of the key concepts and methods used in the study of folktales, such as genre, motif, variant, and performance 2. An exploration of the different modes of performance and storytelling in Indian folklore, including oral traditions, written texts, and visual representations 3. Interpretation and meaning of the multiple meanings and interpretations of Indian folktales, including their relationship to Indian cultural values, beliefs, and practices	**15 hours**
	Unit 2: Folktales 1. "A Story and a Song" (The relationship between storytelling and cultural identity) 2. "The Adventures of a Disobedient Prince" (Themes of rebellion, disobedience, and self-discovery) 3. "A Buffalo without Bones" (The relationship between animals and humans in folklore) 4. "Why the Sky went up" (The creation of the world and natural phenomena in Indian folklore) 5. "Three Magic Objects" (The symbolism and significance of magical objects in folklore) 6. "Sister Crow and Sister Sparrow" (The importance of compassion and kindness) 7. "The Pomegranate Queen" (The symbolism and significance of plants and fruits in folklore)	**15 hours**
Pedagogy:	A combination of lecture-based instruction, group discussions, reading and analysis of folktales, and potentially creative assignments such as retelling or adaptation of folktales	
References/ Readings:	**Primary Source:** 1. Ramanujan, Attipat K., Stuart H. Blackburn, and Alan Dundes. *A Flowering Tree and Other Oral Tales from India: AK Ramanujan;*	

	Edited with a Preface by Stuart Blackburn and Alan Dundes. Univ of California Press, 1997. **Secondary Sources:** 2. Beck, Brenda E.F. *Folktales of India*. Motilal Banarsidass Publishers, 2001. 3. Chakraverty, Anjan. *The Magic of Indian Miniatures*. Roli Books, 2001. 4. Mahajan, Urmila. *The Puffin Book of Folktales from India*. Puffin Books, 2004. 5. Nath, Pratibha. *Indian Folktales and Legends*. Penguin Random House India, 2015. 6. Paik, Prasanta Kumar. *Indian Folklore: An Introduction* McFarland &Company, 2006. 7. Ramanujan, A.K. *Folktales of India*. Penguin Books, 1994.
Course Outcomes	After the completion of the course, the students will be able to: 1. Identify and analyse the key features and characteristics of folktales 2. Critically evaluate the role of folktales in shaping cultural identities, beliefs, and values 3. Demonstrate an appreciation for the diversity and richness of global folktales, and develop a deeper understanding of different cultures and traditions 4. Apply their knowledge and skills to create their own folktales, based on the characteristics and themes of traditional tales, and share them with others

Name of the Programme : UG General Education Programmes
Course Code : VAC-109
Title of the Course : Indian Economic Thought
Number of Credits : 02
Effective from AY : 2023-24

Pre-requisites for the Course	Nil	
Course Objectives:	1. To facilitate the economic thought in ancient India. 2. To familiarise students with the contribution of Indian Economic Thinkers and the relevance of their contribution.	
Content	**Module I: Economic Thought in Ancient India** Kautilya's Asthashastra: The economic functions of the State Wealth, Taxation and Pricing Policy, the Land System, Trade.	**15 hours**
	Module II: Economic Thought at the time of Independence (i) Dadabhai Naoroji – his Drain Theory, his views on the British Policy of Public Finance and Financial Administration. (ii) Mahadev Govind Ranade – his views on laissez-faire policy and protectionism. (iii) Romesh Chandra Dutt – causes of Indian Poverty, his measures for the removal of poverty in India. (iv) Gopal Krishna Gokhale – his views on public expenditure policy of the British – India Government. (v) Sir. M. Visveswaraya – his views on industrialisation and planned development of India. (vi) Mohandas Karamchand Gandhi – his views on village swaraj, swadeshi, use of machinery, the doctrine of trusteeship. (vii) Dr. B.R. Ambedkar – his views on currency money.	**15 hours**
Pedagogy:	Group Discussion, Class room Presentation, Case Studies, Quiz, Short Assignment.	
References/ Readings:	**Core reading** 1. R. N. Ghosh and Rama Ghosh, Concise History of Economic Thought. Himalaya Publishing House, 1999. 2. Ajit Dasgupta, A Historty of Indian Economic Thought, Routledge history of economic thought series, 1993 [E-book] Available: Taylor & Francis e-Library, 2002	
Course Outcomes:	1. To learn and discuss, how the economic thought has evolved over time. 2. To introduce & highlight before the students about Indian Economic Thinkers and their valuable contribution in the field of Economics. 3. Introducing students to the critical comparison of the contributions of the Indian Thinkers.	

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Name of the Programme : **UG General Education Programmes**
Course Code : **VAC-122**
Title of the Course : **Vedic Mathematics**
Number of Credits : **02 (T)**
Effective from AY : **2025-26**

Pre-requisites for the Course:	Nil	
Course Objectives:	To make students understand the Vedic sutras for arithmetic and algebraic calculations.	
Content	**Unit I Vedic Sutras for Arithmetic Calculations-1:** Introduction to Vedic Mathematics and its 16 sutras and 13 sub-sutras. Addition using the sutras *Purna puranabhyam, Sankalan Vyavkalanabhyam* and *Ekadhikena Purvena*. Subtraction using the sutras *Nikhilam Navatascaramam Dastatah* and *Vinculum* method, Digit separator method. Multiplication using *Nikhilam Navatascaramam Dastatah*, *Urdhva-Tiryagbhyam* method. Multiplication in special cases by using *Antyayordashakepi, Antyayoshatakepi, Vamanlvavoh Dasake Api, Ekanyunena Purvena.* Multiplication by special numbers like 11, 111, 1111, 5, 25, 50, 125, 625.	**15 hours**
	Unit II Vedic Sutras for Arithmetic Calculations – II: Division using the *Nikhilam* method, *Paravartya* Yojyet method and *Urdhva-Tiryagbhyam* method. Finding square using *Ekadhikena purvena,* Duplex method and square roots using *Vilokanam* method. Finding cube using *Yavadunam* method, Anurupyen method and cube roots by *Vilokanam* method. Multiplying two polynomials using *Urdhva-Tiryagbhyam* method. Solving quadratic equations using *Vilokanam* method and *Shunyam Sama samuchchaye* method.	**15 hours**
Pedagogy:	Lectures/Problem Solving/Self-study/ E-resources	
References/ Readings:	**Essential Text:** 1. Rajesh Kumar Thakur, *The Essentials of Vedic Mathematics*, Rupa Publications, New Delhi, 2013. **References:** 1. Atul Gupta, *The Power of Vedic Maths with Trigonometry*, Jaico Publishing House, Mumbai, 2011.	

	2. Dhaval Bathia, *Vedic Mathematics Made Easy*, Jaico Publishing House, Mumbai, 2010. 3. Rajesh Kumar Thakur, *Advanced Vedic Mathematics*, Rupa Publications, New Delhi, 2019. 4. Sri Bharati Krishna Tirthaji, *Vedic Mathematics*, Motilal Banarasidass, New Delhi, 1965.
Course Outcomes:	The student will be able to, 1. Understand fundamental Vedic sutras for arithmetic operations. 2. Demonstrate Vedic multiplication and division techniques for efficient calculation. 3. Apply Vedic sutras to accurately determine square, square roots, cube and cube roots. 4. Develop Skills in Vedic Mathematics for polynomial multiplication and quadratic equations.

C. Digital & Technological Solutions

Name of the Programme : UG General Education Programmes
Course Code : VAC-110
Title of the Course : Awareness of Cyber Crimes and Security
Number of Credits : 02
Effective from AY : 2023-24

Pre-requisites for the Course	Nil	
Course Objectives:	This course is intended to: 1. Introduce to students the awareness of cybercrimes and cyber security – concepts, theory. 2. Covers various techniques which enable the student to analyse the threats and attacks due to cybercrimes. 3. Explains mitigation techniques and policies for cyber security.	
Content:	**Unit 1: Cyber Crime against Individuals and Organisations** Cyber Crime- Overview, Internal and External Attacks, Attack Vectors. Cybercrimes against Individuals – E-mail spoofing and online frauds, Phishing and its forms, Spamming, Cyber-defamation, Cyberstalking, Cyber Bullying and harassment, Computer Sabotage, Pornographic offenses, Password Sniffing. Keyloggers and Screen loggers**.** Cyber Crimes against Women and Children. Cybercrime against organization – Unauthorized access of computer, Password Sniffing, Denial-of-service (DOS) attack, Backdoors and Malwares and its types, E-mail Bombing, Salami Attack, Software Piracy, Industrial Espionage, Intruder attacks. Security policies violations, Crimes related to Social Media, ATM, Online and Banking Frauds. Intellectual Property Frauds. Cyber Crimes against Women and Children.	**15 hours**
	Unit 2: Global perspective on Cyber crimes and Cyber Security A global perspective on cybercrimes, Phases of cyber-attack – Reconnaissance, Passive Attacks, Active Attacks, Scanning, Gaining Access, Maintaining Access, Lateral movement and Covering Tracks. Detection Avoidance, Types of Attack vectors, Zero-day attack, Overview of Network based attacks. Introduction to Cyber Security. Confidentiality, Integrity and Availability – Triad. Attacks: Threats, Vulnerabilities and Risk. Risk Management, Risk Assessment and Analysis. Information Classification, Policies, Standards, Procedure and Guidelines. Controls: Physical, Logical and Administrative; Security Frameworks, Defence in-depth: Layers of security. Identification	**15 hours**

	and Authentication – Factors. Authorization and Access Controls- Models, Methods and Types of Access Control.	
Pedagogy:	Lectures/Tutorial	
References/ Readings:	1. Godbole Nina and Belapore Sunit; "Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Wiley Publications,2011. 2. Jain Atul; "Cyber Crime: Issues, Threats and Management", 2004 3. Yar Majid; "Cybercrime and Society", Sage Publications, 2006 4. Whiteman Michael E and Mattord Herbert J; "Principles of Information Security", Vikas Publishing House, New Delhi, 2003. 5. Matt Bishop, "Computer Security Art and Science", Pearson/PHI, 2002. 6. Indian Institute of Banking & Finance *Prevention Of Cyber Crimes And Fraud Management* Macmillan, Delhi, 2020 7. Prashant Mali *Cyber Law & Cyber Crimes Simplified,* Cyberinfo Media, Delhi, 2017 8. Vishwanath Paranjape *Cyber Crimes and Law*, Central Law Agency, Allahabad, 2019	
Course Outcomes	Students will, 1. Aware of the various cybercrimes and will able to guide others. 2. Understand the global problems faced by individuals, organisations due to cybercrimes and attacks. 3. Apply the cyber security analysis to mitigate and prevent such attacks.	

Name of the Programme : UG General Education Programmes
Course Code : VAC-111
Title of the Course : E-Waste Management
Number of Credits : 02
Effective from AY : 2023-24

Pre-requisites for the Course	Nil	
Course Objectives:	This course is intended to: 1. Introduce to students with the scenario of E-waste. 2. Understand key terms associated with E- waste. 3. To impart life skills about E waste management in routine daily life to minimize the hazards. 4. Create awareness of the regulations related to E-waste to contribute in effective management throughout the society	
Content:	**Unit 1: Introduction to E-waste** Introduction. E- waste; composition and generation. Global context in e- waste; Growth of Electrical and Electronics industry in India, E-waste generation in India, E-waste pollutants, E waste hazardous properties, Effects of pollutant (E- waste) on human health and surrounding environment, domestic e-waste disposal. Essential factors in global waste trade economy, Waste trading as a quint essential part of electronic recycling, Free trade agreements as a means of waste trading. Import of hazardous e-waste in India; India's stand on liberalizing import rules, E-waste economy in the organized and unorganized sector. Estimation and recycling of e-waste in metro cities of India. E-waste control measures:Need for stringent health safeguards and environmental protection laws in India, Extended Producers Responsibility (EPR), Import of e-waste permissions, Producer-Public-Government cooperation, Administrative Controls & Engineering controls, monitoring of compliance of Rules, Effective regulatory mechanism strengthened by manpower and technical expertise, Reduction of waste at source.	**15 hours**
	Unit 2: E-waste Management Basic principles of E waste management, Component of E waste management, Technologies for recovery of resources from electronic waste: Recycling and recovery technologies – resource recovery potential of e-waste, steps in recycling and recovery of materials-mechanical processing, technologies for	**15 hours**

	recovery of materials, occupational and environmental health perspectives of recycling e-waste in India.	
Pedagogy:	Lectures/Experiential Learning	
References/ Readings	1. Johri R., E-waste: implications, regulations, and management in India and current global best practices, TERI Press, New Delhi ,2008 2. Fowler B, Electronic Waste, Elsevier, 2017 3. Bhagat-Ganguly, VarshaE-Waste Management: Challenges and Opportunities in India,Routledge, New Delhi, 2021 4. Nautiyal, Navtika Singh and ShuchitaAgarwal (ed) Future of e-Waste Management: Challenges and Opportunities, Thomson Reuters, 2021. ISBN 13: 978-9390529858	
Course Outcomes	Students will, be able to 1. Understand the environmental impacts of e-waste. 2. Describe the process recycling of e-waste. 3. Distinguish the role of various national and internal act and laws applicable for e-waste management and handling. 4. Analyse the e – waste management measures proposed under national and global legislations.	

Name of the Programme : **UG General Education Programmes**
Course Code : **VAC-112**
Title of the Course : **Green Energy Systems**
Number of Credits : **02**
Effective from AY : **2023-24**

Pre-requisites for the Course	Nil	
Course Objectives:	1. To demonstrate the importance of solar energy collection and storage. 2. To understand the principles of wind energy and biomass energy. 3. To gain knowledge on geothermal and ocean energy. 4. To gain knowledge on geothermal and ocean energy. 5. To understand the concepts of green manufacturing systems.	
Content:	**Unit I Solar, Wind and Biomass Energy** Solar (10 hours) **SOLAR RADIATION**: Role and potential of new and renewable sources, the solar energy option, Environmental impact of solar power, structure of the sun, the solar constant, sun-earth relationships, coordinate systems and coordinates of the sun, extra-terrestrial and terrestrial solar radiation, solar radiation on titled surface, instruments for measuring solar radiation and sun shine, solar radiation data, numerical problems. Photo voltaic energy conversion – types of PV cells. **SOLAR ENERGY COLLECTION:** Flat plate and concentrating collectors, classification of concentrating collectors, orientation. SOLAR ENERGY STORAGE AND APPLICATIONS: Different methods, sensible, latent heat and stratified storage, solar ponds, solar applications- solar heating/cooling technique, solar distillation and drying, solar cookers, central power tower concept and solar chimney. Wind and Biomas (5 hours) **WIND ENERGY**: Sources and potentials, horizontal and vertical axis windmills, performance characteristics, betz criteria, types of winds, wind data measurement. **BIO-MASS**: Principles of bio-conversion, anaerobic/aerobic digestion, types of bio-gas digesters, gas yield, utilization for cooking, bio fuels, I.C. engine operation and economic aspects.	**15 hours**
	Unit II **Geothermal And Ocean Energy, Energy Efecient Systems, And Green Manufacturing Systems** GEOTHERMAL ENERGY: Resources, types of wells, methods of harnessing the energy.	**15 Hours**

	OCEAN ENERGY: OTEC, Principles of utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques. (A) ELECTRICAL SYSTEMS: Energy efficient motors, energy efficient lighting and control, selection of luminaire, variable voltage variable frequency drives (adjustable speed drives), controls for HVAC (heating, ventilation, and air conditioning), demand site management. (B) MECHANICAL SYSTEMS: Fuel cells- principle, thermodynamic aspects, selection of fuels & working of various types of fuel cells, environmentally friendly and Energy efficient compressors and pumps. Environmental impact of the current manufacturing practices and systems, benefits of green manufacturing systems, selection of recyclable and environment friendly materials in manufacturing, design and implementation of efficient and sustainable green production systems with examples like environmentally friendly machining, vegetable based cutting fluids, alternate casting and joining techniques, zero waste manufacturing.	
Pedagogy:	Lectures/Experiential Learning	
References/ Readings:	1. Sukhatme S.P. and Nayak J.K. *Solar Energy – Principles of Thermal Collection and Storage*, Tata McGraw Hill,1984. 2. Khan B.H ,*Non-Conventional Energy Resources*, Tata McGraw Hill, New Delhi, 2006. 3. Paulo Davim J. , *Green Manufacturing Processes and Systems*, Springer 2013. 4. K.S Jagadeesh, B.V Venkata Rama Reddy and K.S Nanjunda Rao *Alternative Building Materials and Technologies* 2nd edition,New Age International,2017. 5. D.Yogi Goswami, Frank Krieth & John F Kreider *Principles of Solar Engineering*,4th edition,Taylor & Francis, 2022.	
Course Outcomes	Students will, 1. Explain the importance of solar energy collection and storage 2. Apply the principles of wind energy and biomass energy. 3. Analyse knowledge on geothermal and ocean energy. 4. Learn about energy efficient systems. 5. Discuss the concepts of green manufacturing systems	

Name of the Programme: UG General Education Programmes
Course Code: VAC-113
Title of Course: Medical Gadgets for Health Care
Number of Credits: 02
Effective from AY: 2023-24

Pre-requisites for the Course	Nil	
Course Objectives:	This course is intended to: • Understand fundamentals concepts of Medical Gadgets & Instrumentation. • Study and analyse various Physiological measurement related transducers. • Understand the different medical gadgets for health care.	
Content:	**Unit I Fundamentals of Medical Instrumentation** Physiological Systems of the Body: Cardiovascular System, Respiratory System, Nervous system. Role of Technology in Medicine: Sources of Biomedical Signals, Basic Medical Instrumentation System, Performance Requirements of Medical Instrumentation Systems, Intelligent Medical Instrumentation Systems, Consumer and Portable Medical Equipment, Wireless Connectivity in Medical Instruments, General Constraints in Design of Medical Instrumentation Systems. **Physiological transducers:** Introduction, Classification of Transducers, performance characteristics of Transducers: static and dynamic characteristics, signals from cardiovascular system, signals from respiratory system and the various types of transducers required to measure a given parameter, Optical fibre sensors: types of optical fibre sensors, Biosensors, Smart sensors.	**15 Hours**
	Unit II Medical Gadgets for Health Care Home health monitor, Description, Function, Working and how to use, readings: ECG Monitor, Blood Pressure Machine, Pulse Oximeter, Thermometer, A contactless IR thermometer, Pedometers, Body Mass Index, Stethoscope, Spirometer, Glucometer, UV Sterilizer, Oxygen concentrator, Nebulizer machine.	**15 Hours**
Pedagogy:	Lectures/Tutorial Learning	
References/ Readings:	1. Khandpur R.S *Handbook of Biomedical Instrumentation*, 3rd Edn, Tata McGraw Hill, New Delhi, 2014	

	2. Webster John and A.J. Nimunker *Medical Instrumentation- Application & Design*, 4th Edition, Wiley India, 2021 . 3. Cromwell Leslie, Weibell Fred J., Pfeiffer Erich A. *Biomedical Instrumentation and Measurements*, 2nd Edition, Pearson IN, Delhi, 2015. 4. Chatterjee, S. and A. Miller, *Biomedical Instrumentation Systems*, Cengage Publications, New Delhi 2013
Course Outcomes	Students will, 1. Gains knowledge about various medical gadgets. 2. Understand the working principles of the gadget & instruments. 3. Hands on experience in using various medical gadgets.

D. Health & Wellness, Yoga Education, Sports & Fitness

Name of the Programme : UG General Education Programmes
Course Code : VAC–114
Title of the Course : Health and Wellness
Number of Credits : 02
Effective from AY : 2023-24

Prerequisites for the Course	Nil	
Course Objectives:	1. To introduce the student to the models and dimensions of health and wellness. 2. To familiarize students with lifestyle diseases and the need for lifestyle changes. 3. To understand the nature of mental health and stress and its management. 4. To enable students to manage their health and wellness via healthy eating, physical fitness and rational decision making.	
Content:	**Unit 1: Introduction to Health and Wellness** • Meaning: Models of Health - Medical and Wellness; Dimensions of Health and Wellness; Measuring Health. • Lifestyle diseases; Making Lifestyle Changes: Health Belief Model, Trans-theoretical Model, Theory of Reasoned Action. • Mental Health and Stress: Thoughts, Emotions, and Mental Health; Stress: Components and Management.	**15 hours**
	Unit 2: Health and Wellness Management • Healthy Eating: Components of Food; Dietary Guidelines for Eating Right; Sensible Weight Management. • Physical Activity for Health: Components and Benefits. • Making Decisions about Health Care: Being a wise Healthcare Consumer; Choosing a Healthcare Provider; Health Insurance.	**15 hours**
Pedagogy:	Lectures/Case analysis/Assignments/Classroom interactions	
References/ Readings:	**Main Textbook** 1. G. Edlin and E. Golanty, Health & Wellness, 13th ed. United States of America: Jones & Bartlett Learning, 2019. **Suggested References** 2. S. Anil, Ed., Healthful Eating As Lifestyle (HEAL): Integrative Prevention for Non-Communicable Diseases. Boca Raton: CRC Press Taylor & Francis Group, 2017. 3. E. Hardman and D. J. Stensel, D. J., Physical Activity and Health: The Evidence Explained, 2nd ed. London and New York: Routledge, Taylor & Francis Group, 2009. 4. K. L. Harkness and E. P. Hayden, Eds., The Oxford Handbook of Stress and Mental Health. New York: Oxford University Press, 2020. 5. Human Kinetics, Health and Wellness for Life. Health Textbooks. United States of America: Human Kinetics, Inc., 2010. 6. D. C. Wood, The Economics of Health and Wellness: Anthropological Perspectives, Research in Economic Anthropology, Vol. 26. United Kingdom: Elsevier Ltd., 2008.	

Course Outcomes:	Upon completion of this course, the student will be able to: 1. Comprehend the models and dimensions of Health and Wellness. 2. Understand the prevalence of Lifestyle diseases and the urgency for change. 3. Analyze the nature of Mental Health and Stress and ways to manage the same. 4. Elucidate on Management of Health and Wellness through mechanisms of Nutrition, Fitness and Rational decisions.

Name of the Programme : UG General Education Programmes
Course Code : VAC-115
Title of the Course : Yoga and Ayurveda
Number of Credits : 02
Effective from AY : 2023-24

Pre-requisites for the Course:	Nil	
Course Objectives:	1. To promote healthy lifestyles through traditional knowledge of yoga. 2. To provide exposure to the ayurvedic concepts dealing with wellness.	
Content:	**Unit I: Introduction to Patanjali's Yoga** 1. Meaning, Citta-Bhumi, Citta-vrtti, Aims and Objectives: Citta-Vrtti-Nirodha, Aṣṭāñga Yoga 2. Four Paths of Yoga – Karma yoga, Bhakti yoga, Raja yoga, Jnana yoga 3. Yoga for healthy living: Benefits of yoga 4. Yoga and its relevance in modern times; popular types of yoga today 5. Traditional v/s modern yoga	**15 hours**
	Unit II: Practices in Ayurveda and Wellness 1. Theories and key concepts in Ayurveda. 2. Nature of – man, mind and consciousness 3. Scientific methodology in Ayurveda 4. Practices in Ayurveda – Samskaras, Holistic approaches in ayurvedic practices 5. Dinacharya, Ratricharya, Rtucharya 6. Practices regarding treatment stages in Ayurveda	**15 hours**
Pedagogy:		
References/ Readings:	1. Chatterjee, Satish Chandra and Dheerendra Mohan Datta: An Introduction to Indian Philosophy, New Delhi: Rupa Publications, 2007. 2. Vivekananda, Swami: The Complete Works of Yoga: Karma Yoga, Bhakti Yoga, Raja Yoga, and Jnana Yoga, New Delhi: Prakash Books India Pvt. Ltd., 2019. 3. Rao, Ramakrishna, Anand C. Paranjape,and Ajit K. Dalal (Ed.), Handbook of 4. Indian Psychology, New Delhi: Cambridge University Press, 2009. 5. Murthy, K.R. Srikantha: Vagbhata's 'Aṣṭāñga Hṛdayam', Varanasi: Chowkhambha Krishnadas Academy, 2020. 6. Rana, Jitendra Kumar: "Role of Dincharya and Ratricharya Regimen towards Promotion of Positive Health," *International Journal of Pharmaceutical Research and Applications,* Vol. 6, Issue 2, 2021.	

Name of the Programme : **UG General Education Programmes**
Course Code : **VAC-116**
Title of the Course : **Life Skills**
Number of Credits : **02**
Effective from AY : **2023-24**

Pre-requisites for the Course	Nil	
Course Objectives:	1. To introduce the students to life skills 2. To understand the connection between emotional, social and thinking skills 3. To train the students in conducting life skills workshop with various stakeholders 4. To develop critical and creative thinking skills	
	Module 1: Need and Importance of Life Skills Education a. Introduction to the Concept of Life Skills b. Benefits and application of Life Skills. c. Matching Life Skills with one's behaviour. d. Components of Life Skills (Social- Thinking-Emotional) e. Understanding oneself in the world around: Discovering and Understanding the Inner-Self, Exploring One's Self Identity, Staying in tune with Self, Self Esteem. f. Managing one's emotions/ feelings- Identifying common emotions.	**15 hours**
Content:	**Module 2: Social Skills** a. Interpersonal Relationships- Web of Relationships, Family and Friendships, Healthy Relationships, Resistance to Peer Pressure, Transactions with people around us (Negotiation), Assertiveness. b. Effective Communication- Verbal and Non-Verbal communication (body language) Talking, Hearing vs Listening, Clarity and Optimal communication. c. Empathy- Understanding of other people's circumstances, Extending support to others. d. Coping with Stress- Sources of stress, Coping Strategies.	**15 hours**
Pedagogy:	Lectures/power point presentation/assignments/ games/ films and discussion/ group readings and discussions/ presentations/	
References/ Readings:	1. Central Board of Secondary Education (2010). Teacher's manual on Life Skills for classes – IXX [Manual], Delhi 2. Cottrell, S. (2005). Critical thinking skills: Developing effective analysis and argument. New York: Palgrave Macmillan Ltd.	

	3. Karen, D. G., & Eastwood A. (2008). (8thEdn.), Psychology for living-adjustment, growth and behaviour today, New Delhi: Pearson Education Inc. 4. McGregor, D. (2007). Developing thinking; developing learning - A guide to thinking skills in education. New York, USA: Open University Press.
Course Outcomes:	1. Students will be introduced to important Life Skills: Emotional, Social, Critical thinking, and Creative thinking. 2. Students will understand the connection between emotional, social and thinking skills. 3. Students will be able to understand the use of these skills and be able to use them in their own personal lives as well as in the helping profession. 4. Students will develop their critical and creative thinking skills.

Name of the Programme : **UG General Education Programmes**
Course Code : **VAC-117**
Title of the Course : **Youth Empowerment using Mind Management**
Number of Credits : **2**
Effective from AY : **2023-24**

Pre-requisites for the Course	Should not have had any major Health Issues, to be ascertained by the Teacher before the commencement of the course	
Course Objectives:	1. To understand the relationship between the rhythms of our breath and our emotional state. 2. To understand the fundamentals of how the mind works, the tendencies and habits of the mind, the relationship between our state of mind and happiness. 3. To learn how to quieten the mind to increase focus and mental clarity by practice of the Healing Breath technique (SudarshanKriya) and the practice of light Yoga.	
Content:	The Seven Levels of our existence - Body, Breathe, Mind, Intellect,Memory, Ego and Self. Sources of Energy - Prana and the Breath; Food: Types of Food and Its Effect; Sleep and Its Effect on the Body/Mind Complex.	**3 hours**
	Bringing the Mind to the Present - Practical knowledge to eliminate counterproductive activity; Discussion of tendencies of the mind, including worry, regret and aversion. Learn how to use practices to overcome negative mental habits (i.e. complaining, gossiping) and strengthen positive mental qualities (i.e. focus and commitment). How to enhance learning ability; techniques and interactive processes to improve memory, concentration & focus.	**6 hours**
	Interpersonal Relations - The Modes of Acceptance – People, Situations; The Complementary Nature of Opposite Values. Roles in Life, Responsibility, Service – Impacting our Communities and the World;	**3 hours**
	Discussion of the qualities of a leader – giving 100%, responding to the needs of a situation, and maintaining enthusiasm. Sudarshan Kriya for restoring the rhythm in breathe to overcome stress and increase the energy levels	**6 hours**
	A Community Engagement Mini-Project/Internship addressing any problem under the themes of – Health and Hygiene, Waste Management, Water Management, Energy Management, and Greenery in any Village of Goa	**12 hours**
Pedagogy:	Group Activities, Experiential learning using simple processes, games,	

	Visits to Villages
References/ Readings:	Resource Material/Manual of Art of Living Foundation, Bangalore for YES+ Programme
Course Outcomes:	1. Students will become aware of their way of communication and will improvise by practice their confidence and communication skills. 2. Students will understand how their own emotions are tied to the breath and nervous system. They will experience how the Sudarshan Kriya™ affects emotions, memory and overall well-being. 3. Students will understand how to manage their interpersonal relationships with acceptance and improved communication. 4. They will be able to navigate the roles they play in life in a very effective manner

Name of the Programme : UG General Education Programmes
Course Code : VAC-118
Title of the Course : Health and Physical Education
Number of Credits : 2
Effective from AY : 2023-24

Pre-requisites for the Course	Nil	
Course Objectives:	1. Develop an understanding of the relationship among physical activity, fitness, and health and the physiological and psychological benefits of physical activity. 2. Impart knowledge of theoretical foundations of motor development and learning, cognitive and affective dimensions of physical activity, and physical activity interventions for mental health conditions. 3. Make students understand the components of physical fitness, how to measure them, and develop skills in the prescription of physical activity for different populations while also considering safety. 4. Acquire practical skills in a range of exercises including cardiovascular, resistance, core strengthening, flexibility, circuit training, low-intensity interval training, sports and recreational activities, yoga, and Pilates. 5. Develop knowledge of basic nutrition and hydration practices, stress management techniques, injury prevention, and fitness assessment and goal setting. 6. Learn to create personalized fitness plans and understand how to review and adjust them to meet individual goals. 7. Enhance critical thinking and decision-making abilities in selecting appropriate physical activity for individual needs, preferences, and abilities.	
Content:	**Chapter 1: Introduction to Health and Physical Education** ● Defining health and physical education ● The relationship between physical activity, fitness, and health ● The physiological and psychological benefits of physical activity ● The relationship between physical activity and chronic diseases	**5 Hours**
	Chapter 2: Theoretical Foundations of Health and Physical Education ● Understanding the principles of motor development and learning. ● Cognitive and affective dimensions of physical activity. ● Physical activity interventions for mental health conditions ● The role of physical activity in promoting mental health.	**5 Hours**
	Chapter 3: Physical Activity Guidelines and Prescription ● The components of physical fitness and how to measure them	**5 Hours**

- The development of physical activity guidelines and their impact
- Prescription of physical activity for different populations
- Safety considerations in physical activity

Chapter IV Practical Component:

No:	Module	Activities	Hours
1	Warm-up exercises and stretching	Basic warm-up exercises and stretching	**1**
2	Cardiovascular exercises	Jogging, running, cycling, etc.	**1**
3	Resistance training	Weightlifting, bodyweight exercises	**1**
4	Core strengthening exercises	Planks, crunches, leg lifts	**1**
5	Flexibility exercises	Static stretching (Active and Passive)	**1**
6	Circuit training	Circuit-based exercises	**1**
7	Low-intensity interval training (LIIT)	LIIT-based exercises	**1**
8	Sports and recreational activities	Indigenous sports	**1**
9	Yoga and Pranayama	Hath Yoga and Basic Techniques of Pranayama & Meditation	**1**
10	Nutrition and hydration	Basic nutrition guidelines and hydration practices	**1**
11	Mental health and stress management	Basic stress management techniques	**1**

Practical Component 15 Hours

	12	Injury prevention and first aid	Basic injury prevention techniques	**1**
	13	Fitness assessment and goal setting	Basic fitness assessment techniques and goal setting	**1**
	14	Personalized fitness plans	Creation of personalized fitness plans	**2**

Pedagogy:	• Lecture-based teaching • Active learning • Experiential learning • Collaborative learning • Personalized learning • Self-directed learning • Flipped classroom • Project-based learning
References/ Readings:	**Single Author Book** 1. Bean, A. (2008). The Complete Guide to Strength Training (Complete Guides). Bloomsbury Sport. 2. Bompa, T. O. (2018). Periodization: Theory and Methodology of Training. Human Kinetics. 3. Bompa, T. O. (2019). Periodization-6th Edition: Theory and Methodology of Training. Human Kinetics. 4. Delavier, F. (2010). Strength Training Anatomy. Human Kinetics. 5. Foran, B. (2001). High-Performance Sports Conditioning. Human Kinetics. 6. Karpinski, C., & Rosenbloom, C. (2017). Sports Nutrition: A Handbook for Professionals. Academy of Nutrition and Dietetics. 7. Shirl J. Hoffman. (2018) Introduction to Kinesiology: Studying Physical Activity" **Three or More Authors** 1. A.K. Uppal, V.L.G Kumar, M.M Panda. Biomechanical in physical education and exercise science. 2. A.K. Uppal, V.L.G Kumar, M.M Panda. Kinesiology in physical education and exercise science. 3. Mack, G., & Casstevens, D. (2002). Mind Gym: An Athlete's Guide to Inner Excellence. McGraw Hill Professional. **E-books** 1. "Essentials of Strength Training and Conditioning" by National Strength and Conditioning Association

	2. "Health and Physical Education: A Practical Approach for Primary Schools" by Sue Chedzoy. 3. National Strength and Conditioning Association. (2011). NSCA's Essentials of Personal Training. Human Kinetics.
Course Outcomes:	After studying this course, the students will be able to: 1. know the difference and relationship among physical activity, fitness, and health and describe the physiological and psychological benefits of physical activity; 2. analyze the theoretical foundations of motor development and learning, cognitive and affective dimensions of physical activity, and physical activity interventions for mental health conditions; 3. evaluate the components of physical fitness, how to measure them, and develop skills in the prescription of physical activity for different populations while also considering safety; 4. demonstrate practical skills in a range of exercises including cardiovascular, resistance, core strengthening, flexibility, circuit training, low-intensity interval training, sports and recreational activities, yoga, and Pilates; a 5. apply knowledge of basic nutrition and hydration practices, stress management techniques, injury prevention, and fitness assessment and goal setting to promote health and wellness; and 6. develop personalized fitness plans and evaluate and adjust them to meet individual goals.

Name of the Programme : **UG General Education Programmes**
Course Code : **VAC-119**
Title of the Course : **Exercise Science and Nutrition for Fitness**
Number of Credits : **2**
Effective from AY : **2023-24**

Pre-requisites for the Course:	Nil	
Course Objectives:	1. Develop an understanding of the different components of fitness and their importance in overall health and wellness. 2. Gain exposure to a variety of exercise equipment and methods to develop a well-rounded fitness program. 3. Understand the principles of exercise prescription, including intensity, frequency, duration, and progression, to develop personalized fitness plans. 4. Develop proficiency in performing exercises targeting specific muscle groups and fitness components, such as cardiovascular endurance, strength, and agility. 5. Acquire knowledge of proper nutrition and hydration practices to support a healthy and active lifestyle.	
Content:	**Chapter 1: Fundamentals of Personal Fitness Training.** In this chapter, we will cover the fundamental principles of personal fitness training, including: • The components of fitness- cardiovascular endurance, muscular strength, muscular endurance, flexibility, and body composition. • Principles of training - overload, specificity, progression, and individuality. • The energy systems used during exercise and how they relate to training intensity and duration. • How to design and modify exercise programs to meet individual fitness goals • The importance of rest and recovery in achieving fitness goals **Chapter 2: Advanced Concepts in Personal Fitness Training** In this chapter, we will cover more advanced topics in personal fitness training, including: • The role of nutrition in fitness training, including macronutrient and micronutrient requirements for various fitness goals • Training for specific sports or activities, including the importance of specificity and periodization • Techniques for measuring and tracking progress, including body composition analysis and fitness testing. • The psychology of fitness training, including motivation and goal setting.	5 Hours 5 Hours

	Chapter 3: Injury Prevention and Rehabilitation in Personal Fitness Training In this chapter, we will cover injury prevention and rehabilitation in personal fitness training, including: • Common injuries in fitness training and how to prevent them • Techniques for assessing and addressing imbalances and weaknesses that can lead to injuries. • Rehabilitation exercises and techniques for common injuries. • The importance of proper technique and form in preventing injuries. • The use of equipment and gear to prevent injuries	5 Hours
	Chapter 4: This chapter consists of 15 practical sessions, each lasting for 60 minutes (1 Hour). **Session 1: Cardiovascular Endurance and Resistance Band Session** • Warm-up with jump rope and resistance band stretches • 20 minutes of cycling or running on treadmill/to build cardiovascular endurance • Resistance band exercises targeting upper and lower body muscles • Cool-down stretches with resistance band	1 Hour
	Session 2: Bosu Ball and Core Strength Session • Warm-up with Bosu Ball balance exercises • Core strengthening exercises using Bosu Ball and bodyweight exercises • Cool-down with traditional core exercises such as planks and sit-ups	1 Hour
	Session 3: Pilates and Flexibility Session • Warm-up with Pilates breathing exercises and stretches • Pilates mat exercises focusing on improving posture, balance, and flexibility • Advanced stress management techniques, including cognitive-behavioral therapy and mindfulness practices • Cool-down with stretches on exercise ball	1 Hour
	Session 4: Kettlebell and Strength Session • Warm-up with bodyweight exercises • Kettlebell exercises targeting upper and lower body muscles • Cool-down with stretches and foam roller massage	1 Hour
	Session 5: Resistance Band and Cardiovascular Endurance Session • Warm-up with resistance band stretches	1 Hour

	• Cardiovascular endurance exercise such as stair climbing, rowing or swimming • Resistance band exercises targeting upper and lower body muscles • Cool-down with stretches and foam roller massage	1 Hour
	Session 6: Plyometrics and Strength Session • Warm-up with bodyweight exercises and jumping jacks • Plyometric exercises such as box jumps, jump squats, and burpees • Strength exercises targeting upper and lower body muscles using free weights • Cool-down with stretches and foam roller massage	1 Hour
	Session 7: Speed Ladder and Agility Session • Warm-up with dynamic stretching and cone drills • Speed ladder drills targeting agility and coordination • Cool-down with stretching and foam roller massage	1 Hour
	Session 8: Free Weight and Resistance Band Session • Warm-up with resistance band stretches • Strength exercises targeting upper and lower body muscles using free weights • Resistance band exercises targeting upper and lower body muscles • Cool-down with stretches and foam roller massage	1 Hour
	Session 9: Exercise Ball and Balance Session • Warm-up with balance exercises on exercise ball • Exercises targeting core and balance on exercise ball • Cool-down with stretches and foam roller massage	1 Hour
	Session 10: Kettlebell and Plyometrics Session • Warm-up with bodyweight exercises and kettlebell swings • Plyometric exercises such as jump squats and box jumps • Kettlebell exercises targeting upper and lower body muscles • Cool-down with stretches and foam roller massage	1 Hour
	Session 11: Resistance Band and Core Session • Warm-up with resistance band stretches • Core strengthening exercises using resistance band and bodyweight exercises • Cool-down with traditional core exercises such as planks and sit-ups	1 Hour
	Session 12: Speed Ladder and Cardiovascular Endurance Session • Warm-up with dynamic stretching and cone drills • Speed ladder drills targeting agility and coordination	

	• Cardiovascular endurance exercise such as running or cycling • Cool-down with stretching and foam roller massage **Session 13: Free Weight and Strength Session** • Warm-up with bodyweight exercises and stretches • Strength exercises targeting upper and lower body muscles using free weights • Cool-down with stretches and foam roller massage **Session 14: Plyometrics and Cardiovascular Endurance Session** • Warm-up with bodyweight exercises and jumping jacks • Plyometric exercises such as jump squats and burpees • Cardiovascular endurance exercise such as rowing or swimming • Cool-down with stretching and foam roller massage **Session 15: Exercise Ball and Flexibility Session** • Warm-up with exercise ball stretches • Advanced flexibility training on an exercise ball, Proprioceptive Neuromuscular Facilitation (PNF), and stretching techniques for specific muscle groups • Cool-down with stretching and foam roller massage	1 Hour 1 Hour 1 Hour
Pedagogy:	• Lecture-based teaching • Active learning • Experiential learning • Collaborative learning • Personalized learning • Self-directed learning • Flipped classroom • Project-based learning	
References/ Readings:	**Single Author Book** 1. K. Uppal. Science of Sports Training 2. Bean, A. (2008). The Complete Guide to Strength Training (Complete Guides). Bloomsbury Sport. 3. Bompa, T. O. (2018). Periodization: Theory and Methodology of Training. Human Kinetics. 4. Bompa, T. O. (2019). Periodization-6th Edition: Theory and Methodology of Training. Human Kinetics. 5. Campbell, A. (2010). The Women's Health Big Book of Exercises. Rodale Books. 6. Delavier, F. (2010). Strength Training Anatomy. Human Kinetics. 7. Delavier, F. (2010). Strength Training Anatomy. Human Kinetics. 8. Foran, B. (2001). High-Performance Sports Conditioning. Human Kinetics. 9. Isacowitz, R. (2011). Pilates Anatomy. Human Kinetics.	

	10. Maffetone, P. (2010). The Big Book of Endurance Training and Racing. Skyhorse Publishing. 11. Price, R. G. (2004). The Ultimate Guide to Weight Training for Sports. Price World Publishing. 12. Rippetoe, M. (2011). Starting Strength: Basic Barbell Training. The Aasgaard Company. 13. Shirl J. Hoffman. (2018) Introduction to Kinesiology: Studying Physical Activity" 14. Williams, M. H. (2005). Nutrition for Health, Fitness, & Sport. McGraw-Hill. **Two Authors Book** 1. Karpinski, C., & Rosenbloom, C. (2017). Sports Nutrition: A Handbook for Professionals. Academy of Nutrition and Dietetics. 2. Schuler, L., & Cosgrove, A. (2008). The New Rules of Lifting: Six Basic Moves for Maximum Muscle. Avery. 3. Starkey, C., Brown, S., & Starkey, C. (2009). Examination of Orthopedic and Athletic Injuries. F.A. Davis Company. **Three or More Authors** 1. A.K. Uppal, V.L.G Kumar, M.M Panda. Biomechanical in physical education and exercise science. 2. A.K. Uppal, V.L.G Kumar, M.M Panda. Kinesiology in physical education and exercise science. **E-books** 1. "ACSM's Complete Guide to Fitness and Health" by American College of Sports Medicine. 2. "Anatomy of Exercise: A Trainer's Inside Guide to Your Workout" by Pat Manocchia. 3. "Essentials of Strength Training and Conditioning" by National Strength and Conditioning Association.
Course Outcomes:	After completion of the course the students will: 1. Understand different components of fitness and their importance in overall health; 2. Gain exposure to a variety of exercise equipment and methods for a well-rounded fitness program; 3. Understand principles of exercise prescription to develop personalized fitness plans; 4. Develop proficiency in exercises targeting specific muscle groups and fitness components; 5. Acquire knowledge of proper nutrition and hydration practices to support a healthy lifestyle; and 6. Develop critical thinking and problem-solving skills to address barriers to a healthy and active lifestyle.

Name of the Programme : **UG General Education Programmes**
Course Code : **VAC-124**
Title of the Course : **Peace Education Program**
Number of Credits : **2**
Effective from AY : **2026-27**

SWAYAM Plus Portal

Course Link:

https://swayam-plus.swayam2.ac.in/courses/course-details?id=F_TPRF_11