

Multi-Disciplinary Course

based on NEP-2020

SEMESTER-III



(Effective from Session 2025-26)

(Batch: 2025-2028)



SAMBALPUR UNIVERSITY

JYOTI-VIHAR, BURLA, SAMBALPUR, ODISHA-768019

Multi-Disciplinary Course (MDC)

SEMESTER-III

PROGRAMMING ON C++

Credits: 3 Lecture: 45 Hour

Full mark: 100

Subject Teacher: Mathematics/Computer Science

Course Objective:

The objective of the course is to learn the basics about C++ programming language such as variables, data types, arrays, pointers, functions and classes etc. On successful completion this course, students will acquire a good understanding about the concept of object-oriented programming using C++ and be able to write and read basic C++ code.

Learning Outcome: On the completion of this course, students will be able to

- Learn to understand different types of data by C++ language.
- Learn different symbols used in the programming language representing the text variables and constants.
- Learn to develop various operators, loops and nested control statements.
- Learn to generate functions, local and global variables, 1D and 2D array in C++ programme.

UNIT-I

Introduction to structured programming: data types- simple data types, floating data types, character data types, string data types, arithmetic operators and operator's precedence.

UNIT-II

Variables and constant declarations, expressions, input using the extraction operator >> and cin, output using the insertion operator << and cout, preprocessor directives, increment (++) and decrement (--) operations.

UNIT-III

Creating a C++ program, input output, relational operators, logical operators and logical expressions, if and if-else statement, switch and break statements, for, while and do-while loops, continue statement, nested control statement.

UNIT-IV Functions, value returning functions, value versus reference parameters, local and global variables, one dimensional array, two dimensional array, pointer data and pointer variables.

Books Recommended

- *D. S. Malik: C++ Programming Language, Course Technology, Cengage Learning, India Edition, 2009.*
- *E. Balaguruswami: Object oriented programming with C++, fifth edition, Tata Mc Graw Hill Education Pvt. Ltd., 2008*

Books For Reference

- *R. Johnsonbaugh and M. Kalin-Applications Programming in ANSI C, Pearson Education.*
- *S. B. Lippman and J. Lajoie, C++ Primer, 3rd Ed., Addison Wesley, 2000.*
- *Bjarne Stroustrup, The C++ Programming Language, 3rd Ed., Addison Welsley, 2010.*
- *Suggested digital platform: NPTEL/SWAYAM/MOOCs*
- *e-Learning Source <http://ndl.iitkgp.ac.in> ; <http://ocw.mit.edu> ; <http://mathforum.org>*

INTRODUCTION TO SPECTROSCOPY

Credits: 3 Lecture: 45 Hour

Full mark: 100

Subject Teacher: Physics

Course Outcome:

CO- I : Basic understanding of atomic models and its spectroscopy nature

CO-2: Conceptual understanding of Spectra of Alkali elements

CO-3: Understanding the basic of X-ray and its applications

CO-4 : Understanding molecular spectroscopy

UNIT- 1:

Vector Atomic Model: Inadequacies of Bohr and Bohr-Sommerfeld atomic models w.r.t. spectrum of Hydrogen atom (fine structure of H-alpha line). Modification is due to the finite mass of the nucleus and the Deuteron spectrum. Vector atomic model (Stern-Gerlach experiment included) and physical & geometrical interpretations of various quantum numbers for single & many valence electron systems. LS & JJ couplings, spectroscopic notation for energy states, selection rules for transition of electrons and intensity rules for spectral lines. Fine structure of I-I- alpha line based on vector atomic model.

UNIT-11:

Spectra of Alkali & Alkaline Elements: Spectra of alkali elements: Screening constants for s, p, d & f orbitals; sharp, principle, diffuse & fundamental Series; doublet structure of spectra and fine structure of Sodium D line.' Spectra of alkaline elements: Singlet and triplet structure of spectra.

UNIT-111:

X-rays & X-Ray Spectra: Nature & production, Continuous X-ray spectrum & Duane-Hunt's law, Characteristic X-ray spectrum & Mosley's law, Fine structure of Characteristic X-ray spectrum, and X-ray absorption spectrum.

UNIT-IV:

Molecular Spectra: Discrete set of a molecule's electronic, vibrational and rotational energies. Quantization of vibrational energies, transition rules and pure vibrational spectra. Quantization of rotational energies, transition rules, pure rotational spectra and determination of inter nuclear distance. Basics of UV Visible & photoluminescence spectroscopy

Reference Books:

1. H.E. White, " Introduction to Atomic Spectra ", McGraw Hill, 1934 8.
2. C.N. Banwell, E.M. Mc. Cash, " Fundamentals of Molecular Spectroscopy ", Mc. Graw Hill, 2017, 4e 9.
3. R Murugesan, Kiruthiga Sivaprasath, " Modern Physics ", S. Chand Publishing, 2019, 18e 10.
4. S.L. Gupta, V. Kumar, R.C. Sharma, " Elements of Spectroscopy & quot;, Pragati Prakashan, Meerut, 2015, 27

INDIAN KNOWLEDGE SYSTEM

Credits: 3 Lecture: 45 Hour

Full mark: 100

Subject Teacher: History/ Sanskrit

Introduction

While humans have been making progress in the life, it is also a wide-spread understanding that for every new solution and idea that we discover, we introduce more and more challenges and problems arising out of them. This potentially raises the need to look for alternative paradigms for the emerging world order. Indic Knowledge Systems (IKS) can potentially offer ideas for developing new paradigms for the world order. A knowledge of IKS is the first step in this process.

This course includes ideas on fundamental premises related to one's living as laid out in the Vedas, components of knowledge that help us develop a correct understanding of the Vedic literature, *Purāṇas*, *Darśanas*, *Smṛtis*, Upa Vedas and many more. This is typically referred to as *Caturdaśa-vidyāsthānam*. This course outline covers one part of this knowledge tradition and the rest is covered in the second course.

Course Objectives

The course design seeks to address the following issues:

- To introduce to the students about the overall organization of IKS
- To develop an appreciation among the students the role and importance of Veda, Vedāṅgas, Upa Vedas and Purāṇas
- To show case the multi-dimensional nature of IKS and their importance in the contemporary society
- To motivate the students to take up a detailed study of some of these topics and explore their application potential

Course Outcome

The students will be able to -

- Explore the impact of ancient Indian literature on life in modern day society.
- Approach sastric texts systematically while using the methods of interpretation to have a detail idea on the influence of Sanskrit language on different.

Unit-wise topics

Unit- 1: Śruti (Vedas and Upa Vedas)

Topics:

- What is IKS?

- Organization of IKS – चतुर्दशविद्यास्थानम्
- The Vedas as the basis of IKS, It's traditional and modern views
- Brief discussion on broad Divisions of the Veda: (Mantra, Brāhmaṇa, Āraṇyaka, Upaniṣad; Śākhās;)
- Overview of the four Upa Vedas – derived from the four Vedas
- Ayurveda: Science of holistic health, Gleaning from Charaka Samhita and Susruta Samhita
- Dhanurveda: Gleanings from various texts and lessons for modern times - basic information
- Gandharvaveda: Gleanings from Bharata's Nāṭyaśāstra- (Introduce Abhinava Gupta's thoughts on Nṛtya and Sangeeta); Nārādīya śikṣā; Saṅgīta śāstra
- Sthāpatyaveda: Basic information about Iconography, Temple architecture

Unit- 2: Six Vedāṅgas and Smṛtis

Topics:

- The assistive role of the Vedāṅgas in the study of the Veda
- Overview of all the six Vedāṅgas: Essential aspects
- Modern discoveries in ancient works pertaining to the Vedāṅga
- Role of Smṛtis in paving the way for systemizing the life
- Kalpasūtras and the 16 Saṁskaras
- Gleanings from Gautama Dharmasutra, Brihaspati Dharmasutra, Manusmṛti, Yājñavalkyasmṛti
- Arthasastra: A branch of Dharma Śāstra as the treatise on Indian Polity

Unit- 3: Purāṇas and Itihāsas

Topics:

- Purāṇa-Lakṣana (Pañcalakṣaṇa & Daśalakṣaṇa) and categorisations: Purāṇas-Mahāpurāṇas-Upapurāṇas
- Understanding Paurāṇic style by textual study of some portions from Bhāgavata etc. and its contemporary application potential
- Introduction of Itihāsa, Explanation on differences between Purāṇa and Itihāsa
- Narration of Ramāyaṇa and the Mahābhārata and its comparative understanding
- A brief introduction of Bhagavad Gītā focusing on the spiritual input into life

Unit- 4: Darśanas

Topics:

- A broad overview of the darśanas; their founders and differentiation into āstika and nāstika
- Nyāya–Vaiśeṣika: Gleanings from Tarkasaṅgraha
- Sāṅkhya–Yoga: Gleanings from Sāṅkhya-kārikā, Yogasūtra
- Pūrvamīmāṃsā: An overview of the Jaiminisūtras and its contribution in application of hermeneutics.
- Uttaramīmāṃsā: The Vedāntadarśana through the prasthānatreya
- Role of Uttaramīmāṃsā and mīmāṃsākas on shaping the social, philosophical and cultural aspects of India.

Core Reading-

- B. Mahadevan, Nagendra Pavana, Vinayak Rajat Bhat, INTRODUCTION TO INDIAN KNOWLEDGE SYSTEM : CONCEPTS AND APPLICATIONS, PHI Learning , 2022
- Kapil Kapoor, Awadhesh Kumar Singh, Indian Knowledge Systems: Vol. 1& 2, D.K.Print World, 2005

Suggested Readings-

- Swami Harshananda. “A bird’s eye view of vedas”. R K Math. Bangalore. [Http://rkmathbangalore.org/Books/ABirdsEyeViewOfTheVedas.pdf](http://rkmathbangalore.org/Books/ABirdsEyeViewOfTheVedas.pdf). *Last accessed on May 10, 2018.*
- Kashyap, R.L. (2003). “Introduction to Rig Veda” in Secrets of Rig Veda: First 121 Suktas, *Sri Aurobindo Kapāli Sāstry Institute of Vedic Culture*, pp 1 – 44.
- Archak, K.B. (2012). “The Brahmana Literature”, Chapter VIII in Essentials of Vedic Literature, Kaveri Books, New Delhi, pp 271 – 301.
- Archak, K.B. (2012). “The Āraṇyakas and Upaniṣads”, Chapter IX in Essentials of Vedic Literature, Kaveri Books, New Delhi, pp 302 – 329.
- Shashi Prabha Kumar. (2002). “Bhumisukta of the Atharvaveda”, in Vedic Traditions and Modern Crisis, (Ed.), Pushpendara Kumar, Eastern Book Linkers, Delhi, pp 10 – 22.
- Vasant Lad (1996), “Ayurveda: A Brief Introduction and Guide”, (whole article).
- Ramachandrudu P. (2010), “Glimpse into Kautilya’s Arthashastra”, (pp: 1-37), Sanskrit Academy, Hyderabad.

- “Sthapatya Veda – An introductory note”.
http://www.worldlibrary.org/articles/stahpatya_veda. Last accessed on Dec. 8, 2016.
- Bhagwat, B. (2009). “Kalpa-Vedān ga: Origin & Development”, *Adarsha Sanskrit Shoda Samsthan, Pune*, Selected portions from the book.
- Vartak, P.V. (1995). “Veda and Jyotish”, Part II, Chapter 2, in *Issues in Veda and Astrology*, H Pandya (Ed.), pp 65 – 73.
- Sundaram, A.V. (1995). “Astrology: Its usefulness and Limitations in Modern Times”, Part II, Chapter 9, in *Issues in Veda and Astrology*, H Pandya (Ed.), pp 129 – 135.
- Archak, K.B. (2012). “The Veda n ga Literature”, Chapter VIII in *Essentials of Vedic Literature*, Kaveri Books, New Delhi, pp 330 – 391.
- Gaur, N.A. (2009). “Ideal Village Planning” Chapter 2 in *Sthāpatya Ved-Vāstu Śāstra*, New Age Books, pp 26 – 39.
- Amita, S. (1998). “Design of Settlements in the Vaastu Shastras”, *Journal of Cultural Geography*, 17 (2), pp 27 – 41.
- Kantawala, S.G. (1999). “Pura n as: Source of Ancient Indian History & Culture”, Chapter 11 in *Studies in Pura n as*, Rashtriya Sanskrit Sansthan, pp 58 – 169.
- Pandey R. (2013). “Hindu Sam ska ras”, *Socio-Religious Study of the Hindu Sacraments*, Motilal Banarasidass, pp 1-35.
- Puligandla, R. (2005). “Fundamentals of Indian Philosophy”, DK Print World, New Delhi, 119 – 208.
- Hiriyanna, M. (2005). “Pu rvamī mam sa ”, Chapter 12, in *Outlines of Indian Philosophy*, Motilal Banarsidass, New Delhi, pp 298 – 335.
- Padurangi K. T. (2013). Apaurus eyatva and Svatastva of pra ma n ya, Chapter 7 and “The sentence” Chapter 47, in *Critical Essays of Pu rva Mī ma m sa*, Vidhyadhisha Post Graduate Sanskrit Research Centre, Bengaluru – 4, pp 44 – 46 and pp 355 – 384.

HUMAN RIGHTS

Credits: 3 Lecture: 45 Hour

Full mark: 100

Subject Teacher: Political Science

Course Objectives:

The course on Human Rights aims to provide a comprehensive understanding of the concept, evolution, and theoretical foundations of human rights, emphasizing their significance in contemporary society. It explores the historical development of human rights and examines various theories, including Natural, Legal, Utilitarian, and Marxist perspectives, to enable students to make broad examination of issues and policies taking into account diverse perspectives. The course delves into the universality of human rights amidst cultural diversity and assesses key international human rights instruments such as the Universal Declaration of Human Rights and subsequent international covenants and protocols. The course seeks to enable students to critically analyse the role of major international institutions like the UN, UNHRC, and UNOHCHR and their functions in promoting and protecting human rights. The course addresses contemporary issues and multidimensional threats to human rights to sensitize students on human rights issues in the local contexts. In the Indian context, it highlights the foundational principles of human rights, the institutional frame works along with the role of NGOs and civil society in human rights movements. Through this course, students will gain critical insights and analytical skills necessary to understand and address human rights challenges globally and within India.

Expected Learning Outcome:

After the completion of this course, the students would be competent in following skills and acquire adequate knowledge on the issues of Human Rights.

Unit I: They would understand the significance of human rights and its evolution over the period of time. Also, they would learn different human right theories and connotation of human rights across cultures.

Unit II: This unit would make them familiarise with international covenants on Human rights; the changing dynamics of state and role of global organisations working for the cause of Human Rights.

Unit III: After learning this unit, they would be aware about the multidimensional nature of human rights violation.

Unit IV: This unit would enlighten the students on Indian perspective of Human rights drawing upon ancient philosophy, Human rights issues in contemporary India, the institutional framework to address the human rights issues.

Unit I: Understanding Human Rights

- a) Connotation of 'Rights'; Meaning, Nature and Significance of Human Rights. Evolution and Historical Development of Human Rights.
- b) Theories of Human Rights: Natural, Legal, Utilitarian and Marxist;
- c) Universality of Human Rights and cultural diversity.

Unit II: International Human Rights

- a) International Covenants on Human Rights: Universal Declaration of Human Rights; International Covenants: Civil and Political Rights-1966, Economic, Social and Cultural Rights 1966; Optional Protocols-1976 and 1989, World Conference on Human Rights: Tehran 1968 and Vienna 1993.
- b) Institutional Framework: UN, UN Human Rights Council (UNHRC), UN office of the High Commissioner for Human Rights (UNOHCHR).
- c) State sovereignty and Human Rights; Human rights activism and role of Global Human Rights Organisations.

Unit III: Contemporary issues and Multidimensional aspect of threats to Human Rights.

- a) Atrocities against Women, Children, SCs, STs, Minorities, Differently abled people.
- b) Impact of Globalisation on Human Rights; Environment and Human rights issue.

- c) Refugee crisis and Migrations, Displacement, Bonded Labour, Custodial abuse, War crimes.

Unit III: Human Rights in India

- a) Underlying Human Rights Principles of Indian society: Dharma, Nyaya, Neeti, Ahimsa.
- b) Institutional Framework: Constitutional provisions, NHRC, SHRC; Judicial Activism.
- c) Human Rights Movements in India: Engagement of NGOs and Civil society in Protecting Human Rights.

Essential Readings:

1. Alan, B. (2017). Human rights and the environment: where next? In *Challenges in International Human Rights Law* (pp. 765-794). Routledge.
2. Barkin, J. S. (1998). The evolution of the constitution of sovereignty and the emergence of human rights norms. *Millennium*, 27(2), 229-252.
3. Beitz, C. R. (2009). *The idea of human rights*. OUP Oxford.
4. Cerna, C. M. (1994). Universality of human rights and cultural diversity: Implementation of human rights in different socio-cultural contexts. *Hum. Rts. Q.*, 16, 740.
5. Das, A. K., & Mohanty, P. K. (2007). *Human rights in India*. Sarup & Sons.
6. Donnelly, J., & Whelan, D. J. (2020). *International human rights*. Routledge.
7. Freeman, M. (2022). *Human rights*. John Wiley & Sons.
8. Gready, P. (2004). Conceptualising globalisation and human rights: boomerangs and borders. *The International Journal of Human Rights*, 8(3), 345-354.
9. Gudavarthy, A. (2008). Human rights movements in India: State, civil society and beyond. *Contributions to Indian Sociology*, 42(1), 29-57.
10. Henkin, L. (1989). The universality of the concept of human rights. *The Annals of the American Academy of Political and Social Science*, 506(1), 10-16.
11. Henkin, L. (1995). Human rights and state sovereignty. *Ga. J. Int'l & Comp. L.*, 25, 31.
12. Ishay, M. (2008). *The history of human rights: From ancient times to the globalization era*. Univ of California Press.

13. Kennedy, D. (2002). International human rights movement: Part of the problem?. *Harv. Hum. Rts. J.*, 15, 101.
14. Kurki, M. (2011). Human Rights and Democracy Promotion: reflections on the contestation in, and the politico-economic dynamics of, rights promotion. *Third World Quarterly*, 32(9), 1573-1587.
15. Langlois, A. J. (2002). Human rights: the globalisation and fragmentation of moral discourse. *Review of International Studies*, 28(3), 479-496.
16. Merry, S. E. (2009). *Human rights and gender violence: Translating international law into local justice*. University of Chicago Press.
17. Ray, A. K. (2003). Human rights movement in India: A historical perspective. *Economic and Political Weekly*, 3409-3415.
18. Shelton, D. (2006). Human rights and the environment: what specific environmental rights have been recognized. *Denv. J. Int'l L. & Pol'y*, 35, 129.
19. Sripati, V. (2000). India's National Human Rights Commission: A Shackled Commission. *BU Int'l LJ*, 18, 1.

Additional Readings:

1. Cole, W. M. (2005). Sovereignty relinquished? Explaining commitment to the international human rights covenants, 1966-1999. *American sociological review*, 70(3), 472-495.
2. Nyamu, C. I. (2000). How should human rights and development respond to cultural legitimization of gender hierarchy in developing countries. *Harv. Int'l. LJ*, 41, 381.
3. Oestreich, J. E. (2017). *Development and Human Rights: rhetoric and reality in India*. Oxford University Press.
4. Schmitz, H. P. (2014). Non-state actors in human rights promotion. *The SAGE Handbook of Human Rights*, 1, 352-71.

Internet Sources

1. Human Rights Course study materials in MA Political science.
<https://www.distanceeducationju.in/pdf/404%20HUMAN%20RIGHTS.pdf>
2. International Human Rights document, charters etc available at <https://csometer.info/international-human-rights-documents>
3. Defining Human Rights: Harper Lecture, The University of Chicago.
<https://youtu.be/2nYdTV9wuGI?si=EbZBuZvHR5gg4Ql5>
4. Reflections on the Origins of Human Rights (Talal Asad Lecture), Berkeley Centre
<https://youtu.be/Vd7P6bUKAWs?si=KIeG2rwRqvgxjCh6>

Activities to Do

1. Students should be encouraged and facilitated to visit NHRC or SHRC office to learn the functioning of the commission.
2. Conduct lecture on contemporary issues on Human rights in India.
3. Arrange a movie session for the students on issues of Human Rights. Movies like 13th (2016), The Whistleblower (2010), Mandela: Long Walk to Freedom (2013), Jai Bhim (2021).
4. Conduct community outreach programmes to spread awareness on Human Rights Day.

ENVIRONMENTAL ISSUES AND CHALLENGES

Credits: 3

Lecture: 45 Hour

Full mark: 100

Subject Teacher: Sociology

Course Outcomes:

On successful completion of this course students will be:

1. Able to value nature and its multiple components, and appreciate nature as a dynamic system with interdependent components
2. Able to understand the impacts of ongoing economic model, lifestyle and personal choices on the environment
3. Able to contribute as informed citizens to public discourses on common environmental issues.

Unit I: Introduction to environmental studies

- Meanings of environment, multiple ways of seeing it, multiple ways of diagnosing the 'environmental problem' and hence different solution
- Evolution of the concept
- Scope of sustainable development and sustainable consumption.

Unit II: Ecosystems

- Concept and types of ecosystems, their functions (ecosystem services) and interdependence especially in Indian context.
- National and international policies, treaties and politics of ecosystems management including Payment for Ecosystem services, Millennium Ecosystem Services, Convention of Biological Diversity, CITES, Ramsar Convention etc.
- Social and economic importance of various ecosystems for specific socio-economic groups; top-down and bottom-up conservation policies; and how these impact on equity across class, caste and other social hierarchies with reference to different ecosystems like forests, grasslands and wetlands.

Unit III: Biodiversity Conservation

- Concept of biodiversity, biodiversity resources of India (biodiversity hotspots), and endangered and endemic species.

- Threats to biodiversity from habitat loss, poaching, and unsustainable lifestyle/consumerism.
- Human-wildlife conflict, State-led conservation, community driven conservation, restoration ecology, international and national laws, policies and Institutions of Conservation.

Reading List:

1. Lélé, S. (2006, August). Thinking about ecological sustainability. In SEMINAR-NEW DELHI- (Vol. 564, p. 48). MALYIKA SINGH.
2. Marten, G. G. (2010). Human ecology: Basic concepts for sustainable development, Routledge.
3. McNeill, J. R. (2001). Something new under the sun: An environmental history of the twentieth-century world (the global century series). WW Norton & Company.
4. Agarwal, B. (2009). Environmental issues in India: a reader. Pearson Education India.
5. Agrawal, A., & Saberwal, V. (2007). South Asian pastoralism: The environmental question. Delhi: Pearson/Longman.
6. Gadgil, M., & Guha, R. (1993). This fissured land: an ecological history of India. Univ of california Press.
7. Mitsch, W. J., Bernal, B., & Hernandez, M. E. (2015). Ecosystem services of wetlands. International Journal of Biodiversity Science, Ecosystem Services & Management, 11(1), 1-4.
8. Odum, E. P. (1971). Fundamentals of ecology. Printing Company Ltd.
9. Cheryl Colopy, Dirty, Sacred Rivers: Confronting South Asia's Water Crisis, Delhi, 2012.
10. Praveen Singh (2006), 'Bridging the Ganga Action Plan: Monitoring failure at Kanpur', Economic and Political Weekly, February 18, pp. 590-592.

- 1 1. Pepper, I. L, Gerb, C. P. & Brusseau, ML. (2011), Environmental and Pollution Science. Academic Press.
12. Patwardhan A (2007) Global warming in India in Rangarajan, M (edited) (2007) Introduction in Environmental Issues in India: A Reade. Pearson. pp 550-558
13. Dubash, Navroz K. (2009) Climate Politics in India. Policy Brief. Centre for Policy Research. New Delhi
14. Baviskar, Amita (2006), 'Red in Tooth and Claw? Looking for Class in Struggles over Nature' in Raka Ray & Mary F. Katzenstein (eds.), Social Movements in India: Poverty, Power and Politics, OUP, 2006.
15. Gadgil, M., & Guha, R. (2008). 'Ecological Conflict and the Environmental Movement in India' in Mahesh Rangarajan (ed.). Environmental Issues in India: A reader, New Delhi: Dorling Kindersley Pvt. Ltd. (pp.385-428).

ENTREPRENEURSHIP DEVELOPMENT AND START-UP

Credits: 3 Lecture: 45 Hour

Full mark: 100

Subject Teacher: Commerce

Course Objectives

The paper aims to provide exposure to the students to the entrepreneurial culture and industrial growth and to prepare them to set up and manage their own small units.

Course Outcomes

After completion of the course, learners will be able to:

C01: Identify and assess the different types of entrepreneurs and barriers to entrepreneurship;

C02: Develop the decision-making skills to be an entrepreneur by creating new ideas;

C03: Understand the financial assistance provided by the government and other organizations;

C04: Demonstrate capacity to improve student achievement, engagement and retention;

C05: Enhances the critical thinking skills and gives a chance to think from a different perspective about industries.

Unit 1: Introduction

Evolution of term 'Entrepreneurship'; Factors influencing; Characteristics of an entrepreneur; Types of entrepreneurs; Edupreneurship; Barriers to entrepreneurship; Creativity and entrepreneurship- Creativity and entrepreneurship; Steps in Creativity; Innovation and inventions; Skills of an entrepreneur; Decision making and Problem Solving (steps indecision making);

Unit 2: Organisation Assistance and legal aspects

Assistance to an entrepreneur; New Ventures; Financial assistance to MSME; Copyright, Patent, Trademark, Franchise. Acts governing Entrepreneurship.

Unit 3: Mobilizing Resources

Resource Mobilization for entrepreneurship: Resources mobilization, types of resources, Process of resource mobilization, Arrangement of funds; writing a Funding Proposal, Traditional sources of financing, Venture capital, Angel investors, Business Incubators.

Unit 4: Managerial Aspects of Business and Government Initiatives

Managing finance; Understanding capital structure; organisation structure and management of human resources of a new enterprise; Marketing-mix; Management of cash; Relationship management; Cost management, Government initiatives for promoting entrepreneurship.

Suggested Readings

- ✓ Aron, R. A., & Tang, J. (2021). *The Role of Entrepreneurs in Society: An Action Perspective*. Edward Elgar Publishing.
- ✓ Hisrich, R. D., Peters, M. P., & Shepherd, D. A. (2021). *Entrepreneurship*. McGraw-Hill Education.
- ✓ Kuratko, D. F., & Neck, H. M. (2017). *Entrepreneurship: Theory, Process, and Practice*. Cengage Learning.
- ✓ Shane, S. A. (2017). *A General Theory of Entrepreneurship: The Individual-Opportunity Nexus*. Edward Elgar Publishing.
- ✓ Shepherd, D. A., & Patzelt, H. (2020). *The New Field of Sustainable Entrepreneurship: Studying Entrepreneurial Action Linking "What Is to Be Sustained "with" What Is to Be Developed"*. Springer.
- ✓ Desai, V. (2009). *Dynamics of Entrepreneurial Development and Management*. Mumbai: Himalaya Publishing House.
- ✓ Dollinger, M. J. (2008). *Entrepreneurship: Strategies and Resources*. New Jersey: Prentice Hall.
- ✓ Hisrich, R., Peters, M., & Shepherd, D. (2017). *Entrepreneurship*. New York: McGraw Hill Education.
- ✓ Rao, T. V., & Kuratko, D. F. (2012). *Entrepreneurship: A South Asian Perspective*. Boston: Cengage Learning

HEALTH PSYCHOLOGY

Credits: 3 Lecture: 45 Hour

Full mark: 100

Subject Teacher: Psychology

Introduction:

Health psychology is a specialty area that focuses on how biology, psychology, behavior and social factors influence health and illness. This course is designed to help students in understanding basics of Health Psychology that addresses the role of behavioral factors in health and illness. Basic theories, models and applications are also included.

Course Outcomes:

- To help the students understand the issues of Health Psychology and how to address them by the bio-psychosocial model of health and illness.
- To help the students to describe behavioral factors that influence health and illness.
- To guide the students to understand about health enhancing behaviors including coping with illness.

Unit I: Introduction

- Meaning & Goals of Health Psychology, Biopsychosocial model of health and illness
- Basic nature of stress, GAS model of stress, Cognitive appraisal of stressors, causes of stress, Management of stress

Learning Outcomes

- Know the basics of health and illness from the Bio-psychosocial perspectives.
- Get an insight on nature, model of stress, it's causes and how to manage it.

Unit II: Models of Health Behaviour

- The Theory of Planned Behaviour; The Health Belief model
- The Protection Motivation model; Leventhal's Self-regulatory model Learning Outcomes
- Understand the significance of behavioral and psychological correlates of health and illness.

UNIT- III: Health Compromising and Health Promoting Behaviour

- (i) Health compromising behaviour: - causes and treatment of Alcoholism, Smoking, Hypertension, Coronary Heart Disease, Diabetes; Coping with AIDS and Cancer
- (ii) Health Promoting behaviour: - Health Promotion and Health Habits, Yoga, meditation, diet, exercise, prevention strategies (primary, secondary, tertiary)

Learning Outcomes

- Understand the significance of behavioral and psychological correlates of health and illness.
- Understand the importance of health enhancing behavior.

Text Books:

- ✓ *Taylor, S.E. (2006). Health Psychology (6th Ed.). New York: Tata McGraw Hill*
- ✓ *Brannon and Feist. Health Psychology.*
- ✓ Swain, S. Applied Psychology, New Vishal Publications, New Delhi

Reference Books:

- ✓ Ogden, J. (2007). Essentials of Health Psychology. McGraw Hill.
- ✓ Kar, C. (2013), Health Psychology (Second Revised Edition), Kalyani Publisher

PHILOSOPHY OF BHAGAVAD GITA

Credits: 3 Lecture: 45 Hour

Full mark: 100

Subject Teacher: Sanskrit

Introduction:

This course on the philosophy of the Bhagavad Gita will offer a comprehensive exploration of the profound philosophical and spiritual teachings found within this ancient Indian text, and provide its applications in Modern life situations, particularly when guidance is required for very many problems in life.

Course Outcomes:

- Understanding of the ideal of dharma and its role in a civilized society,
- Understanding of the role and importance of knowledge, action, and devotion in life.
- Knowledge of leading life with a sense of detachment.

Learning Outcome

Unit-I Yoga is to purify our actions, Yoga is to control the mind and senses and Yoga is to link oneself to Supreme with devotion. Yoga is the path of selfless actions without expecting the consequences or results. the spiritual seeker acts according to Dharma (righteousness).

Unit-II An important philosophical concept in Karma yoga, it means to act unselfishly, or without personal gain in mind. When acting out of Nishkama Karma, an individual is acting or acting without any expectation that good will be returned to him/her or without attachment to its fruits.

Unit-III Jnana yoga encourages its adepts to think and speak of themselves in the third person as a way to distance themselves from the Ego and detach their eternal self (atman) from the body-related one (*māyā*).

Unit-IV the Bhagavad Gita places great emphasis on devotion to God. Through devotion, an individual can attain the ultimate truth and realize their unity with the divine. This path of devotion is accessible to all, irrespective of their social standing or spiritual knowledge.

Unit-I:

Dharma:-Varnadharma, Svabhava, Sadharma- Paradharma

Unit-II:

Karma:-Classification of Karma; Sense of Agency, Nişkāma Karma, Lokasaṁgraha, Relation between Karma Yoga and Jñāna yoga.

Unit-III:

Jnana:- Distinction between Jnana and Vijñāna. Criteria of True Knowledge (Buddhi Yoga & JñānaYoga), Kṣetra,

Kṣetrajña, Puruṣottama.Sāttvika, Rājasika and Tāmasika Jñāna

Unit-IV:

Bhakti Yoga:- Four kinds of devotees, Characteristics of Ideal Bhakti- Saraṇāgati & Prapattikrupa (grace);

Relation between Bhakti Yoga & Jñāna Yoga

Prescribed Books

- *S. Radha krishnan, the Bhagavad Gītā (Trs.&Ed.)*
- *S. C. Panigrahi, the Concept of Yoga in the Gita, Prajnaloka, Puri*

Reference Books

- *K. M. Munshi & R. R. Diwakar, Bhagavad Gītā & Modern Life*
- *Basanta Kumar Dash, Philosophy of Isopanisad and the Gita, Gyanajuga Publication, Bhubaneswar*
- *G. K. Warriar, Śrīmad Bhagavad Gītā Bhāṣya of Sri Sankarāchārya: (Trs), Advaita Ashram, Ramakrishna Math.*
- *P. N. Srinivasachari, the Ethical Philosophy of Gītā.,*
- *Pandita Nilakantha Das, Srīmad Bhagavad Gītā, New Students Store Binod Vihari, Cuttack.*
- *Viharilal Pandits ed., Śrīmad Bhagavad Gītā, (Odia) DharmaGrantha Store, Cuttack..*

E- Recourses

1. <https://youtu.be/bedsn7xln0w?si=VW5iQdLgDu5UDhA6>
2. https://anubooks.com/uploads/session_pdf/16623612876.pdf

3. <https://ijcrt.org/papers/IJCRT2101218.pdf>
4. <https://youtu.be/HHIv6qJlRjI?si=MML5aslZRwUvE1Rl>
5. https://en.wikipedia.org/wiki/Inana-Vijnana_Yoga
6. https://en.wikipedia.org/wiki/Bhakti_yoga

Sample Questions: 1 for Part- I Objective; Part- II Very Short Type (in 50 Words); Par-III Short Type (in 250 Words); Par-IV Long Type (in 800 Words);

Unit – I

1. Dharma Literally Means_____?
2. What Is Sreya?
3. What Is Varna Dharma?
4. What Is the Meaning of Dharma in the Bhagavad Gita? Discuss.

Unit – II

1. _____is the Vikarma?
2. Distinguish Between Karma, Vikarma, and Akarma.
3. Who Is Fit to Follow the Path of Jnana?
4. Discuss the Concept of Bondage and Liberation In the Bhagavad Gita

Unit – III

1. _____Is Called Ksetra?
2. State the Characteristics of Tamasika Jnana.
3. State the Characteristics of Sattvika Jnana.
4. Explain the Jnana of the Bhagavad Gita and illustrate its Significance.

Unit – IV

1. _____Is the Highest State of Bhakti?
2. How Jnana and Bhakti Are Related?
3. How Can One Attain the Highest State Niskama Bhakti?
4. What Are the Characteristics of A True Devotee? Discuss.

HERBARIUM PREPARATION

Credits: 3 Lecture: 45 Hour

Full mark: 100

Subject Teacher: Botany

Objectives:

- To introduce the basics of herbaria and herbarium specimens.
- To educate on the methods for preparation and handling of specimens and materials.
- To know the methods of collection, processing and storage of herbarium specimens.
- To learn about the range of application of herbaria in plant taxonomy.

Course Outcomes:

- The students shall have a basic knowledge on the herbaria and herbarium specimens.
- The students shall get the opportunities to learn the basics specimen processing and proper storage for use.
- The students shall be able to understand the range of application of the herbaria and herbarium specimens.
- The students would be able to learn the application of modern tools for information collection, storage and sharing.

Unit-I: LO: The learners shall gain knowledge on the importance of herbarium in plant taxonomy.

- Herbaria: Introduction, history and objectives; Types of herbaria; role of herbaria in teaching, and research; important herbaria of India and the world.
- Herbarium specimen - types and diversity- loose seeds, dried and bulky fruits, algae, fungi, wood sections, pollen, microscope slides, silica-stored materials, DNA extractions, and fluid-preserved flowers or fruits; use of specimens. Plant collections and maintenance of live specimen.

Unit-II: LO: The learners shall gain knowledge and skills on the preparation and processing of herbarium specimens.

Herbarium methodology: Collection, field notes; Processing of specimen-poisoning, pressing, drying, mounting, stitching, identification and arrangement. Methods to address specimen diversity - Algae, fungi, and bryophytes; methods of their collection, processing and preservation.

Unit-III: LO: The students shall be able to understand the long-term storage, and use of specimen as well as on the procedure for data and knowledge sharing in the field.

Maintenance and curing of specimen, materials and illustrations-moisture management, heating, chemical treatments, fumigation. Handling of Specimen; library and special collections; exchange of specimens. Use of computer, databases and webs - Local and global databases; Herbaria for outreach activities - services, education, plant identification and conservation.

Activities to do:

1. Field survey and collection of plant materials
2. Methods of pressing and drying
3. Drying of materials by using chemicals- alcohol, glycerol, formaldehyde, FAA
4. Preservation of materials-moist and dried
5. Mounting, labelling and cataloguing of herbarium specimen
6. Use of computers for herbarium cataloguing and management
7. Seed collection and storage

Text book:

- *E. Amodu (2017). Field Herbarium Techniques, Lambert Academic Publishers.*

Reference Book:

- Specimen preparation guide-University of Florida Herbarium –(FLAS)-2023
- Sanwal et al. (2020). Introduction to procedures for preparation of herbarium specimen, NBPGR, - New Delhi
- Victor J, et al (2004). Herbarium essentials – The southern African herbarium user manual. SABD Network Report.