

Department of Yoga
School of Sports Science, Yoga and Education

Ph.D. in Yoga
(PhD Course work Syllabus)



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With Effect from the Academic Year 2025 - 2026

Central University of Rajasthan
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BACKGROUND

The advancement of research and innovation is central to the mission of the Central University of Rajasthan. In alignment with the National Education Policy (NEP) 2020 and the University Grants Commission (UGC) Regulations on Ph.D. programs, the University has revised its Ph.D. coursework structure to foster critical thinking, research skills, ethical scholarship, and interdisciplinary inquiry.

Aligned with the National Credit Framework (NCrF), the Ph.D. coursework is positioned at Level 8, ensuring appropriate academic rigor and research readiness. The revised framework also emphasizes exposure to pedagogical practices, curriculum design, credible evaluation systems, effective communication, and leadership training, recognizing that many research scholars will become future faculty members, researchers, and public intellectuals. To prepare them for such roles, Ph.D. students are required to gain a minimum number of hours of teaching experience through teaching assistantships and related activities. Furthermore, scholars are encouraged to engage in collaborative research, participate in national and international conferences, and contribute to scholarly publications, enhancing their academic and professional profile.

Additionally, in compliance with NEP 2020 and the UGC directive, a compulsory two-credit course on Research and Publication Ethics (RPE) has been incorporated into the Ph.D. coursework to promote academic integrity and responsible research practices. A structured framework of compulsory courses across all disciplines has been established to ensure uniformity and uphold the highest standards of research education. The inclusion of modern research methodologies, digital literacy, and academic writing modules equips students with the necessary skills to navigate the evolving research landscape effectively.

The University remains committed to continually reviewing and updating the Ph.D. coursework to align with emerging global academic trends, national priorities, and the dynamic needs of society. By fostering a culture of excellence and intellectual curiosity, the University aims to produce well-rounded scholars capable of addressing complex challenges and contributing meaningfully to their respective fields.

INTRODUCTION ABOUT THE YOGA DEPARTMENT

The Department of Yoga at the Central University of Rajasthan was established in 2017 under the School of Education. It aims to explore and propagate the therapeutic benefits of yoga through academic training, research activities, and clinical services. The department is dedicated to promoting health and wellness by integrating traditional yogic practices with modern scientific approaches.

The department offers a Master's degree in Yoga Therapy and a Ph.D. in Yogic Science. These programs are designed to provide students with a comprehensive understanding of the physical, physiological, and psychological benefits of yoga. The curriculum is aligned with the National Education Policy (NEP) 2020, ensuring that students receive a holistic education that combines theoretical knowledge with practical application.

The department is equipped with state-of-the-art facilities, including a newly constructed building with a dedicated yoga hall, computer lab, and research laboratories. These facilities support various research projects aimed at understanding the efficacy of yoga in enhancing mental health, physical fitness, and overall well-being. The department also provides yoga therapy services to university staff and students, fostering a healthy campus environment. Additionally, it conducts yoga workshops in nearby villages and schools.

Led by experienced faculty members, the department emphasizes the importance of research and innovation in the field of yoga. Faculty members are actively involved in research projects that explore the therapeutic potential of yoga in managing chronic health conditions such as heart disease, diabetes, hypertension, and mental health disorders. Currently, the department has four faculty members, twelve Ph.D. scholars (ten of whom are JRF), thirty-five Master's students, and eighty-three alumni. Many alumni are working as yoga therapists in government positions, private healthcare companies, abroad, and have opened their own yoga centers. The department has published more than thirty research papers in reputed journals indexed in Web of Science and Scopus.

Among the best practices, the department has introduced morning prayers, and all classes are conducted in a traditional manner, with both teachers and students sitting on the floor. The department is a shoe-free zone and holds devotional sessions every week.

NAME OF THE PROGRAMME

Doctorate of Philosophy (PhD) in Yoga

VISION STATEMENT

To foster scholarly excellence in Yoga research and education, blending ancient wisdom with modern innovation for the holistic well-being of society

MISSION STATEMENT

To cultivate ethically grounded, research-driven Yoga scholars with critical thinking, interdisciplinary perspectives, and leadership skills, committed to advancing knowledge, promoting wellness, and serving global and local communities through the science of Yoga

OBJECTIVES OF THE PROGRAMME

- **Advance Knowledge and Research:** Foster deep understanding of Yoga traditions and promote original, innovative, and interdisciplinary research.
- **Develop Critical, Ethical, and Analytical Skills:** Cultivate critical thinking, research ethics, scientific inquiry, and analytical abilities for high-quality scholarship.
- **Strengthen Teaching and Communication Competence:** Prepare scholars for academic careers by providing exposure to pedagogical practices, curriculum design, evaluation systems, and public communication.
- **Promote Societal Well-being through Yoga:** Encourage research that addresses health, education, sustainable living, and social challenges using Yoga-based approaches.
- **Inspire Leadership, Innovation, and Lifelong Learning:** Equip scholars to become thought leaders, innovators, and lifelong learners who contribute to the global advancement of Yoga science.

DURATION OF THE PROGRAMME

The duration of the Ph.D. programme is five years. A scholar may be allowed to submit dissertation/thesis after three years if the DRC is satisfied that the scholar has demonstrated exceptional results in the thesis. Early submission due to personal reasons will not be considered. Academic Council may grant extension of one year (beyond the maximum time limit of 5 years) on

recommendation of the DRC and the concerned School Board, provided that (i) there is sufficient justification for non-submission of thesis within five years and (ii) there are reasonable chances for submitting thesis if extension is granted. The recommendation of DRC must explicitly justify these two reasons while recommending for extension. Under no circumstances extension beyond six year of total duration, will be possible. The name of a scholar will be removed from the rolls of the university if he/she fails to submit his/her thesis within five years of the date of his/her during normal registration period and six years in the case of extended period. The women candidates and Persons with disability may be allowed relaxation as per the UGC Regulations issued from time to time.

ADMISSION PROCEDURE

The admission to this programme shall be through a common interview conducted by the respective departments of the host University. The candidates with UGC NET/UGC JRF, AYUSH NET/JRF, GATE can apply for appearing for the interview.

ELIGIBILITY OF THE CANDIDATES

MSc in Yoga/Yogic science/Yoga therapy, MD in Yoga/Yoga therapy /Clinical Yoga with 55% aggregate and UGC/AYUSH NET/JRF become eligible for PhD in Yoga

NUMBER OF SEATS

Every year, number of seats in the department will be decided based on the vacancy available with each guide in the department.

GRADUATE ATTRIBUTES

Graduates of the Ph.D. in Yoga program at the Department of Yoga, Central University of Rajasthan will emerge as scholarly leaders equipped with profound expertise in Yoga philosophy, science, and therapeutic application. They will demonstrate the ability to conduct original, high-impact research that integrates traditional Yogic wisdom with contemporary scientific inquiry. Trained in pedagogy, curriculum design, and credible evaluation systems, they will be ready to assume roles as faculty, researchers, wellness consultants, and thought leaders. With strong ethical foundations, critical thinking abilities, interdisciplinary perspectives, and effective communication skills, they will contribute meaningfully to academia, healthcare, policy, and community development. Rooted in

India's rich cultural heritage yet responsive to global challenges, Ph.D. graduates will embody lifelong learning, innovation, leadership, and a deep commitment to promoting holistic well-being through Yoga.

QUALIFICATION DESCRIPTORS

Graduates of the Ph.D. in Yoga program will:

- **Demonstrate Comprehensive Knowledge:** Exhibit an advanced, critical understanding of Yoga philosophy, science, therapy, and its interdisciplinary applications.
- **Conduct Independent Research:** Design, execute, and disseminate original research contributing significantly to the advancement of Yoga studies and allied fields.
- **Apply Critical and Analytical Thinking:** Critically evaluate classical texts, scientific literature, and contemporary issues to generate innovative and scholarly insights.
- **Exhibit Professional and Ethical Competence:** Uphold the highest standards of research ethics, academic integrity, and professional responsibility in academic and applied settings.
- **Contribute to Teaching and Knowledge Dissemination:** Effectively communicate complex Yoga concepts and research findings to academic peers, students, and the broader community, with competence in pedagogy and curriculum development.

PROGRAM LEARNING OUTCOMES

Upon completion of the Ph.D. in Yoga, scholars will be able to:

1. **Demonstrate Mastery of Disciplinary Knowledge:** Exhibit deep understanding of Yoga philosophy, science, therapy, and their contemporary relevance.
2. **Conduct Independent, Original Research:** Design, implement, and present research contributing new knowledge to the field of Yoga and related areas.
3. **Apply Critical and Analytical Thinking:** Critically evaluate traditional texts, scientific studies, and evolving societal needs with an interdisciplinary perspective.
4. **Communicate Effectively and Teach Competently:** Articulate complex ideas clearly in academic, research, and public domains, and demonstrate pedagogical skills.
5. **Uphold Ethical and Professional Standards:** Maintain academic integrity, ethical research practices, and responsibility toward societal and global well-being.

PROGRAM SPECIFIC OUTCOMES

After completing the Ph.D. in Yoga program, scholars will be able to:

1. **Critically Interpret and Analyze Yogic Texts:** Engage deeply with classical Yoga scriptures and interpret them in light of contemporary scientific understanding.
2. **Develop Evidence-based Yoga Interventions:** Create Yoga therapy modules and research models that integrate traditional knowledge with modern clinical or educational practices.
3. **Contribute to Interdisciplinary Research:** Innovate by connecting Yoga with fields like psychology, neuroscience, education, public health, and management.
4. **Demonstrate Professional Teaching and Mentorship:** Plan and deliver curriculum, mentor students, and lead Yoga education initiatives effectively.
5. **Advance Yoga for Societal Well-being:** Apply Yoga-based knowledge to address public health, mental wellness, lifestyle diseases, and sustainable living challenges locally and globally.

COURSE MAPPING OF THE PROGRAM SPECIFIC OUTCOME AND CORE COURSES

PSO	CC 1	CC2	CC3	CC4	CC5
PSO-1	√	√		√	√
PSO-2	√	√			√
PSO-3	√	√		√	
PSO-4	√	√	√	√	
PSO-5			√	√	√

EVALUATION

A scholar must secure at least 55 percent marks or equivalent grade in each of these papers in order to clear the coursework successfully. PhD courses do not have any internal tests. The final examination will be for 100 marks.

Course Structure

Sl. No.	Course code	Title of the Courses	Type of Course	Credits
1.	YOG 801	Research Methodology	Core	4
2.	YOG 802	Research and Publication Ethics (RPE)*	Core	2
3	EDU XXX	Pedagogy in Higher Education#	Core	3
4	YOG 803	Practice-based Teaching Skills (Non-graded)	Core	3
5	YOG 804	Literature Review and Journal club	Core	4
6	YOG 8XX	Electives	DSE (Select any one)	4
Total Credits				20

* The detailed curriculum is given by the UGC vide circular in August 2019 and also accepted by the University. It is compulsory course to be offered by the department or students can opt this course from SWAYAW/NPTEL.

Pedagogy of higher education' will be offered as a Compulsory course by the department of education

Course Syllabus

Core Courses

Course Name: Research Methodology

Course Code: YOG 801 No. of Credits: 4

Total Evaluation Marks: 100

Course Objectives

- Making Research Methodology course palatable to a student to make him independent
- Learning Research Ethics to ensure that every guideline drawn in research is fair and acceptable

Course Outcomes

- Scholars will be able to conceptualize a research idea, refine it by reviewing the sufficient literature and make a plan of action to carry out their search trial
- Scholars will be independent in obtaining the data, analysis and its interpretation

Course Structure

Unit 1 (20 hrs)

Foundations of Research: Meaning, Objectives, Motivation, Utility. Concept of theory, empiricism, deductive and inductive theory; Characteristics of scientific method – Understanding the language of research – Concept, Construct, Definition, Variable; Research Process; Problem Identification & Formulation–Research Question–Investigation Question – Measurement Issues – Hypothesis – Qualities of a good Hypothesis –Null Hypothesis & Alternative Hypothesis; Hypothesis Testing–Logic & Importance;

Research Design and Measurement Research Design: Concept and Importance in Research– Features of a good research design Exploratory Research Design – concept, types and uses, Descriptive Research Designs –concept, types and uses. Descriptive Research Designs –concept, types and uses. Experimental Design: Concept of Independent & Dependent variables; Qualitative and Quantitative Research: Qualitative research–Quantitative research Concept of measurement, causality, generalization, replication; merging the two approaches; Measurement: Concept of measurement–what is measured? Problems in measurement in research– Validity and Reliability; Levels of measurement–Nominal, Ordinal, Interval, Ratio

Unit 2 (20 hrs)

Sampling and Data Analysis: Sampling: Concepts of Statistical Population, Sample, Sampling Frame, Sampling Error, Sample Size, Non Response; Characteristics of a good sample. Probability

Sample – Simple Random Sample, Systematic Sample, Stratified Random Sample & Multi-stage sampling. Determining size of the sample – Practical considerations in sampling and sample size; Data Analysis: Data Preparation – Univariate analysis (frequency tables, bar charts, pie charts, percentages), Bivariate analysis – Cross tabulations and Chisquare test including testing hypothesis of association;

Interpretation of data and Scientific writing: Interpretation of Data and Paper Writing – Layout of a Research Paper, Journals in Computer Science, Impact factor of Journals, When and where to publish? Ethical issues related to publishing, Plagiarism and Self-Plagiarism; Use of Encyclopedias, Research Guides, Hand book etc., Academic Data bases for Computer Science Discipline.

Use of tools/techniques for Research: methods to search required information effectively, Reference Management Software like Zotero / Mendeley, Software for paper formatting like LaTeX/MSOffice, Software for detection of Plagiarism.

Unit 3 (10 hrs)

Biostatistics: Data Collection, presentation, data processing, classification and tabulation.

Measures of Central tendency and Dispersion, Probability distribution: Binomial, Poisson and Normal, Confidence Interval, Errors, Sampling: types, steps; sampling errors Quantitative Techniques: Levels of significance, Regression and Correlation, Interpolation and Extrapolation, Sampling of attributes (including chi square test), Sampling of small and large sample variables (including Anova), fundamentals of hypothesis testing. Statistical decision theory Parametric vs. non-parametric tests.

Unit 4 (10 hrs)

Research Communication: Synopsis writing, Reference writing - different styles viz., Harvard, Vancouver, APA using Mendely, Reporting effect size and sample size calculations, Reporting analysis for categorical data – relative risk and odds ratio, EQUATOR Network Guidelines - Reporting guidelines for case report, RCTS, Observational studies, The publication processes – from submission to acceptance – steps involved, Research paper writing, Thesis writing.

Suggested Readings:

- Statistical Methods for Research Workers by Fisher R.A., Cosmo Publications, New Delhi ISBN:81-307-0128-6
- Design and Analysis of Experiments by Montgomery D.C.(2001), John Wiley, ISBN:0471260088
- Manual for Research and Publication Ethics in Science and Engineering (2016). Eun Seong Hwang, Eun Hee Cho, Young-Mog Kim, Kibeom Park, Wha-Chul Son, Tae-Woong Yoon, Jeong Mook Lim; Published by Korean Federation of Science and Technology Societies, Seoul, Korea.
- Ethics of Publication (2019). Subhash Chandra Lakhota and Srinivasan Chandrasekaran; Indian National Science Academy, New Delhi 2019; ISBN: 978-81-939482-1-7

Course Name: Practice Based Teaching Skills**Course Code:** Yog 803 **No. of Credits:** 3

Department will facilitate this course. The Research Scholar will facilitate teaching / practical sessions for part of one or more courses as may be approved by the HOD on recommendation of the DRC. The RS will prepare detailed lesson plans, design learning events, develop contents and facilitate the lecture / practical sessions under supervision of the guide / course instructor.

This course can be taken after successful completion of the basic course 'Pedagogy for higher Education'. This course would be a non-graded course.

There is no fixed time/ duration for completion of this course. It may be done anytime during the period of stay of the scholar preferably from the second to six semesters of the PhD programme in the extended period of time.

Course Name: Journal Club and Literature Review**Course Code:** YOG 801 **No. of Credits:** 4**Total Evaluation Marks:** 100**Mode of Examination:** Presentation***Course Objectives***

- To make students understand the relevance of Literature review in refining the research ideas
- Explore the novel ideas and concepts

Course Outcomes

- Do the literature review independently
- Write the critics about a research paper
- Present a research paper in the journal club

Course Structure**Literature Review**

The scholar should perform detailed literature review related to his/her research topic and present.

Journal Club

Each scholar will search out 10 best research papers from the good impact factor and peer reviewed journals. All ten research papers will be given to the supervisor and he/she will select four out to ten and direct the scholar to write the critics about each research paper and submit the same to the supervisor and other scholars at least one week prior to his/her presentation.

The scholar will present the paper with minimum slides and minimum words.

Search Engines to be used:

🌐 Pub-med, Web of Science, and Google Scholar

List of electives to be offered by the respective supervisors

Sl No	Course Code	Course Title	No of Credits
1.	YOG 805	Yoga and Cardiovascular Disease	4
2.	YOG 806	Yoga and Mental Health	4
3.	YOG 807	Neuroscience and Autonomic Functions	4
4.	YOG 808	Pathogenesis, tools and techniques of pulmonary diseases	4
5.	YOG 809	Respiratory Physiology, tools and Technique	4
6.	YOG 810	Yoga and Female Reproductive Health	4
7.	YOG 811	Cognitive Enhancement and Digital Well-being	4
8.	YOG 812	Yoga for Sports Performance	4
9.	YOG 813	Yoga for Occupational Stress	4
10.	YOG 814	Tools and Techniques in Cognitive Science for Yoga Research	4
11.	YOG 815	Opium Substance Use on Health and tools and techniques for Diagnosis and Assessments	4

Course Name: Yoga and Cardiovascular Disease

Course Code: YOG 805 No. of Credits: 4

Total Evaluation Marks: 100

Course Objectives

- To understand cardio-vascular physiology.
- To learn about major cardiovascular diseases in detail.
- To learn yoga therapy for cardiovascular disease.
- To study evidence-based yoga for cardiovascular disease.

Course Outcomes

- Anatomy and physiology of cardiovascular system.
- Causes, clinical features and pathophysiology of cardiac disease.
- Evidence based yoga for cardiovascular disease.

Course Structure

Unit 1 (15 hrs)

Anatomy and Physiology of heart: Location of heart, atria, ventricles and walls of the heart. Anatomy of blood vessels, major blood vessels in the body, arteries and veins. Electric conduction of heart, physiology of blood pressure, cardiac autonomic function

Unit 2 (15 hrs)

Cardiovascular diseases: Major cardiac diseases and their causes, clinical features and pathophysiology. Coronary artery disease, Ischemic heart disease, hypertension, and congestive cardiac failure.

Unit 3 (15 hrs)

Yoga and its role in cardiovascular disease: Physiological effects of yoga on cardiovascular system, Yoga and blood pressure, heart rate, baroreflex sensitivity, heart rate variability.

Unit 4 (15 hrs)

Evidence based Yoga for cardiovascular disease: Research findings in on yoga in hypertension, coronary artery disease, congestive cardiac failure and Post CABG.
Yoga in cardiac rehabilitation.

Suggested Readings:

- Gerard J. Tortora, Bryan Derrickson (2014). Essentials of Anatomy and Physiology (1 st ed.), ISBN: 9788126544806, Wiley India Pvt Ltd.
- K Sembulingam (2019), Essentials of Medical Physiology (8th ed.), ISBN-10:9352706927, Jaypee Brothers Medical Publishers
- G K Pal and Parvati Pal (2016). Text book of Practical Physiology (1st Therapeutic Use of Yoga and Ayurveda for Health and Fitness (1st edition), ISBN-10: 1590301315, Shambhala Publisher edition), ISBN-10: 8173719969, The Orient Blackswan PublisherG. Mohan and Indira Mohan (2004). Yoga Therapy: A Guide to the
- R. Nagarathna and H. R. Nagendra (2008). Yoga for Hypertension (2nd edition), Swami Vivekananda Yoga Publications, Bangalore, India
- R. Nagarathna and H. R. Nagendra (2008). Yoga for heart disease (2nd edition), Swami Vivekananda Yoga Publications, Bangalore, India
- Indranil Basy Ray & Darshan Mehta. Text Book of Principles and Practice of Yoga in Cardiovascular Medicine. Springer Nature. 2022.

Course Name: Yoga and Mental Health

Course Code: YOG 806 No. of Credits: 4

Total Evaluation Marks: 100

Course Objectives

- To understand mental health and its importance.
- To learn about common mental health problems.
- To learn yoga therapy for various mental disorders.
- To study evidence-based yoga for mental disorders.

Course Outcomes

- Importance of mental health.
- Causes and clinical features of common mental disorders.
- Evidence-based yoga for mental disorders.

Course Structure

Unit 1 (15 hrs)

Psychology: Definition and relevance. Mind—conscious, sub-conscious, and unconscious. Mind and behavior. Importance and determinants of mental health. Mental health and quality of life. CBT, meditation, and planned behavior.

Unit 2 (15 hrs)

Major mental disorders: Anxiety, OCD, Phobia, depression, bipolar disorder, schizophrenia, and personality disorders. Conventional management techniques and their limitations.

Unit 3 (15 hrs)

Yoga and mental health: Yoga for mental relaxation, self-compassion, mindfulness, and self-esteem. Yoga and anxiety, OCD, depression, schizophrenia, and bipolar disorder.

Unit 4 (15 hrs)

Evidence-based Yoga for mental disorders: Research findings on yoga in anxiety, OCD, depression, addictions, schizophrenia, and bipolar disorder.

Suggested Readings:

- Charls Stangor. Introduction to Psychology. ISBN: 978-1-77420-004-9
- R. Nagarathna and H. R. Nagendra (2008). Yoga for Mental Disorders. Swami Vivekananda Yoga Publications, Bangalore, India
- Hemant Bhargav. Yoga for Depression. Swami Vivekananda Publications, 2016
- Shivarama Varambally, Sanju George, TM Srinivasan, Hemant Bhargav. The Science and Art Of Yoga In Mental And Neurological Healthcare. Jaypee Brothers Medical Publishers, 2021

Course Name: Neuroscience and Autonomic Functions

Course Code: YOG 807 No. of Credits: 4

Total Evaluation Marks: 100

Course Objectives

- To understand the principles of Neuroscience with in depth understanding.
- To understand the Neurophysiological functions in detail with underlying mechanism.

Course Outcomes

- Explain the structure and functions of the Brain in detail.
- Explain the Neurophysiological function such as Action potential, Resting potential etc.
- Describe the principles and procedure of Neurophysiological techniques.
- Describe the principles and procedure of Autonomic function tests.
- To have an understanding about the Neurophysiological techniques and Autonomic Nervous system.

Course Structure

Unit 1 (15 hrs)

Neuroanatomy: Gross anatomy of adult brain, organization of the nervous system, subdivision of the nervous system, concept of CNS, ANS & PNS, meninges. The scalp, skull, meninges and cerebrospinal fluid, anatomy of the pituitary (normal & enlarged), vertebral column, cutaneous nerve supply of head and neck limb and trunk. Brain, spinal cord, cranial nerve, spinal nerve, autonomic nervous system.

Unit 2 (10 hrs)

Neurophysiology: Neurons and glial cells, Resting Potential & Action potential, Propagation of Nerve Impulses, Degeneration & regeneration /repair of nerve fibers, Nerve growth factors. Synaptic & neuro-muscular transmission, Muscle tone, posture, Equilibrium & their regulation. Pain production, pathways and analgesics, headache & referred pain. Vestibular apparatus & motion sickness. Integrative functions of thalamus, cerebellum, basal ganglia & Cerebral cortex. Blood brain barrier, Blood CSF barrier, Split Brain, EEG.

Unit 3 (15 hrs)

Neurophysiological techniques: Principles, procedure and working mechanism of Electroencephalogram (EEG), Evoked potentials (EP), Event related potentials (ERP), Transcranial Doppler (TCD), Functional near infrared spectroscopy (fNIRS), Magnetoencephalogram (MEG), Magnetic resonance imaging (MRI), Functional magnetic resonance imaging (fMRI). Computerized tomography (CT), Positron emission tomography (PET), and Single positron emission tomography (SPET).

Unit 4 (15 hrs)

Autonomic Function tests: Principles, procedure and working mechanism of Electrocardiogram (ECG), Galvanic skin resistance (GSR), Finger plethysmogram (PPG), Non-invasive blood pressure (NIBP), respiratory rate (RR), Oxygen saturation (SpO₂).

Suggested Readings:

- Eric Kandel (2011) Principles of Neuroscience, 5th Edition, McGraw Hill Publisher, New York, USA
- Frank Amthor (2016) Neuroscience For Dummies, 2nd Edition, John Wiley & Sons, Inc, Hoboken, New Jersey
- Mark F. Bear, Barry W. Connors, Michael Paradiso (2006) Neuroscience: Exploring the Brain, 3rd edition, Lippincott Williams and Wilkins publisher, Philadelphia, USA

Course Name: Pathogenesis, Tools and Techniques of Pulmonary Diseases

Course Code: YOG 808 **No. of Credits:** 4

Total Evaluation Marks: 100

Course Objectives

- Provide an advanced understanding of the anatomy and physiology of the pulmonary system.
- Analyze the molecular and cellular mechanisms underlying pulmonary diseases, including obstructive, restrictive, and infectious conditions.
- Explore diagnostic tools and techniques used in pulmonary medicine.
- Examine therapeutic and management approaches, including pharmacological, non-pharmacological, and emerging treatments for pulmonary diseases.

Course Outcomes

- Explain the anatomy and physiological functions of the pulmonary system and their role in maintaining respiratory health.
- Analyze the pathophysiology of various pulmonary diseases, including their molecular mechanisms and environmental influences.
- Evaluate diagnostic tools and techniques for assessing and diagnosing pulmonary diseases.
- Assess the therapeutic and management strategies used in treating pulmonary disorders, including novel regenerative medicine approaches.

Course Structure

Unit 1 (15 hrs)

Advanced Anatomy and Physiology of the Pulmonary System: Structural and functional anatomy of the respiratory system; Physiology of respiration (gas exchange, oxygen transport); Pulmonary circulation and ventilation-perfusion relationships; Neuroregulation of breathing; Surfactant structure and function; Developmental and age-related changes.

Unit 2 (15 hrs)

Pathophysiology of Pulmonary Diseases: Inflammatory and immune responses; Molecular and cellular mechanisms of lung injury; Pathogenesis of obstructive (Asthma, COPD) and restrictive (Pulmonary Fibrosis, Sarcoidosis) lung diseases; Genetic and environmental factors; Role of surfactant dysfunction; Microbiome impact.

Unit 3 (15 hrs)

Pulmonary Infections, Malignancies, and Diagnostic Techniques: Etiology and pathogenesis of pulmonary infections (bacterial, viral, fungal); Tuberculosis and pneumonia; Lung cancers (molecular basis, therapies); Diagnostic imaging (X-rays, CT, MRI, HRCT); Pulmonary function tests; Molecular diagnostics and biomarkers.

Unit 4 (15 hrs)

Therapeutics and Management of Pulmonary Diseases: Pharmacological treatments (bronchodilators, corticosteroids, biologics); Non-pharmacological management (pulmonary rehabilitation, oxygen therapy); Role of yoga and lifestyle interventions; Surfactant replacement therapies; Regenerative medicine (stem cell therapy, tissue engineering).

Suggested Readings:

- West, J. B. (2020). Respiratory Physiology: The Essentials. Lippincott Williams & Wilkins.
- Murray & Nadel's (2021). Textbook of Respiratory Medicine. Elsevier.
- Fishman, A. P. (2019). Fishman's Pulmonary Diseases and Disorders. McGraw-Hill.
- Weinberger, S. E. (2020). Principles of Pulmonary Medicine. Elsevier.
- Tissue Engineering for Lungs (2021). Advances in Regenerative Medicine for Pulmonary Disorders. Springer.

Course Name: Respiratory Physiology, Tools and Technique

Course Code: YOG 809 **No. of Credits:** 4

Total Evaluation Marks: 100

Course Objectives

- To provide an in-depth understanding of respiratory physiology.
- To introduce tools and techniques used in respiratory research.
- To study the impact of yogic practices on respiratory health.

Course Outcomes

- Understand the structure and function of the respiratory system.
- Analyze respiratory parameters using modern tools and techniques.
- Evaluate the effects of yoga practices on respiratory health.

Course Structure

Unit 1 (15 hrs)

Respiratory Physiology: Detailed anatomy of the respiratory system including nasal cavity, trachea, bronchi, lungs; Mechanics of breathing: inspiration, expiration, lung compliance; Gas exchange processes at alveolar and tissue levels; Oxygen and carbon dioxide transport mechanisms; Neural and chemical regulation of respiration; Pulmonary volumes and capacities with clinical relevance.

Unit 2 (15 hrs)

Respiratory Disorders: In-depth study of asthma, COPD, bronchitis, pneumonia, pulmonary fibrosis, respiratory muscle fatigue; Pathophysiology, clinical manifestations, diagnostic tests (spirometry, blood gas analysis), and contemporary management techniques including pharmacological and non-pharmacological interventions.

Unit 3 (15 hrs)

Tools and Techniques: Detailed analysis of respiratory tools including advanced spirometry techniques, peak expiratory flow meters, arterial blood gas analyzers, respiratory muscle strength testing devices, polysomnography setup and analysis, respiratory biofeedback systems, and emerging technologies in respiratory monitoring.

Unit 4 (15 hrs)

Yogic Practices and Respiratory Health: Comprehensive study of Pranayama techniques (Nadi Shodhana, Bhastrika, Kapalabhati, Anulom-Vilom, Ujjayi, Bhramari); Respiratory training through yoga and its impact on pulmonary functions; Research-based evidence on yoga as a therapeutic intervention for respiratory diseases; Case studies and clinical trials on yoga and respiratory physiology.

Suggested Readings

- Guyton and Hall *Textbook of Medical Physiology*
- John B. West. *Respiratory Physiology: The Essentials*
- Sharma, V. *Respiratory Physiology: A Clinical Approach*
- Nagendra HR. *Pranayama: The Science of Breath Control*
- Peer-reviewed journal articles and case studies on respiratory physiology and yogic interventions

Course Name: Yoga and Female Reproductive Health

Course Code: YOG 810 No. of Credits: 4

Total Evaluation Marks: 100

Course Objectives

- To provide an in-depth understanding of the anatomy and physiology of the female reproductive system.
- To explore the role of the hypothalamo-pituitary-ovarian (HPO) axis in reproductive health.
- To examine menstrual disorders like PMS and understand its etiology and epidemiology.
- To analyze the impact of yoga on PMS and its underlying mechanisms.

Course Outcomes

- Understand anatomical and physiological aspects of the female reproductive system, including the HPO axis, hormonal regulation, and menstrual cycle dynamics.
- Identify and analyze PMS based on its etiology, epidemiology, clinical symptoms, neurohormonal influences, and its impact on women's quality of life.
- Evaluate conventional and alternative management strategies for PMS, including pharmacological, dietary, lifestyle, and yoga-based interventions.

- Critically review scientific evidence on yoga for PMS management, demonstrate knowledge of relevant yoga practices, and suggest future research directions.

Course Structure

Unit 1 (15 hrs)

Anatomy and Physiology of Female Reproductive System: Overview of reproductive organs; hormonal regulation of the menstrual cycle; oogenesis; fertilization and implantation; role of ovarian hormones.

Unit 2 (15 hrs)

Hypothalamo-Pituitary-Ovarian (HPO) Axis: Anatomy and physiology; pulsatile GnRH and FSH/LH secretion; hormonal feedback loops; impact of lifestyle, diet, and exercise.

Unit 3 (15 hrs)

Premenstrual Syndrome (PMS): Definition, epidemiology, symptoms, etiology, pathophysiology, quality of life impacts, and conventional management.

Unit 4 (15 hrs)

Efficacy of Yoga on PMS and Its Mechanism: Evidence-based benefits, mechanisms (hormonal modulation, stress reduction, circulation), yoga practices, and research gaps.

Suggested Readings

- Khalsa, S. B. S., et al. (2021). *Principles and Practice of Yoga in Health Care*. Handspring Publishing.
- Guyton, A. C., & Hall, J. E. (2020). *Textbook of Medical Physiology*. Elsevier.
- Fishman, L. M., & Saltonstall, E. (2020). *Yoga for Osteoporosis and Women's Health*. W. W. Norton & Company.
- Telles, S., & Desiraju, T. (2021). *Scientific Perspectives on Yoga and Its Therapeutic Applications*. Springer.

Course Name: Cognitive Enhancement and Digital Wellbeing

Course Code: YOG 811 No. of Credits: 4

Total Evaluation Marks: 100

Course Objectives

- Understand how cognitive load, memory, and processing speed are affected by digital engagement.
- Identify the psychological effects of smartphone addiction on brain function and behaviours.
- Learn strategies to improve digital well-being and cognitive performance using ethical technology use.

Course Outcomes

- Explain the impact of digital habits on memory, attention, and decision-making.
- Analyse smartphone addiction and propose ways to reduce its negative effects.
- Develop personal and policy-based strategies for healthier digital usage.

Course Structure

Unit 1 (15 hrs)

Foundations of Cognitive Enhancement: Cognitive Load Theory (Intrinsic, Extraneous, Germane Load); Memory Systems (Sensory, Short-Term, Working, Long-Term); Processing Speed (Perceptual, Cognitive, Motor, Reading, Verbal, Decision-Making).

Unit 2 (15 hrs)

Digital Well-Being: Mindful technology use; screen time regulation; digital detox; sleep and blue light management; cybersecurity and digital privacy; ethical AI; digital mental health and focus strategies.

Unit 3 (15 hrs)

Psychological Aspects of Smartphone Addiction: Types—smartphone, social media, gaming, internet, nomophobia, phubbing, FOMO, texting, cyber-relationships, shopping, workaholism, streaming; psychological mechanisms—dopamine dysfunction, impulse control issues, cognitive overload.

Unit 4 (15 hrs)

Brain Psychology and Cognitive Regulation: Neuroplasticity, habit formation, attention, emotional regulation, brain-body connection, cognitive resilience, sleep and decision-making, yoga and mindfulness for cognitive control.

Suggested Readings

- Sweller, J., Ayres, P., & Kalyuga, S. (2011). *Cognitive Load Theory*. Springer.
- Eysenck, M. W., & Keane, M. T. (2015). *Cognitive Psychology: Mind and Brain* (1st ed.). Psychology Press.
- Montag, C., & Reuter, M. (2017). *Internet Addiction: Neuroscientific Approaches*. Springer.
- Griffiths, M. D., Kuss, D. J., & Pontes, H. M. (2018). *Internet and Mobile Phone Addiction: Health and Educational Effects*. IGI Global.
- Burr, C., Taddeo, M., & Floridi, L. (2020). *Designing for Digital Wellbeing*. Springer.

Course Name: Yoga for Sports Performances

Course Code: YOG 712 No. of Credits: 4

Total Evaluation Marks: 100

Course Objectives

- To provide a foundational understanding of key cognitive processes relevant to sports performance.
- To explain the basic anatomy and physiology of the cardiovascular system and its relationship to athletic performance.
- To examine the impact of yoga on cognitive functions crucial for athletic success.
- To analyze the influence of yoga on psychological factors and physical fitness components relevant to sports performance.

Course Outcomes

- Understand cognitive and cardiovascular foundations of sports performance.
- Evaluate yoga's impact on cognitive function and its application in sports.
- Analyze yoga's effects on psychological and physical fitness factors in athletes.
- Synthesize knowledge and apply yoga principles for sports performance enhancement.

Course Structure

Unit 1 (15 hrs)

Introduction: Cognition (definition, components, physiology); attention, concentration, memory (definition, types); neuromuscular coordination.

Unit 2 (15 hrs)

Cardiovascular Physiology: Basic anatomy and physiology of heart and blood vessels; blood pressure physiology (HRV, baroreflex sensitivity, RA axis); scientific findings on yoga and cardiovascular health.

Unit 3 (15 hrs)

Yoga and Cognition: Effects of yoga on memory, attention, concentration, executive function; research studies on yoga in athletes and cognitive performance.

Unit 4 (15 hrs)

Yoga, Psychological Outcomes and Physical Fitness: Yoga and competitive anxiety, sports confidence, perceived stress, emotion regulation; Yoga and balance, core stability, flexibility, endurance, strength; relevant scientific studies.

Suggested Readings

- Weinberg, R. S., & Gould, D. (2019). *Foundations of Sport and Exercise Psychology* (7th ed.). Human Kinetics.
- McArdle, W. D., et al. (2015). *Exercise Physiology: Nutrition, Energy, and Human Performance* (8th ed.). Wolters Kluwer.
- Ratey, J. J., & Hagerman, E. (2008). *Spark: The Revolutionary New Science of Exercise and the Brain*. Little, Brown and Company.

- Iyengar, B. K. S. (2005). *Light on Yoga*. Schocken.

Course Name: Yoga for Occupational Health

Course Code: YOG 813 No. of Credits: 4

Total Evaluation Marks: 100

Course Objectives

- To understand stress, its types, and its effects on health.
- To learn about occupational stress and its management.
- To explore methods for assessing stress.
- To study evidence-based stress management techniques like CBT and yoga.

Course Outcomes

- Understand the impact of stress on physical, mental, and social health.
- Identify causes and management strategies for occupational stress.
- Learn stress assessment tools like CPS, DASS-21, and biological markers.
- Apply evidence-based stress management techniques, including CBT and yoga.

Course Structure

Unit 1 (15 hrs)

Stress and Its Effects: Definition; neuro-hormonal basis of stress; types—eustress, distress; acute vs. chronic stress; effects on health and cognition; stress as a risk factor for physical and psychological disorders.

Unit 2 (15 hrs)

Occupational Stress: Definition and causes; risk factors; impact on job performance and productivity; strategies for stress reduction.

Unit 3 (15 hrs)

Assessment of Stress: Chronic stress symptoms; assessment via questionnaires (CPS, DASS-21); neurocognitive tools; biological stress markers.

Unit 4 (15 hrs)

Stress Management Techniques: Cognitive behavioral therapy (CBT)—introduction, steps, and procedures; yogic stress management techniques including relaxation, cyclic meditation, and Mind Sound Resonance Techniques (MSRT).

Suggested Readings

- Lazarus, R. S., & Folkman, S. (1984). *Stress, Appraisal, and Coping*. Springer Publishing.
- Nagarathna, R., & Nagendra, H. R. (2010). *Yoga for Stress Management*. Swami Vivekananda Yoga Publications.
- Bhargav, H. (2018). *Yoga for Stress and Anxiety Disorders*. Swami Vivekananda Yoga Publications.
- McEwen, B. S. (2002). *The End of Stress as We Know It*. National Academy of Sciences.
- Varambally, S., George, S., Srinivasan, T. M., & Bhargav, H. (2021). *The Science and Art of Yoga in Mental and Neurological Healthcare*. Jaypee Brothers Medical Publishers.
- American Psychological Association (APA). (2019). *Stress and Health: Research and Strategies for Managing Stress*. APA Publications.

Course Name: Tools and Techniques in Cognitive Science for Yoga Research

Course Code: YOG 814 **No. of Credits:** 4

Total Evaluation Marks: 100

Course Objectives

- To introduce students to the foundational concepts and theories of cognitive science as they relate to yoga.
- To familiarize students with various tools and techniques used in cognitive science research.
- To explore the cognitive effects of yoga through literature review and theoretical perspectives.
- To develop practical skills in assessing cognitive functions and mindfulness through behavioral experiments and self-report measures.

Course Outcomes

- Understand the relevance of cognitive science in yoga research.
- Design and conduct cognitive experiments and assessments.
- Critically analyze the cognitive effects of yoga based on current literature.
- Demonstrate proficiency in using cognitive assessment tools and self-report measures to evaluate cognitive functions and mindfulness.

Course Structure

Unit 1 (20 hrs)

Introduction to Cognitive Science in Yoga Research: Overview of cognitive science; key cognitive domains (attention, memory, perception, learning, decision-making, consciousness); cognitive effects of yoga from literature and theory.

Unit 2 (20 hrs)

Tools and Techniques in Cognitive Science: Behavioral experiments (Stroop Task, Sustained Attention Task, N-Back Test); tools (PEBL); self-report measures (Cognitive Failures

Questionnaire, mindfulness scales); executive function, emotion regulation, and stress assessments; experimental design.

Unit 3 (20 hrs)

Emerging Trends in Cognitive Science and Yoga: Neuroplasticity; brain imaging; EEG, ERP in meditation studies; cognitive rehabilitation; mind-body interventions; current insights and future research directions.

Suggested Readings

- Friedenberg, J., et al. (2021). *Cognitive Science: An Introduction to the Study of Mind*. SAGE Publications.
- Baars, B. J., & Gage, N. M. (2007). *Cognition, Brain and Consciousness: An Introduction to Cognitive Neurosciences*. Academic Press Inc.

Course Name: Opium Substance Use on Health and Tools and Techniques for Diagnosis and Assessments

Course Code: YOG 815 **No. of Credits:** 4

Total Evaluation Marks: 100

Course Objectives

- Provide an in-depth understanding of opium pharmacology and its historical context.
- Analyze the impact of chronic opium use on different physiological systems.
- Explore pathogenesis, comorbidities, and mechanisms of opium-induced diseases.
- Examine diagnostic tools and assessment techniques for substance use disorders and their effects.

Course Outcomes

- Describe the pharmacological properties and abuse patterns of opium, along with its historical and cultural relevance.
- Analyze the physiological and pathological effects of chronic opium use on multiple organ systems.
- Evaluate the pathogenesis and comorbidities associated with prolonged opium consumption.
- Apply diagnostic tools and techniques to assess and monitor substance use disorders effectively.

Course Structure

Unit 1 (15 hrs)

Introduction to Opium and Its Systemic Impact: History and pharmacology of opium; patterns of use and abuse; effects on cardiovascular and endovascular systems.

Unit 2 (15 hrs)

Effects of Chronic Opium Use on Major Organ Systems: Musculoskeletal, nervous, and digestive systems; associated impairments and disorders including gut dysbiosis.

Unit 3 (15 hrs)

Pathogenesis, Comorbidities, and Special Organ Systems: Reproductive, endocrine, and excretory systems; effects on special senses; disease pathogenesis and comorbidity analysis.

Unit 4 (15 hrs)

Diagnostic Tools, Assessment Techniques, and Future Directions: Neuropsychological, behavioral, physiological, and biochemical diagnostics; biomarkers and imaging; future research areas and emerging treatments.

Suggested Readings

- Kreek, M. J., et al. (2019). *Opioid Addiction and Its Treatment*. Springer.
- Kosten, T. R., & George, T. P. (2020). *The Neurobiology of Opioid Dependence*. Cambridge University Press.
- Lal, R., et al. (2021). *Substance Use Disorders in India*. Elsevier.
- Fields, H. L. (2019). *Opioid Pharmacology and Its Impact on the Human Body*. Oxford University Press.
- Rosenblum, A., & Parrino, M. W. (2022). *Clinical and Diagnostic Approaches in Opioid Use Disorder Treatment*. Academic Press.