

**NEP 2020**  
**Learning Outcome Based Curriculum**  
**Framework**  
**For**

**Ph.D. in Yogic Science**

**Department of Yoga,**  
**Central University of Rajasthan, Ajmer district,**  
**Rajasthan**

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## **BACKGROUND**

Considering the curricular reforms as instrumental for desired learning outcomes, all the academic departments of Central University of Rajasthan made an attempt to revise the curriculum of postgraduate programs in alignment with National Education Policy-2020 and UGC Quality Mandate for Higher Education Institutions-2021. The process of revising the curriculum could be prompted with the adoption of “Comprehensive Roadmap for Implementation of NEP-2020”. The Roadmap identified the key features of the Policy and elucidated the Action Plan with well-defined responsibilities and indicative timeline for major academic reforms.

The process of revamping the curriculum embarked with series of webinars and discussions conducted by the University. The faculties were oriented about the key features of the Policy, enabling them to revise the curriculum in synchronization with the Policy. The whole exercise was conceptualized to make it easier for them to appreciate and incorporate the vital aspects of the Policy in the revised curriculum focused on ‘creating holistic, thoughtful, creative and well-rounded individuals equipped with the key 21<sup>st</sup> century skills’ for the ‘development of an enlightened, socially conscious, knowledgeable, and skill in education’.

To ensure the implementation of curricular reforms envisioned in NEP-2020, the University decided to implement various provisions in a phased manner. Accordingly, the curriculum may be reviewed annually

## **INTRODUCTION ABOUT THE YOGA DEPARTMENT**

The department of Yoga was established in 2017 with an objective of adopting the Yoga therapy including the scientific components of Yoga in the university. In addition, the department will produce the scholars with best of research acumen in Yogic science.

## **PREAMBLE**

While there is large upsurge in research, documenting the health benefits and great attainments like experience of extra sensorial perceptions following yoga practices including meditation, efforts have been underway to understand the mechanisms of these benefits. Hence, the PhD programme in Yoga will start unravelling the hidden underlying mechanisms.

## **NAME OF THE PROGRAMME**

Doctorate in Philosophy – Yogic Science (PhD)

## **OBJECTIVES OF THE PROGRAMME**

PhD in Yogic science has been designed with the following objectives:

- To make the scholars learn the research methods, statistics, and advanced knowledge in analysis
- To make the scholars learn the skills of conceptualizing a novel idea for their research
- To instil substantial amount of knowledge so that they can record their data and interpret it for writing the results and discussion.
- To make a draft ready and send it for publication in the journal.
- To defend others with respect to the data he acquired, interpretation given and underlying mechanism established.

## **DURATION OF THE PROGRAMME**

Minimum of six semesters in three years

## **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**

Master degree of science 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 Yogic science

## **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**

Following the completion of PhD in Yogic science, students will acquire

- Knowledge of Yoga research, research methods and the instruments.
- Have in-depth idea about the principles, procedure and working mechanism of the research equipment.
- Hidden knowledge unraveled in Yoga and ancient sciences and its integration in Modern medical science.
- Appreciate the miracles brought about by Yoga.
- Understand Yoga in its totality..
- Skills to integrate yoga therapy with different systems of medicine and settings.

## **QUALIFICATION DESCRIPTORS**

Upon successful completion of the program, the students receive a PhD in Yogic science. They will be able to demonstrate knowledge as well as skills in diverse clinical disciplines of Yoga therapy. The knowledge they acquire will be useful in understanding the underlying mechanism behind the positive impact of Yoga in every dimension.

## **PROGRAM LEARNING OUTCOMES**

Following the completion of the program, the students will be able

- ✚ To unearth the hidden concepts of Yoga as described in Ancient texts and spiritual lore and put it forth for experimentation.
- ✚ To study the underlying mechanisms of various Yoga practices based on scientific experiments.
- ✚ To understand the science behind attainments of extraordinary experiences based on rigorous experiments.
- ✚ To carry out initial pilot trials and reproduce their findings by repeating the trial.
- ✚ To develop various experimental models based on the previous findings.
- ✚ To validate the diverse protocols and their implementation in clinical research and therapeutic use.

## **PROGRAM OUTCOMES**

**Basic and applied knowledge:** Interdisciplinary knowledge to find solution for diverse health complications.

**Problem analysis:** Ability to analyze a complication with the help of a specialist and develop a day wise protocol for the recovery of acute and chronic health conditions.

**Advanced Usage of Technology:** Ability to use the technology and understand the severity of a condition clinically and carry out a research trial effectively.

**Ethics:** Develop personal and professional ethics for carrying out the responsibilities in a smooth manner.

## **PROGRAM SPECIFIC OUTCOMES**

Following the completion of the program, students will be able to:

PSO-1 To understand the basic principles and applications of Yoga.

PSO – 2 To appreciate the importance of Yoga and its relevance in the society.

PSO – 4 To carry out the research trials using the modern scientific aids..

PSO – 5 To understand theoretical as well as practical aspects of Yoga and its related techniques to understand a diseases from every dimension.

PSO – 6 To record the vital physiological functions and interpret it as per the requirement of the science.

PSO –7 To have an in depth understanding about Statistics and analyze the results effectively

PSO – 8 To have substantial amount of knowledge in Medical sciences so that every physiological change recorded can be interpreted and an underlying mechanism can be conceptualized.

PSO-9 - To appreciate the principles of the Yoga and their techniques and how do those concepts get reflected in the disease manifestation and understanding how yoga play a vital role in the holistic management of the diseases.

PSO-10 - Integrating the principles of Yoga with modern scientific knowledge.

## COURSE MAPPING

### Mapping of the Program specific outcome and Core courses

PSO	CC 1	CC2	EL
PSO-1	√		
PSO-2	√	√	√
PSO-3	√		
PSO-4			
PSO-5	√	√	√
PSO-6			
PSO-7			
PSO-8	√		√
PSO-9	√		
PSO-10			√

## EVALUATION

**Continuous Internal assessment (CIA):** The theoretical courses will be assessed based on any or all of the following-written tests, assignments, presentations and regularity in the class. Assessment of the practical courses will be based on any or all of the following - regularity, practical records, procedure of the techniques taught, viva etc. The dissertation will be assessed based on the regular interaction with the supervisor, regular presentation of work, completion of assigned tasks, thesis submission, viva etc. The internal evaluation will be carried out throughout the term and it will comprise 40% of the final grade. Participation of students in quiz, seminar, workshop, games, yoga and other extra-curricular activities will be promoted and facilitated by the department.

**End Semester Examination (ESE):** The theoretical courses will be assessed based on written exam, which may be essay type and short notes. This will cover the entire syllabus. Assessment of the practical courses will be based on performing and/or description of experiments, maintaining of the practical records, viva etc. The dissertation will be assessed based on the thesis reported, viva etc. The end of semester examination comprises 60% of the final grade. Both internal and End semester evaluations will on offline mode only.

### Course Structure

Sl. No.	Course code	Title of the Courses	Credits
1.	EDU 601	Research Methodology and research ethics	4
2.	EDU XXX	Elective	4
3.	XXXXX	Pedagogy in Higher Education	4
		Total	12

### CORE COURSES

<b>Course Name: RESEARCH METHODOLOGY AND RESEARCH ETHICS</b>		<b>Course Code: EDU 601</b>
<b>Batch:</b> 2022	<b>Program:</b> PhD in Yogic Science	<b>Contact Hrs./Week: 04</b> <b>Total Hrs.: 60</b>
<b>Total Evaluation Marks: 100</b>		<b>Examination Duration: 3 Hrs.</b>
Continuous assessment (CA1) -20		End of Semester Examination (ESE) -60
Continuous assessment (CA1) -20		
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>✚ Making Research Methodology course palatable to a student to make him independent</li> <li>✚ Learning Research Ethics to ensure that every guideline drawn in research is fare and acceptable</li> </ul>	



<b>Course Outcomes</b>	<p>After completing this course, student is expected to learn the following:</p> <ul style="list-style-type: none"> <li>✚ Scholars will be able to conceptualize a search idea, refine it by reviewing the sufficient literature and make a plan of action to carry out their search trial</li> <li>✚ Scholars will be independent in obtaining the data, analysis and its interpretation</li> <li>✚ Scholars will be able to understand the Publication and research ethics</li> </ul>
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**SYLLABUS**

<b>Unit No.</b>	<b>Contents</b>	<b>Contact Hrs.</b>
<b>I</b>	<p><b>Foundations of Research:</b> 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 &amp; Formulation – Research Question – Investigation Question</p> <p>– Measurement Issues – Hypothesis – Qualities of a good Hypothesis – Null Hypothesis &amp; Alternative Hypothesis; Hypothesis Testing – Logic &amp; Importance;</p> <p><b>Research Design and Measurement Research Design:</b> 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 &amp; 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</p>	20
<b>II</b>	<p><b>Sampling and Data Analysis:</b> 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 &amp; Multi-stage sampling. Determining size of the sample – Practical considerations in sampling and sample</p>	20

	<p>size; Data Analysis: Data Preparation – Univariate analysis (frequency tables, bar charts, pie charts, percentages), Bivariate analysis – Cross tabulations and Chi-square test including testing hypothesis of association;</p> <p><b>Interpretation of data and Scientific writing:</b> 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; <b>Use of tools/techniques for Research:</b> methods to search required information effectively, Reference Management Software like Zotero / Mendeley, Software for paper formatting like LaTeX/MSOffice, Software for detection of Plagiarism</p>	
<b>III</b>	<p><b>Philosophy, ethics and scientific Conducts:</b> Introduction to philosophy: definition, nature and scope, concept, branches, Ethics :definition, moral philosophy, nature of moral judgments and reactions; Scientific conduct –Ethics with respect to science and research, Intellectual honesty and research integrity, Scientific misconducts: Falsification, Fabrication, and Plagiarism(FFP), Redundant publications: duplicate and overlapping publications, salami slicing and Selective reporting and misrepresentation of data; <b>Publication Ethics:</b> Publication ethics: definition, introduction and importance, Best practices /standards setting initiatives and guidelines: COPE&lt;WAME, etc., Conflicts of interest, Publication misconduct: definition, concept, problems that lead to unethical behaviour and vice versa, types, Violation of publication ethics, authorship and contributorship, Identification of publication misconduct, complaints and appeals, Predatory publishers and journals</p>	10
<b>IV</b>	<p><b>Open access Publishing and Publication misconduct:</b> Open access publication s and initiatives, SHERPA/RoMEO online resource to check publisher copyright &amp; self-archiving policies, Software tool to identify predatory publications; developed by SPPU, Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Sug; Publication misconduct – Group discussion: Subject specific ethical issues, FFP, authorship, Conflicts of interest; Software tools - Use of plagiarism software like Turnitin, Urkund and other open source software tools;</p> <p><b>Data base and research metrics:</b> Databases- Indexing databases, Citation</p>	10

	databases: Web of Science, Scopus, etc.; Research metrics - Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score; Metrics: h-index, g index, i10 index, alt metrics	
	<p><b>Suggested Readings:</b></p> <ul style="list-style-type: none"> <li>✚ Statistical Methods for Research Workers by Fisher R.A., Cosmo Publications, New Delhi ISBN:81-307-0128-6</li> <li>✚ Design and Analysis of Experiments by Montgomery D.C.(2001), John Wiley, ISBN:0471260088</li> <li>✚ 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</li> <li>✚ Ethics of Publication (2019). Subhash Chandra Lakhotia and Srinivasan Chandrasekaran; Indian National Science Academy, New Delhi 2019; ISBN: 978-81-939482-1-7</li> </ul>	

**‘PEDAGOGY OF HIGHER EDUCATION’ WILL BE OFFERED AS A  
COMPULSORY COURSE BY THE DEPARTMENT OF EDUCATION  
ELECTIVES TO BE OFFERED FROM THE RESPECTIVE  
SUPERVISERS**

<b>Course Name: Yoga and Cardiovascular Disease</b>		<b>Course Code: XXX</b>
<b>Batch:</b> 2022	<b>Program:</b> PhD in Yogic Science	<b>Contact Hrs/Week: 04</b> <b>Total Hrs.: 60</b>
<b>Total Evaluation Marks: 100</b>		<b>Examination Duration: 3 Hrs.</b>
Continuous assessment (CA1) -20		End of Semester Examination (ESE) -60
Continuous assessment (CA1) -20		
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>✚ To understand cardio-vascular physiology.</li> <li>✚ To learn about major cardiovascular diseases in detail.</li> </ul>	

	<ul style="list-style-type: none"> <li>✚ To learn yoga therapy for cardiovascular disease.</li> <li>✚ To study evidence based yoga for cardiovascular disease.</li> </ul>	
<b>Course Outcomes</b>	<p>After completing this course, student is expected to learn the following:</p> <ul style="list-style-type: none"> <li>✚ Anatomy and physiology of cardiovascular system.</li> <li>✚ Causes, clinical features and pathophysiology of cardiac disease.</li> <li>✚ Evidence based yoga for cardiovascular disease.</li> </ul>	
<b>SYLLABUS</b>		
<b>Unit No.</b>	<b>Contents</b>	<b>Contact Hrs.</b>
<b>I</b>	<b>Anatomy and Physiology of heart:</b> 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.	15
<b>II</b>	<b>Cardiovascular diseases:</b> Major cardiac diseases and their causes, clinical features and pathophysiology. Coronary artery disease, Ischemic heart disease, hypertension, and congestive cardiac failure.	15
<b>III</b>	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.	15
<b>IV</b>	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.	15
	<p><b>Suggested Readings:</b></p> <ul style="list-style-type: none"> <li>✚ Gerard J. Tortora, Bryan Derrickson (2014). Essentials of Anatomy and Physiology (1 st ed.), ISBN: 9788126544806, Wiley India Pvt Ltd.</li> <li>✚ K Sembulingam (2019), Essentials of Medical Physiology (8th ed.), ISBN-10:9352706927, Jaypee Brothers Medical Publishers</li> <li>✚ G K Pal and Parvati Pal (2016). Text book of Practical Physiology (1st edition), ISBN-10: 8173719969, The Orient Blackswan Publisher</li> <li>✚ G. Mohan and Indira Mohan (2004). Yoga Therapy: A Guide to the Therapeutic Use of Yoga and Ayurveda for Health and Fitness (1st edition), ISBN-10: 1590301315, Shambhala Publisher</li> </ul>	

<ul style="list-style-type: none"> <li>✚ R. Nagarathna and H. R. Nagendra (2008). Yoga for Hypertension (2nd edition), Swami Vivekananda Yoga Publications, Bangalore, India</li> <li>✚ R. Nagarathna and H. R. Nagendra (2008). Yoga for heart disease (2nd edition), Swami Vivekananda Yoga Publications, Bangalore, India</li> <li>✚ Indranil Basy Ray &amp; Darshan Mehta. Text Book of Principles and Practice of Yoga in Cardiovascular Medicine. Springer Nature. 2022.</li> </ul>
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<b>Course Name: YOGA AND MENTAL HEALTH</b>		<b>Course Code: XXXX</b>
<b>Batch:</b> 2022-2024	<b>Program:</b> PhD in Yogic Science	<b>Contact Hrs /Week: 04</b> <b>Total Hrs.: 60</b>
<b>Total Evaluation Marks: 100</b>		<b>Examination Duration: 3 Hrs.</b>
Continuous assessment (CA1) - 20		End semester examination (ESE) -60
Continuous assessment (CA1) - 20		
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>✚ To understand mental health and its importance.</li> <li>✚ To learn about common mental health problems.</li> <li>✚ To learn yoga therapy for various mental disorders.</li> <li>✚ To study evidence based yoga for mental disorders.</li> </ul>	
<b>Course Outcomes:</b>	After completing this course, student is expected to learn the following: <ul style="list-style-type: none"> <li>✚ Importance of Mental health.</li> <li>✚ Causes and clinical features of common mental disorders.</li> <li>✚ Evidence based yoga for mental disorders.</li> </ul>	
<b>SYLLABUS</b>		
<b>Unit No.</b>	<b>Contents</b>	<b>Contact Hrs.</b>
<b>I</b>	<b>Psychology:</b> Definition and relevance. Mind; conscious, sub-conscious and unconscious mind. Mind and Behavior. Importance of mental health, determinants of mental health. Mental health and quality of life. CBT, Meditation, and Planned behavior.	15
<b>II</b>	<b>Major mental disorders;</b> Anxiety, OCD, Phobia, depression, bipolar disease, schizophrenia and personality disorders. Conventional management techniques and their limitations.	15

<b>III</b>	Yoga and mental health: Yoga for mental relaxation, self-compassion, mindfulness, and self-esteem. Yoga and anxiety, OCD, depression, schizophrenia and bipolar disease	15
<b>IV</b>	Evidence based Yoga for mental disorders: Research findings in on yoga in anxiety, OCD, depression, addictions, schizophrenia and bipolar disease.	15
<p><b>Suggested Readings:</b></p> <ul style="list-style-type: none"> <li>✚ Charls Stongor. Introduction to Psychology. 978-1-77420-004-9</li> <li>✚ R. Nagarathna and H. R. Nagendra (2008). Yoga for Mental Disorders. Swami Vivekananda Yoga Publications, Bangalore, India.</li> <li>✚ Hemant Bhargav. Yoga for Depression. Swami Vivekanda Publications. 2016</li> <li>✚ Shivarama Varambally, Sanju George, TM Srinivasan, Hemant Bhargav . “The Science and Art Of Yoga In Mental And Neurological Healthcare”. Jaypee Brothers Medical Publishers, 05-Mar-2021</li> </ul>		

<b>Course Name: NEUROSCIENCE AND AUTOMIC FUNCTIONS</b>		<b>Course Code: XXX</b>
<b>Batch:</b> 2022- 2023	<b>Programme:</b> M.Sc. Yoga Therapy	<b>Contact Hrs/Week: 04</b> <b>Total Hrs.: 60</b>
Continuous Assessment - CA 1 -20		End of Semester Examination – ESE - 60
Continuous Assessment - CA 2 - 20		
<b>Total Evaluation Marks: 100</b>		<b>Examination Duration: 3 Hrs.</b>
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>✚ To understand the principles of Neuroscience with in depth understanding</li> <li>✚ To understand the Neurophysiological functions in detail with underlying mechanism</li> <li>✚ To have an understanding about the Neurophysiological techniques and Autonomic Nervous system</li> </ul>	

<b>Course Outcomes</b>	<p>After completing this course, will be able to</p> <ul style="list-style-type: none"> <li>✚ Explain the structure and functions of the Brain in detail.</li> <li>✚ Explain the Neurophysiological function such as Action potential, Resting potential etc.</li> <li>✚ Describe the principles and procedure of Neurophysiological techniques</li> <li>✚ Describe the principles and procedure of Autonomic function tests</li> </ul>
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**SYLLABUS**

<b>Unit No.</b>	<b>Contents</b>	<b>Contact Hrs.</b>
<b>I</b>	<b>Neuroanatomy:</b> 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	15
<b>II</b>	<b>Neurophysiology:</b> 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, head ach & referred pain. Vestibular apparatus & motion sickness. Integrative functions of thalamus, cerebellum, basal ganglia & Cerebral cortex. Blood brain barrier, Blood CSF barrier, Spit Brain, EEG	10
<b>III</b>	<b>Neurophysiological techniques:</b> Principles, procedure and working mechanism of Electro encephalogram (EEG), Evoked potentials (EP), Event related potentials (ERP), Trans cranial Doppler (TCD), Functional near infrared spectroscopy (fNIRS), Magneto encephalogram (MEG), Magnetic resonance imaging (MRI), Functional magnetic resonance imaging (fMRI). Computerized tomography (CT), Positron emission tomography (PET), and Single positron emission tomography (SPET)	15
<b>IV</b>	Autonomic Function tests: Principles, procedure and working mechanism of Electro cardio gram (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, 5<sup>th</sup> Edition, McGraw Hill Publisher, New York, USA
- ✚ Frank Amthor (2016) Neuroscience For Dummies, 2<sup>nd</sup> Edition, John Wiley & Sons, Inc, Hoboken, New Jersey
- ✚ Mark F. Bear, Barry W. Connors, Michael Paradiso (2006) Neuroscience: Exploring the Brain, 3<sup>rd</sup> edition, Lippincotts Williams and Wilkins publisher, Philadelphia, USA