



Department of Sports Science and Yoga

Ramakrishna Mission Vivekananda Educational and Research Institute
(Declared by Govt of India as Deemed University u/s 3 of UGC Act, 1956)
Belur Math, Howrah 711202, West Bengal

Two years full time M.Sc Yoga / M.A. Yoga 2019-2021 session

Course list – Semester I

Subject Code	Subject Name	Credits (theory)	Credits (practical)	Total Credits
Mandatory core courses				
MAY CT 101	Spiritual Heritage of India - I	3	0	3
MAY CT 102	Physiology of Yogic Practices (Theory)	4	0	4
MAY CP 102	Physiology of Yogic Practices (Practical)	0	1	1
MAY CT 103	Biomechanics and Kinesiology (Theory)	3	0	3
MAY CP 103	Biomechanics and Kinesiology (Practical)	0	1	1
MAY CT 104	Universal Peace Chants (from the Vedas and Upanishads)--I	3	0	3
MAY CP 105	Yoga practice	0	4	4
MAY CP 106	Communicative English - I	0	1	1
MAY CT 107	Comparitive Religion & Philosophy	2	0	2
	Total	15	7	22
Mandatory make up courses				
PGDY CT 109*	Sanskrit Language I	2	0	2
	Total	2	0	2

* Students, who do not have proficiency in basic Sanskrit, have to take **Sanskrit Language I** in the 1st semester and **Sanskrit Language II** in the 2nd semester, along with the PGDY regular batch. Any other student willing to take this course may also attend it.

Note: 1 cr Theory = 1 hour/week, 1cr Practical = 2 hours/week

DETAIL SYLLABUS – FIRST SEMESTER

Subject Code	Subject Name	Credits (theory)	Credits (practical)	Total Credits
MAY CT 101	Spiritual Heritage of India – I	3	0	3

Module 1: Vedas and Vedic Sages

Overview of the Vedas: Samhitas, Brahmanas, Aranyakas, Vedangas ,The Vedic gods, Selected Vedic Suktas

Module 2: Upanishads and Upanishadic Sages:

Overview of the Upanishads , Ishavasopanishad, Kathopanishad, Kenopanishad

Module 3: Sri Rama and Ramayana Tradition

Overview of Ramayana Traditions ,Valmiki and his Ramayana, Adhyatma Ramayana, Ramacharitmanas

Module 4: Vyasa and Mahabharata Tradition

Overview of Mahabharata, Important Selected Sections of Mahabharata, Vidura Neeti, Sanat Sujateeya, etc. ,Mahabharata Sages: Vyasa, Vishwamitra, Shukadeva, Ashtavakra, Dattatreya, etc.

Module 5: The Bhagavad-Gita: Overview of the Bhagavad-Gita

Module 6: Smriti Shastras:

Overview of the Smritis, Manu Smriti, The Tantras, Overview of the Tantras, Mahanirvana Tantra

Module 8: The Puranas

Overview of the Puranas ,Srimad Bhagavata Mahapurana, Sri Krishna Sages: Surdas, Mirabai, etc., Chandi

Module 9: Other Religions

Zorastrianism, Judaism, Christianity, Islam

Module 10: Vedanta-Acharyas:

Shankara, Ramanuja, Madhva, Saints of Bhakti Traditions, Bhakti Sutras

Module 11: The Ramakrishna Tradition

Sri Ramakrishna and His Gospel, Sri Sarada Devi and Her Message, Swami Vivekananda and His Works, Direct Disciples of Sri Ramakrishna

**** Note: The content given above will be covered in first and second semesters**

Subject Code	Subject Name	Credits (theory)	Credits (practical)	Total Credits
MAY CT 102	Physiology of Yogic Practices (Theory)	4	0	4

Unit-1 The concept of homeostasis and effect of yoga

Regulatory system of the body, characteristics of control systems, physiological basis of mind body medicine; Effect of yogic practices in setting up the internal environment of the body. Hypothalamo-hypophysial axis: Feedback regulation, Hypothalamus as a neuroendocrine organ, Releasing Factors, Tropic hormones of hypothalamus. Vascular and neural connections between the hypothalamus and the pituitary. circadian rhythm, Biorhythms of LH, FSH, Prolactin, Estrogen, Progesterone, ACTH GH, Cortisol. Light dark cycle and regulation of pineal hormone. Cardiovascular changes during horizontal, erect postures. Physiology of yoga as exercise and its effect on physical performance

Unit -2 Yogic breathing manuvres / Pranayama

Cardiovascular and respiratory changes during pranayama and other yogic breathing manuvres. Its long term effect. Role of different respiratory muscles in normal and forced inhalation and exhalation. Changing status of respiratory pump during yogic breathing manuvres as in pranayama and kriya. Peripheral and central chemo receptors. its sensitivity and effect of yoga on it and applications. Effect of Yogic breathing manuvres on lung volumes. Physiological mechanisms of Kevala, Antar and Bahir kumbhaka.

Unit -3 Kriyas

An overview of diffusion, osmosis, endo & exosmosis, active transport; significance of using salt during the practice of kriya; Tonicity of the solution such as hypotonic, hypertonic and isotonic solution and the impact of the same on physiology; peristalsis and mechanism of action. Effect of kriyas to facilitate peristalsis; opening and closing of sphincter; Possible mechanism of action of kriya practices in the activation of vagus nerve. Effect of kriya on gastric mucosa on digestive system ; Development of negative Pressure and the impact of sustenance of the negative pressure in body physiology.

Mechanism of urine formation: Concept of ultrafiltration, glomerular filtration rate, reabsorption by passive and active tubular transport. Concept of counter current system, counter current multiplier, exchanger and mechanism of concentrated urine formation. Renal function tests (inulin, urea clearance tests). Renal stone formation. Dialysis and artificial kidney. Innervations of urinary bladder and micturition, micturition reflexes and its regulation by higher centers. Brief idea about gall stones, achlorhydria, hyperchlorhydria, peptic ulcer, defecation reflex, vomiting reflex. Mechanism and control of gastric HCl secretion Metabolic pathway of glycolysis, gluconeogenesis, glycogenolysis, glycogenesis, TCA cycle, Cori cycle, beta-oxidation,

Basic concept of energy and units, calorific and physiological fuel value, respiratory quotient (RQ), Total energy expenditure (TEE), Basal metabolic rates (BMR) and Resting energy expenditure (REE), Specific dynamic action (SDA), physical activity ratio (PAR), Factors affecting BMR, consumption

Unit-4 Mudras, Bandhas and asanas

Types of joints and skeletal muscles in the body, mechanism of skeletal muscle contraction and relaxation, Isometric and isotonic contractions, Co activation of two antagonistic muscles, activation of nerve reflexes, Proprioceptive neuromuscular facilitation and their functional significance in movement in general and in Yogic practice. Mechanism of influence of sixtypes of asanas: stretching; pivoting, strengthening, inverted ; pressing; equilibration, reciprocal inhibition and innervation. Synergistic muscle activation during bandha practices. Effect of Bandhas on joint complexes; Central bandhas and co activation of opposing muscles in spinal joint complexes; Jalandhara bandha effects neck joint complexes; Uddiyan bandha effects upper joint complexes and Mool Bandhas for lower back joint complexes. Principles behind the practice of Mudra. Role of mudras on the body functions and its significance

TEXT BOOKS

- Anatomy of Hatha Yoga: A Manual for Students, Teachers, and Practitioners; Book by Herbert David Coulter; Publisher Body and Breath, 2001
- A Handbook for Yogasana Teachers: The Incorporation of Neuroscience, Physiology, and Anatomy by Mel Robin, Publisher: Wheatmark; 1 edition (15 May 2009)

REFERENCE BOOKS

- Simon Borg Olivier and Bianca Machiss; Applied Anatomy and Physiology of Yoga; 3rd edition, 2007.
- Clinical Anatomy: A Revision and Applied Anatomy for Clinical. Students , Harold Ellis, Blackwell Publishing, 2006
- Essentials of Pathophysiology: Concepts of Altered Health States Carol Mattson Porth, Lippincott Williams & Wilkins, 2006

Subject Code	<u>Subject Name</u>	Credits (theory)	Credits (practical)	Total Credits
MAY CP 102	Physiology of Yogic Practices (Practical)	0	1	1

- Measurement of arterial blood pressure at rest
- Measurement of peak expiratory flow rate by peak flow meter.
- Step test and determination of physical fitness.
- Measurement of pulse rate.
- Anthropometric parameters: Weight, stature, shoulder height. Knee height (sitting)
- Measurement of BMI, BSA.

Subject Code	Subject Name	Credits (theory)	Credits (practical)	Total Credits
MAY CT 103	Biomechanics & Kinesiology (Theory)	3	0	3

Unit 1: Introduction to Kinesiology and the principles of Biomechanics in Yoga

Meaning and Definition of Kinesiology ; Basic Biomechanical terms – [Displacement], velocity; acceleration; [Angular displacement], angular velocity; angular acceleration; Mass; [Weight], Pressure; Gravity; [CM and CG], Friction; work; Power; Energy; Torque; Bio mechanical description of movement of the human body; Kinematics and Kinetics; Kinetics – the [reason behind] forces [and torques] producing motion e.g. muscles, gravity; Kinematics – the description of motion e.g. type, location, direction, planes of movement; Type of displacement (movement); Location in space; Direction of movement; Magnitude of movement; Rate of movement; Importance of Kinesiology and Biomechanics for Yoga.

Unit 2: Fundamental Concept

Fundamental concepts of following terms – Axes and Planes, Centre of Gravity, Equilibrium, Line of Gravity; Fundamental movements at various joints; Fundamental concepts of the following terms – Angle of Pull, All or None Law, Reciprocal Innervations and inhibition; Stretch and postural reflex during the practice of Yoga postures; Force – Meaning, definition, types and its application to various Yoga postures; Lever – Meaning, definition, types and its application to human body; Newton’s Laws of Motion – Meaning, definition and its application to Yoga activities.

Unit-3 : Biomechanics of Hip and spine

Biomechanics of Hip Structure & function of the bones & non contractile element of the Hip, mechanics & patho-mechanics of muscle activity at the hip & analysis of the forces on the Hip during various Yoga postures; Biomechanics of Spine: Structure & function of the bones & joints of the cervical spine, mechanics & patho-mechanics of the cervical musculature, analysis of the forces on the cervical spine during activity, structure & function of the bones & joints of the thoracic spine, mechanics of the thoracic musculature, analysis of the forces on the thoracic spine during Yoga Postures & structure & function of the bones & joints of the lumbar spine. c. Mechanics of the lumbar musculature, analysis of the forces on the lumbar spine during Yoga postures, structure & function of the bones & joints of the pelvis, mechanics of the muscle activity in the pelvis & analysis of the forces on the pelvis during activity.

Unit-4: Biomechanics of Shoulder, elbow and wrist

Biomechanics of Shoulder: Structure & function of the bones & joints of the Shoulder complex, mechanics & patho-mechanics of the muscle activity in the Shoulder complex & analysis of the forces on the Shoulder complex during Yoga postures; Biomechanics of Elbow: Structure & function of the bones & no contractile element of the elbow, mechanics of muscle activity at the elbow & analysis of the forces on the elbow during Yoga postures; Biomechanics of Wrist & Hand Structure & function of the bones & joints of the wrist & hand, mechanics of the muscle activity in the wrist & hand, analysis of the forces on the wrist during activity, mechanics of the Special connective tissue in the hand

TEXT BOOKS

1. Hay, J.G. and Reid, J.G.: Anatomy, mechanics and human motion. Englewood Cliffs, N.J.: prentice Hall Inc. 1988.
2. Knudson, D.: Fundamentals of biomechanics. New York, NY: Springer, 2007

REFERENCE BOOKS

1. McGinnis, P.: Biomechanics of sport and exercise. Champaign, IL: Human Kinetics, 2013
2. Franc Bell: Principles of Mechanics and Biomechanics, Stanley Thornes Publications, 1998
3. Iwan W. Griffiths, Principles of Biomechanics & Motion Analysis, Published by Lippincott Williams & Wilkins, 2006

Subject Code	<u>Subject Name</u>	Credits (theory)	Credits (practical)	Total Credits
MAY CP 103	Biomechanics & Kinesiology (Practical)	0	1	1

1. Measurement and error
2. Distance and Displacement, Vectors and Scalars
3. Speed and Velocity measurement, concept of graph
4. Acceleration and Retardation - measurement and graphical representation
5. Measurement of acceleration due to gravity by simple pendulum
6. Young's modulus by Searle's apparatus
7. Modulus of rigidity by dynamical method
8. Concept of angular motion using rotating stool method
9. Moment of Inertia determination
10. Concept of center of gravity of regular and irregular solids
11. Center of gravity determination of a human body by segmental procedure, uses of graph paper
12. Friction, Co-efficient of friction
13. Momentum, conservation of momentum
14. Kinetic and potential energy determination by sliding toy-cars
15. Collisions = Elastic
16. Staircase climbing – Analysis for motion, Work done per unit time, Energy

Subject Code	<u>Subject Name</u>	Credits (theory)	Credits (practical)	Total Credits
MAY CT 104	Universal Peace Chants (from the Vedas and Upanishads)--I	3	0	3

Unit 1: The science of sound (*Shabda-Tattva*) and mystic syllables (mantras), Word and Meaning (*Shabda* and *Artha*), The *Sphota* Theory of Language, psycho-physiological benefits of mantra chanting. The Mantra OM and its meaning. Physiological aspects of chanting OM. Elements of Vedic Phonetics (*Siksha*)

Unit 2: Chanting of Universal peace chants from the Vedas (8 *shanti mantras*), meanings of shanti mantras

Reference Books

1. Coward, Harold G., *The Sphota Theory of Language: A Philosophical Analysis*, Delhi: Motilal Banarsidass, 1980.
2. Iyer, Subramania, K.A., *Bhartrihari. A Study of Vâkyapadîya in the Light of Ancient Commentaries*, Poona: Deccan College Postgraduate Research Institute, 1969,
3. Guy L. Beck, *Sonic Theology: Hinduism and Sacred Sound*, Motilal Banarsidass, 1995
4. Mantrapushpam, Ramakrishna Math, Khar, Mumbai

Subject Code	<u>Subject Name</u>	Credits (theory)	Credits (practical)	Total Credits
MAY CP 105	Yoga practice	0	4	4

Subject Code	<u>Subject Name</u>	Credits (theory)	Credits (practical)	Total Credits
MAY CP 106	Communicative English I	0	1	1

IELTS format of learning English - Speaking, Listening, Writing and Reading

Subject Code	<u>Subject Name</u>	Credits (theory)	Credits (practical)	Total Credits
MAY CT 107	Comparative Religion & Philosophy	2	0	2

Module 1- Basic Feature of Indian Philosophy (04 Hrs)

Module 2- A Brief Introduction to the History of Western Philosophy, An Introduction to the different Heterodox Traditions in Indian Philosophy (08 Hrs)

Module 3-, Carvaka Epistemology, Metaphysics, Carvaka Ethics and its similarity with Western Hedonism, Comparative Study of Carvaka Philosophy with the naturalistic trend in the philosophy of Pre Socratic Age, Jaina Epistemology, Metaphysics and Ethics (12 Hrs)

Module 4- A Study of the Pre-Socratic Age with special reference to the different philosophers of this age and a naturalistic overtone in their cosmological analysis (08 Hrs)

Module 1- A Study of the Buddhist School of Philosophy (06 Hrs)

Module 2- Introduction to Comparative Religion with its Nature, Aim and Objective, A Study of Zoroastrianism as a religion (08 Hrs)

Module 3- A Brief Introduction to the Socratic Age, Study of the Philosophies of Socrates, Plato and Aristotle (14 Hrs)

Module 4- Introduction to the Medieval Age, A study of the Philosophy of St. Augustine, Comparative study of the thought of Plato and St. Augustine (04 Hrs)

Module 1- A Study of the Philosophy of St. Thomas Aquinas and a comparative study of his thought with Aristotle (04 Hrs)

Module 2- An Introduction to the Modern Age in Western Philosophy with the Philosophy of Rene Descartes, A study of the similarity of thought of Rene Descartes with Socrates in emphasizing the role of reason in philosophical analysis, An Introduction to the Religions of Abrahamic Faith, An Introduction to Judaism as a religion (12 Hrs)

Module 3- An Introduction to the Nyaya Vaisesika School of Indian Philosophy (08 Hrs)

Module 4- Similarity of Vaisesika Paramanuvada with the ideas of the Atomists of the Pre Socratic Age, An Introduction to the Philosophy of John Locke (08 Hrs)

Module 1- An Introduction to the Samkhya and Yoga School of Indian Philosophy (10 Hrs)

Module 2- An Introduction to Christianity as a religion (06 Hrs)

Module 3- The Philosophy of Benedict de Spinoza and the similarity of his concept of Abstract Monism with that of Plato, The Philosophy of Gottfried Wilhelm Leibnitz, A study of the similarity of thought of Leibnitz and Jaina tradition in respect of their cosmological analysis (10 Hrs)

Module 4- An Introduction to the Philosophy of George Berkeley (06 Hrs)

Module 1- An Introduction to the Philosophy of David Hume (06 Hrs)

Module 2 – An Introduction to Islam as religion (08 Hrs)

Module 3- An Introduction to Mimamsaka and Vedanta Philosophical traditions (12 Hrs)

Module 4- Similarity of thought of in the Religions of Abrahamic Faith in respect of the concept of resurrection, idea of heaven and hell, concept of evil and some subtle differences of thought in these religions in respect of the nature of God (06Hrs)

Module 1- Jainism and Buddhism as a religion (10 Hrs)

Module 2- Sikhism and Hinduism as a religion (10 Hrs)

Module 3- Appraisal of the eight (08) World Religions, A study of the Transcendental Philosophy of Kant for overall synthesis of the views of different philosophers of Western Philosophy and Indian Philosophical tradition (06 Hrs)

Module 4- Synthesis and Harmony of thought in Ramakrishna and Vivekananda Philosophy (06 Hrs)
