

## Mapping of Course Outcomes with Program Outcomes

### Program Outcomes of M.Sc Sports Biochemistry

PO1	The main objective of this program is to train manpower who can understand basic functional role of biomolecules, kinesiology, psychology, nutrition, metabolism, anatomy, various systems of the human body and its kinematics, Sports biochemistry experiments, measurements, assessment of performance in sports and the instruments required for various analysis in sports biochemistry.
PO2	To train students who are capable to perform biochemical analysis in sports field, and with knowledge applicative sports biochemistry
PO3	Be able to frame a scientific question, undertake investigations, perform analyses and help to solve Sports biochemical problems.
PO4	Be able to demonstrate accurate quantitative analysis, computer literacy, communicate effectively about the results of scientific investigations, effectively apply scientific ethics, locate, obtain, read, and understand appropriate scientific literature and evaluate scientific arguments critically.
PO5	Be able to describe basic component of biochemistry, Recognizes oxidation and reduction reactions, define organic compounds, knowledge about exercise and oxidative stress, Knowledge about molecular biology, Drugs and Doping etc.
PO6	Direct training by utilizing scientific approaches, Specialize in specific study fields related to Sports Biochemistry, knows the legal regulations related to the profession of Sports Biochemistry, Plans, implements and develops sport biochemistry testing strategy. follow national and international developments in the Sports Biochemistry field, and develop themselves personally and professionally

### M.Sc. Sports Biochemistry

Course Code	Course Title	PO1	PO2	PO3	PO4	PO5	PO6
<b>Theory Courses</b>							
MSSB 101	Human Anatomy and Physiology	1	2	3	3	1	1
MSSB 102	Biomolecules and Metabolism	3	3	3	2	1	1
MSSB 103	Food and Nutrition	1	2	2	3	3	1
MSSB 104	Introduction to biomechanics	1	1	2	3	3	2
MSSB 105	Practicum – I	3	3	3	1	1	1
MSSB 106	Practicum – II	3	3	3	2	1	1
MSSB 201	Kinesiology	2	3	2	3	1	1
MSSB 202	Psychological and Social Aspects of Sports	1	3	1	3	2	3
MSSB 203	Principles and methods of Sports Training	3	3	3	2	1	1
MSSB 206	Practicum – III	2	3	3	3	2	1
MSSB 207	Practicum – IV	1	2	3	3	3	1
MSSB 301	Sports and Exercise Metabolism	2	2	3	3	3	1
MSSB 302	Instrumentation & Analytical Technique	3	3	3	2	2	1
MSSB 306	Practicum – V	1	3	3	3	2	1
MSSB 307	Practicum – VI	1	3	1	2	3	3
MSSB 403	Major Project	2	3	2	2	3	1
<b>Discipline Elective Courses</b>							
	Fatigue, Injuries and Rehabilitation	1	2	3	3	1	1
	Essentials of Sports	3	2	3	2	1	1
	Kinanthropometry	3	3	2	3	1	1
	Adaptations to Exercise and Training	1	3	3	3	2	1
	Research Methodology	1	1	3	3	3	2
	Drugs and Doping in sports	1	3	1	2	3	3
	Medical Biochemistry	2	3	3	3	2	1
	Genetics in Sports Performance	1	3	2	3	2	1
	Essentials of Molecular Biology	1	3	3	3	2	1
	Biochemical Aspects of Health in Sports	2	3	3	2	3	1
	Nutritional Biochemistry	2	3	2	3	1	1
	Endocrinology in Sports	2	3	3	2	2	2
	Immunology in Sports Training	2	3	3	2	1	3
	Statistics for Sports Science	3	2	3	2	3	1

### **Program Outcomes of M.Sc Sports Nutrition**

PO1	Be able to know the detailed knowledge of the metabolism of nutrients and of nutritional requirements in humans, understand current theories of the relationships between diet and performance in sport, and between diet, exercise and health, links between human nutrition and metabolism during exercise
PO2	Be able to understand the practical issues involved in setting nutritional goals and translating these into eating strategies, links between nutrition and performance in sport and exercise, Dietary practices adopted by athletes in various sports and at different levels of competition, nutritional impact on the brain, bone, connective tissue and immune function as it applies to athletes.
PO3	Be able to grow knowledge in general metabolic principles, primarily fuel sources for the working muscle during exercise, current intake and develop a sport nutrition plan based on type of sport and goals, translate sports nutrition research into practical applications for athletes, and be able to effectively communicate verbally, in written form, and using digital platforms
PO4	Be able to develop the knowledge of the macronutrient principles of sports nutrition for different types of athletes based on their goals, specifically related to energy and recovery, Knowledge and experience of different methods of assessing relevant parameters of nutrition, health and fitness relating , Practical experience of methods of communicating nutrition to athletes, coaches and parents, The ability to evaluate supplements and nutraceutical products that may be used as performance enhancers – including any legal consideration around their usage.
PO5	Be able to know the knowledgeable of hydration guidelines for safety and performance and know how to evaluate and monitor hydration status, Be familiar with the micronutrient needs of athletes and which bioactive food components (antioxidants, polyphenols) are beneficial, evaluate dietary supplements for effectiveness and safety
PO6	Be educate the students in research methods relevant to the study of sports nutrition, written communication of original scientific material, principles that govern the translation of nutritional goals into dietary strategies, Understand the role of nutrition in recovery from injury, techniques to safely and effectively monitor and alter weight and body composition

### M.Sc. Sports Nutrition

Course Code	Course Title	PO1	PO2	PO3	PO4	PO5	PO6
<b>Theory Courses</b>							
MSSN 101	Human Anatomy and Physiology	1	2	3	3	1	1
MSSN 102	Biomolecules and Metabolism	3	3	3	2	1	1
MSSN 103	Food and Nutrition	1	2	2	3	3	1
MSSN 104	Introduction to biomechanics	1	1	2	3	3	2
MSSN 105	Practicum – I	3	3	3	1	1	1
MSSN 106	Practicum – II	3	3	3	2	1	1
MSSN 201	Kinesiology	2	3	2	3	1	1
MSSN 202	Psychological and Social Aspects of Sports	1	3	1	3	2	3
MSSN 203	Principles and methods of Sports Training	3	3	3	2	1	1
MSSN 206	Practicum – III	2	3	3	3	2	1
MSSN 207	Practicum – IV	1	2	3	3	3	1
MSSN 301	Dietary Supplements and Ergogenic Aids	1	3	2	3	3	1
MSSN 302	Sports Specific Nutrition	1	3	3	2	2	1
MSSN 306	Practicum – V	1	3	2	3	3	1
MSSN 307	Practicum – VI	1	2	3	2	3	3
MSSN 403	Major Project	1	1	2	3	2	3
<b>Discipline Elective Courses</b>							
	Fatigue, Injuries and Rehabilitation	1	2	3	3	2	1
	Essentials of Sports	3	2	2	2	2	1
	Kinanthropometry	1	2	3	3	1	1
	Health Fitness and Wellness	1	3	3	2	1	1
	Research Methodology	1	1	2	3	3	3
	Assessment of Health and Fitness of Athletes	1	2	2	3	3	2
	Nutrigenomics	3	2	3	2	1	1
	Food safety and Standardization	1	2	1	3	3	3
	Adaptations to Exercise and Training	1	3	3	2	3	1
	Therapeutic Sports Nutrition	1	3	2	3	3	2
	Food Psychology and counselling	2	3	3	2	1	1
	Nutritional Biochemistry	1	3	2	3	1	2
	Exercise Physiology	3	3	3	1	2	1
	Statistics for Sports Science	3	3	3	3	1	1

### **Program Outcomes of M.Sc Sports Physiology**

<b>PO1</b>	Be able to develop and use their knowledge in the field of Exercise physiology in an integrated manner; Acquire and imbibe the skills required in Exercise physiology for application in real life situations like training camps, education programmes for athletes; Demonstrate knowledge of general overall physiological principles associated with metabolic processes; musculoskeletal system; cardiovascular system; aerobic and anaerobic program design. Pathophysiology and risk factors associated with exercise and disease.
<b>PO2</b>	Be able to Develop aptitude for multidisciplinary approach for working in close cooperation with coaches, scientists from other specializations and High Performance Team.
<b>PO3</b>	Be able to Develop good research-oriented attitude and be able to formulate a research problem, plan and implement projects based on the problem area, recognize and apply results within a specific sport or within the field of specialization.
<b>PO4</b>	Be able to carry out physiological testing on various sports groups and deliver support to the coaches and athletes, be well conversant with the process of training, training camps, training cycles, competition cycles and the likes. Be able to critically analyze and handle complex situations in sporting activities arising during the Long Term Athlete Development Program.
<b>PO5</b>	Be able to Assess and evaluate nutritional intake and demonstrate the ability to design weight management programs. Demonstrate knowledge of safety, injury prevention, and emergency procedures associated with laboratory activities and general exercise. Demonstrate knowledge of cardiovascular physiology, pulmonary physiology, metabolic processes and associated pathology and risk factors for disease. Demonstrate knowledge of orthopedic/musculoskeletal issues including pathophysiology and risk factors for injury. Demonstrate proficiency in performing laboratory techniques and subsequent analysis of data commonly used in Human Performance Laboratory.
<b>PO6</b>	Be competent to analyze and apply current development and research works in the field of sport science. Be able to welcome new ideas and have capability thinking in out of box Demonstrate the ability to administer and interpret health appraisals, fitness, and clinical exercise testing. Electrocardiography and other diagnostic techniques associated with physiological processes. Design and monitor exercise prescriptions and fitness programming

### M.Sc. Sports Physiology

Course Code	Course Title	PO1	PO2	PO3	PO4	PO5	PO6
<b>Theory Courses</b>							
MSSP 101	Human Anatomy and Physiology	1	2	3	3	1	1
MSSP 102	Biomolecules and Metabolism	3	3	3	2	1	1
MSSP 103	Food and Nutrition	1	2	2	3	3	1
MSSP 104	Introduction to biomechanics	1	1	2	3	3	2
MSSP 105	Practicum – I	3	3	3	1	1	1
MSSP 106	Practicum – II	3	3	3	2	1	1
MSSP 201	Kinesiology	2	3	2	3	1	1
MSSP 202	Psychological and Social Aspects of Sports	1	3	1	3	2	3
MSSP 203	Principles and methods of Sports Training	3	3	3	2	1	1
MSSP 206	Practicum – III	2	3	3	3	2	1
MSSP 207	Practicum – IV	1	2	3	3	3	1
MSSP 301	Fatigue, Injuries and Rehabilitation	3	2	3	2	1	1
MSSP 302	Physiological Support for Athletes	1	2	1	3	3	3
MSSP 306	Practicum – V	1	3	3	2	3	1
MSSP 307	Practicum – VI	1	3	2	3	3	2
MSSP 403	Major Project	2	3	3	2	1	1
<b>Discipline Elective Courses</b>							
	Fatigue, Injuries and Rehabilitation	2	3	2	3	3	1
	Essentials of Sports	✓	3	3	1	3	1
	Kinanthropometry	2	3	2	3	1	2
	Health Fitness and Wellness	2	3	3	3	1	1
	Research Methodology	1	1	3	1	3	3
	Adaptations to Exercise and Training	1	2	3	2	1	1
	Exercise and Environmental Physiology	3	3	3	1	2	1
	Performance Evaluation and Testing	1	3	1	3	3	2
	Sports Specific Nutrition	2	3	3	3	1	2
	Physiology of Sports and Exercise	3	3	2	3	1	1
	Sports Ergonomics	1	1	1	3	2	3
	Statistics for Sports Science	1	3	2	3	2	1
	Endocrinology in Sports	1	3	3	3	1	1