University of Mumbai

No. AAMS_UGS/ICC/2024-25/81

CIRCULAR:-

Attention of the Principals of the Affiliated Colleges, Directors of the Recognized Institutions and the Head, University Departments is invited to this office circular No. AAMS_UGS/ICC/2023-24/23 dated 08th September, 2023 relating to the NEP UG & PG Syllabus.

They are hereby informed that the recommendations made by the **Ad-hoc Board of Studies in Home Science** at its meeting held on 04th July, 2024 and subsequently passed by the Board of Deans at its meeting held on 10th July, 2024 **vide** item No. 8.13 (N) have been accepted by the Academic Council at its meeting held on 12th July, 2024 **vide** item No. 8.13 (N) and that in accordance therewith the **syllabus** for the **M.Sc (Home Science-Sport Nutrition) (Sem. III & IV)** is introduced as per appendix (NEP 2020) with effect from the academic year 2024-25.

(The circular is available on the University's website www.mu.ac.in).

Baliram

(Prof.(Dr) Baliram Gaikwad)
I/c Registrar

MUMBAI – 400 032
20th August, 2024

To

The Principals of the Affiliated Colleges, Directors of the Recognized Institutions and the Head, University Department.

A.C/8.13(N)/12/07/2024

Copy forwarded with Compliments for information to:-

1) The Chairman, Board of Deans,
2) The Dean, Faculty of Interdisciplinary,
3) The Chairman, **Ad-hoc Board of Studies in Home Science**,
4) The Director, Board of Examinations and Evaluation,
5) The Director, Board of Students Development,
6) The Director, Department of Information & Communication Technology,
7) The Director, Institute of Distance and Open Learning (IDOL Admin), Vidyanagari.
8) The Deputy Registrar, Admissions, Enrolment, Eligibility & Migration Department (AEM),

Copy forwarded for information and necessary action to :-	
1	The Deputy Registrar, (Admissions, Enrolment, Eligibility and Migration Dept)(AEM), dr@eligi.mu.ac.in
2	The Deputy Registrar, Result unit, Vidyanagari drresults@exam.mu.ac.in
3	The Deputy Registrar, Marks and Certificate Unit,. Vidyanagari dr.verification@mu.ac.in
4	The Deputy Registrar, Appointment Unit, Vidyanagari dr.appointment@exam.mu.ac.in
5	The Deputy Registrar, CAP Unit, Vidyanagari cap.exam@mu.ac.in
6	The Deputy Registrar, College Affiliations & Development Department (CAD), deputyregistrar.uni@gmail.com
7	The Deputy Registrar, PRO, Fort, (Publication Section), Pro@mu.ac.in
8	The Deputy Registrar, Executive Authorities Section (EA) eau120@fort.mu.ac.in He is requested to treat this as action taken report on the concerned resolution adopted by the Academic Council referred to the above circular.
9	The Deputy Registrar, Research Administration & Promotion Cell (RAPC), rapc@mu.ac.in
10	The Deputy Registrar, Academic Appointments & Quality Assurance (AAQA) dy.registrar.tau.fort.mu.ac.in ar.tau@fort.mu.ac.in
11	The Deputy Registrar, College Teachers Approval Unit (CTA), concolsection@gmail.com
12	The Deputy Registrars, Finance & Accounts Section, fort draccounts@fort.mu.ac.in
13	The Deputy Registrar, Election Section, Fort drelection@election.mu.ac.in
14	The Assistant Registrar, Administrative Sub-Campus Thane, thanesubcampus@mu.ac.in
15	The Assistant Registrar, School of Engg. & Applied Sciences, Kalyan, ar.seask@mu.ac.in
16	The Assistant Registrar, Ratnagiri Sub-centre, Ratnagiri, ratnagirisubcentar@gmail.com
17	The Director, Centre for Distance and Online Education (CDOE), Vidyanagari, director@idol.mu.ac.in
18	Director, Innovation, Incubation and Linkages, Dr. Sachin Laddha pinkumanno@gmail.com
19	Director, Department of Lifelong Learning and Extension (DLLE), dlleuniversityofmumbai@gmail.com

Copy for information :-	
1	P.A to Hon'ble Vice-Chancellor, vice-chancellor@mu.ac.in
2	P.A to Pro-Vice-Chancellor pvc@fort.mu.ac.in
3	P.A to Registrar, registrar@fort.mu.ac.in
4	P.A to all Deans of all Faculties
5	P.A to Finance & Account Officers, (F & A.O), camu@accounts.mu.ac.in

To,

1	The Chairman, Board of Deans pvc@fort.mu.ac.in
2	**Faculty of Humanities,** **Dean** 1. Prof.Anil Singh Dranilsingh129@gmail.com **Associate Dean** 2. Dr.Suchitra Naik Naiksuchitra27@gmail.com 3.Prof.Manisha Karne mkarne@economics.mu.ac.in
	Faculty of Commerce & Management, **Dean** 1. Dr.Kavita Laghate kavitalaghate@jbims.mu.ac.in **Associate Dean** 2. Dr.Ravikant Balkrishna Sangurde Ravikant.s.@somaiya.edu 3. Prin.Kishori Bhagat kishoribhagat@rediffmail.com

	Faculty of Science & Technology **Dean** 1. Prof. Shivram Garje ssgarje@chem.mu.ac.in **Associate Dean** 2. Dr. Madhav R. Rajwade Madhavr64@gmail.com 3. Prin. Deven Shah sir.deven@gmail.com
	Faculty of Inter-Disciplinary Studies, **Dean** 1.Dr. Anil K. Singh aksingh@trcl.org.in **Associate Dean** 2.Prin.Chadrashekhar Ashok Chakradeo cachakradeo@gmail.com
3	Chairman, Board of Studies,
4	The Director, Board of Examinations and Evaluation, dboee@exam.mu.ac.in
5	The Director, Board of Students Development, dsd@mu.ac.in DSW direcotr@dsw.mu.ac.in
6	The Director, Department of Information & Communication Technology, director.dict@mu.ac.in

AC-12/07/2024
Item No. – 8.13 (N)

As Per NEP 2020

University of Mumbai

Title of the program

M.Sc. (Home Science – Sports Nutrition)

Syllabus for

Semester – Sem. - III & IV

Ref: GR dated 16th May, 2023 for Credit Structure of PG

(With effect from the academic year 2024-25)

University of Mumbai

(As per NEP 2020)

Sr. No.	Heading	Particulars
1	**Title of program** **O:_____ B**	**M.Sc. (Home Science – Sports Nutrition)**
2	**Scheme of Examination** **R: _____**	NEP 50% Internal 50% External, Semester End Examination Individual Passing in Internal and External Examination
3	**Standards of Passing** **R: _____**	40%
4	**Credit Structure** **R: IMP - 90A** **R: IMP - 90B**	Attached herewith
5	**Semesters**	Sem. III
6	**Program Academic Level**	6.5
7	**Pattern**	Semester
8	**Status**	New
9	**To be implemented from Academic Year**	2024-25

Sign of the BOS Chairman
Name of the Chairman
BOS in Home Science

Sign of the Offg. Associate Dean
Name of the Associate Dean
Faculty of

Sign of the Offg. Associate Dean
Name of the Associate Dean
Faculty of

Sign of the Offg. Dean
Name of the Dean
Faculty of

Preamble

1) Introduction

In the 1970s, the understanding of the interrelationships between diets and incidence and progressionof chronic degenerative disease increased globally along with the realization that nutrition and lifestyle can impact the long-term health of the nation. It was then that the college of Home Science instituted the department of Foods and Nutrition in 1972 and started the M.Sc. programme in Foods and Nutrition which was later expanded to a M.Sc. in Foods, Nutrition and Dietetics. The postgraduates of this programme are skilled in all arms of the subject and find employability in positions in the food industry, clinical nutrition and public health nutrition.

It was in the 1980s that exercise physiologists worked on the role of nutrition primarily for improved performance of endurance sports and in the 1990s and 2000s, the scope of nutrition in resistance sports and other sports for bettered performance was studied. Keeping the necessity of the changing times and for addressing the need for nutritional guidance for sportspersons in India and to support our sportspersons' performance, the M.Sc. programme in Sports nutrition was started in 2010.

In the current times, the field of Sports Nutrition has increased in its scope with the advent of specialised branches and its effect on optimizing performance in sports. Whilst genetic advantages, and the training and efforts put in will impact performance, the role of correct nutrition during trainingas well as pre and post-game and in between matches can be the game changers between a win and aloss. The nutritional requirements change with the type of sports – from endurance to team sports to resistance and power sports. The nutritional requirements are different for sportspersons of differentage groups and those need to be addressed.

Over the last two years, India has made significant strides in the international sports arena, showcasing its prowess and determination across a wide range of disciplines. Cricket has been a sportIndia excels in and in the current times we have expanded our achievements in many other sports. In2021, Olympic glory was achieved where India recorded its best-ever medal haul at the Olympics, securing a total of 7 medals, including 1 gold, 2 silver, and 4 bronze medals. The historic gold in javelin throw captured the nation's attention while successes in wrestling, badminton, and weightlifting highlighted India's diverse sporting talents.

India's achievements over the last two years serve as a foundation for future growth in the international sports arena. The government's focus on the Fit India movement, increased investment in sports infrastructure, and emphasis on grooming young talents can contribute to a more robust anddiverse sporting landscape. This when combined with the power of nutrition as a fuel to optimize performance can catapult India into the big league of sports achievements.

It is with this background that the M.Sc. in Sports Nutrition has been restructured as per the guidelinesand the goals of the National Education Policy 2020. This programme is designed to create sports nutrition professionals who are intensely trained to attain proficiency in advanced and specialized subjects in the field of sports nutrition. It offers a deep understanding of how nutrition needs to be designed for different kinds of sports with both theoretical and practical inputs. Today, with the hugenumber of sports options available like endurance sports, power sports, team sports and resistance sports with each one of them having specific requirements there arises a need to train more sports nutritionists in the newest aspects of sports nutrition.

The mandatory course work includes concepts of exercise physiology, kinesiology, biochemistry, nutritional and fitness assessment will help the students to acquire a strong foundation in sports nutrition and be able to efficiently practice it in the field.

The elective courses have been designed to provide an opportunity to train learners in the contemporary aspects of sports nutrition. It will give them an opportunity to look at fitness management in a multi-faceted manner and use complementary health strategies to manage their Client. The electives also include entrepreneurship and innovation as a focus as well as there is emphasis placed on the use of technology in sports nutrition.

The course in research methods and statistics will enable the students to interpret recent advances in sports nutritional science and provide them with skills for designing and conducting research. This is a programme is designed to create professionals competent in managing nutrition of sportspersons and to take the nation's sports to a higher, more evolved level. It will lead to the sports nutritionist serving as a cornerstone for the holistic development of sportspersons, ensuring athlete wellbeing and enhancing sports performance. As the sports landscape continues to evolve, the significance of sports nutrition professionals remains paramount in realising the full potential of the sportspersons.

2) Aims and Objectives

b. To equip students with the knowledge of food components essential in the sports industry for fitness and good body composition.
c. To impart to the students a systematic approach to basic and applied aspects of fitness nutrition and optimum body composition using a multi-disciplinary approach.
d. To familiarize students with the various theoretical and practical aspects of the nutritional requirements of sports nutrition based on the type of sport.
e. To encourage students to work in conjunction with relevant sports industry to get a deep insight into the subjects of sports and fitness.
f. To help the students build their research competencies and be able to use the research in the fieldof sports nutrition.
g. To foster an entrepreneurial mindset in students in the sports industry, enabling them to identify and seize opportunities within the industry, develop innovative coaching programmes and create sustainable ventures in the field.

3) Learning Outcomes

The program encompasses a comprehensive range of skills and knowledge, values and mind-set, enablinggraduates to excel in the multifaceted field of Sports Nutrition. On successful completion of the program, student will be able to be a competent and valuable member of the fraternity as outlined below:

Programme Outcome (PO)	Definition	Graduate Attribute
	On completion of the programme, the learner will be able to	
PO1	Demonstrate an in-depth knowledge and understanding of core fundamentals of concepts of Sports Nutrition, Fitness Nutrition and Public Health with the integration of all allied subjects required to professionally practice in the area of Sports Nutrition competently	Disciplinary Knowledge
PO2	Effectively develop nutritious and sustainable food products, communicate fitness diets, counsel athletes effectively and explain complex nutritional concepts in simple and understandable terms both orally and in writing to fellow professionals as well as the community	Communication Skills
PO3	Have a capacity to derive efficient methods of meal plans based on the type of the sport and individual and evaluate themodes of nutritional therapies as well as programmes to better health in the sports community.	Critical Thinking
PO4	Creatively construct Dietary, Nutritional and Lifestyle strategies to preserve fitness in health, manage stress, address nutrition related health issues in the sports community, to support the sports industry as a knowledge partner in formulation of healthy food products; and to engage in entrepreneurial initiatives to solve individual and health problems of persons in the sports community	Problem Solving Innovation Entrepreneurial skills
PO5	Competently evaluate traditional as well as recent nutrition practices in relation to evidence-based nutrition and draw applicable conclusions, using a scientific and open mind with the vision of bettering food and nutrition practice in the Sports Industry.	Analytical and Scientific Reasoning
PO6	Competently explore the cause and effect relationships of food, nutrition and lifestyles on optimum body composition and to construct and follow through a research problem usingresearch techniques and statistical analysis, thus drawing up adequate conclusions for applications of research in the sportsindustry, community and clinical setups as employee or entrepreneur.	Research relatedskills
PO7	Successfully work in teams and cooperate and derive meaningful beneficial conclusions for health food requirements through interdisciplinary and collaborativeefforts in the community, research, industry and sports organizational set-ups	Cooperation/Team work

PO8	Envision a drive to translate research, recent innovations and personal and professional experiences into applications to benefit sports industry, management of their fitness nutrition and entrepreneurial ventures with self-awareness and introspection	Reflective Thinking
PO9	Use technology for sports foods, nutrition and consumer information, diet planning, nutrition education as well as be aware of using digitization for entrepreneurial ventures with special emphasis in the sports industry.	Information/digital literacy
PO10	Work independently, identify appropriate resources for aproject and manage a project to its fruitful and timely completion	Self-Directed Learning
PO11	Be adept with regard to use of national and global multi- cultural aspects of the foods and nutrition requirements of sports person depending upon the type of sport played, thus being able to deliver products and nutrition and lifestyle strategies for health of the individual and the sportscommunity.	Multi-cultural competence
PO12	Practice principles of holistic health, in the most sustainable and effective manner; placing consumer, community and fraternity well-being at the center of operations and refrain from unethical behavior at the workplace.	Moral and Ethical awareness and reasoning
PO13	Take on leadership positions formulating and sharing an inspiring vision and the eagerness to bring productive and sustainable positive results for our sports professionals and theentire sports fraternity using organizational, entrepreneurial and managerial skills	Leadership readiness/qualities
PO14	Continue lifelong learning and be updated with cutting edge knowledge and practices in the sports field and the understanding that ongoing learning has to be a personal and professional way of life; thus, being continuously involved inevolving, up scaling, reinventing and reskilling to the requirements of the times	Lifelong learning

4) Any other point (if any)

5) Credit Structure of the Program (Sem III & IV) (Table as per Parishishta 1 with sign of HOD and Dean)

R_____

Post Graduate Programs in University:

- **PG Diploma in Home Science – Sports Nutrition**
- **M.Sc. (Home Science – Sports Nutrition) (Two Years)**

Parishishta - 1

Exit option: PG Diploma (44 Credits) after Three Year UG Degree									
II	**6.5**	**Sem III**	**Course 1:** Advances in Human Nutrition Theory **Credits 4** **Course 2:** Nutrition for Power, Resistance and combat Sports Theory (2cr) Diet Planning for Power, Resistance and combat Sports Practical (2cr) **Credits 4** **Course 3:** Nutrition for Team Sports Theory (2 Cr) Diet Planning for Team Sports Practical (2 Cr) **Credits 4** **Course 4:** Ergonomics Theory (2 Cr) **Credits 2**	**Credits 4** **Course 1:** Women's Health, Wellness and Fitness Theory (2 Cr) Women's Health, Wellness and Fitness Practical (2 Cr) **OR** **Course 2:** Technological Applications in Sports Nutrition Theory (2 Cr) Technological Applications in Sports Nutrition Practical (2 Cr)			Research Project (4cr) **Credits 4**	22	---

		Sem IV	**Course 1:** Nutrition for Weight Management and Fitness Theory (2 Cr) Diet Planningfor Weight Management and Fitness Practical (2cr) **Credits 4** **Course 2:** Nutrition for Sports Personswith Special Conditions Theory (2 Cr) Diet Planning for Sports Persons with Special Conditions Practical (2 Cr) **Credits 4** **Course 3:** Entrepreneurshipand Management in the Sports Industry Theory (4 Cr) **Credits 4**	**Credits 4** **Course 1:** Food Psychologyand Nutrition Counseling Theory (2 Cr) Food Psychology and Nutrition Counseling Practical (2 Cr) **OR** **Course 2:** Novel and emerging strategies for health, wellness and fitness Theory (2 Cr) Novel and emerging strategies for health, wellness and fitness Practical (2 Cr)			Research Project (6 Cr) **Credits 6**	22	M.Sc. Degree
Cum. Cr. for 1 Yr PG Degree			**26**	**8**			**10**	**44**	
Cum. Cr. for 2 Yr PG Degree			**54**	**16**	**4**	**4**	**10**	**88**	

Note: * The number of courses can vary for totaling 14 Credits for Major Mandatory Courses in a semester as illustrated.

Sem. - III

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - III)

Course Code	Course Title	Th/Pr	Credits
SN03C1	Advances in Human Nutrition (Th)	**Theory**	**4**

Course Objectives:

To enable students to

1. Define and differentiate between macro and micronutrients, and explain their roles in human nutrition.
2. Apply knowledge of nutritional principles to analyze and evaluate dietary patterns and their impact on health outcomes
3. Design personalized nutrition plans based on individual needs and health goals.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcomes
CO1	Define key terms and concepts in human nutrition
CO2	Explain the role of macronutrients and micronutrients in human health
CO3	Evaluate nutrition-related research studies and their implications for public health.
CO4	Analyze the role of specific vitamins (fat-soluble and water-soluble) in health and disease.
CO5	Assess the effectiveness of nutrition interventions in improving health outcomes.
CO6	Create educational materials that promote healthy eating habits based on the latest nutrition science.

Unit No.	Course Content	No. of Hours
I.	**Concept of Nutrition** **A. Nutrition for growth & development** • General aspects of Growth: Cellular and Physical Growth, Critical Periods of growth and development • Epigenetic influence of nutrients on physical • Mental Growth and Development **B. Nutrient requirements** • RDA, AI, RDI, TUL, EAR • Methods of determining RDAs • National vs International dietary standards **C. Role of nutrition in health and disease** • Metabolic and lifestyle disorders (diabetes, cvd etc) • Nutrigenomics- understanding the interaction between genetics and diet. • Complementary Nutrition- Prebiotics, Probiotics and Synbiotics, Meal Replacers • **D. Inborn Errors of Metabolism-** Disorders of Carbohydrate Metabolism, Amino Acid Metabolism, Fatty Acid and Lipid Metabolism	**15**

II.	**A. Energy** • Units of energy, Energy intake vs Energy expenditure (EE) • Components of EE, Estimation of BMR & Total Energy expenditure • Calorimetry (Direct & Indirect) and Non calorimetric techniques. GEV & MEV; Atwater Factors-Advantages & Disadvantages • Energy imbalances-Excess & Deficiency –Acute and Chronic Physiological adaptations to Over and under nutrition **B. Carbohydrates** • Overview of Classification, Functions, digestion and absorption. • Carbohydrate recommendations • Glycemic Index and Glycemic Load-Applications in the diet • Dietary fiber and Resistant starch-Types, Health benefits ● Sugar substitutes-Nutritive and non -nutritive sweeteners- Synthetic and Natural sweeteners	**15**
III	**A. Fats and Fatty acids** • Overview of Classification, Functions, digestion and absorption; • RDAs of total dietary fat and fatty acid consumption; Fatty acid ratios • Role of total fat intake, SFA, MUFA & PUFAs in health & disease • Oil blends **B. Proteins and Amino acids** • Overview of Classification, Functions, digestion and absorption; • Essential Amino acid requirements and AA imbalances • Assessment of quality of Food protein-Biological and chemical methods, ● Assessment of protein nutritional status: Anthropometry, BIA -Tracer techniques, -Recommended Dietary Allowances of protein and amino acids for various groups of population -Concerns of RDAs for vulnerable groups of population	**15**
IV	**Micronutrients** A. **Vitamins**: Overview of Classification, digestion, absorption and transportation, functions, Requirements, deficiency & toxicity; • Assessment of nutritional status of Fat soluble –A,D,E & K & Water soluble vitamins (B-Complex vitamins and vitamin • Interrelationship between vitamins;& vitamins and macronutrients B. **Minerals** : Overview of Classification, digestion, absorption and transportation, functions, Requirements, deficiency & toxicity • Assessment of nutritional status of Macro minerals-Na, K, Ca, Phosphorus & Magnesium • Micro minerals-Iron, Iodine, Zinc and fluorine Trace Minerals- Copper and Selenium B: Mineral-Mineral interactions; • Interrelationship between vitamins & Minerals • Interrelationship between macro and micronutrients ● Ultratrace minerals	**15**
	Total Contact Hours	**60**

References:

Wildman, R. E. C. (2018). Advanced Human Nutrition. India: Jones & Bartlett Learning.

The Latest Research and Development of Minerals in Human Nutrition. (2021). Netherlands: Elsevier Science.

Shils, M.E., Olson, J., Shike, M. and Roos, C (2003). Modern Nutrition in Health and Disease, 9" edition Williams and Williams. A Beverly Co. London.

Bodwell, C.E..and Erdman, J.W. (2008) Nutrient Interactions. Marcel Dekker Inc. New York

Sareen, S, James, J (2005). Advanced Nutrition in Human Metabolism, 4th Edition, Thomson Wordsworth Publication, USA.

Chandra, R.K. (eds) (2002): Nutrition and Immunology, ARTS Biomedical. St. John's Newfoundland.

Grodd, J.L. and Gropper, S.S. (1999) Advanced Nutrition and human metabolism. Belmount CA Wodworth/ Thomson learning.
Judith E. Brown (1998) Nutrition Now, West/wadsworth International Thomson Pub. Co. Williams, Cand
Devlin, T.J. (1992) Foods nutrition and sports performance E and N Sposs I Ed.
Goodhart R.S.S and Shils, M.E (1998) Modern nutrition in health and disease. Philadelphia Lea and Febiger.
Shils, M.E., Olson, J., Shike, M. and Roos, C (2003). Modern Nutrition in Health and Disease, 9" edition Williams and Williams. A Beverly Co. London.
Stipanuk Martha H. 2006 Biochemical, physiological, molecular aspects of human nutrition – Saunders ELSEVIER.
Paul, I, Turner, E.R., Ross, Don – 2006 (2nd ed.) Discovering Nutrition – Jones and Bartlett Publishers – Canada.

Geissler, C., Powers, H (11th Ed.) (2005) Human Nutrition ELSEVIER Churchill Livinstone Zegler,

Evaluation:
4 credits (Total marks 100)

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Written and oral presentations on assigned topic / Literature review with class discussion/ Creating learning resources (videos or posters or brochures)	20
Class test/ Quiz/ Group Discussion	20
Class participation and evaluation	10
Total	**50**
SEMESTER-END EXAMINATION	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from Unit 3	10
Question 4 from Unit 4	10
Question 5 from multiple units	10
Total	**50**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - III)

Course Code	Course Title	Th/Pr	Credits
SN03C2A	Nutrition for Power, Resistance and Combat Sports	**Theory**	**2**

Course Objectives:

To enable students:

1. Identify key nutritional strategies for enhancing performance, recovery, and injury prevention in athletes participating in power, resistance, and combat sports.
2. Describe the role of hydration and electrolyte balance in optimizing athletic performance in power, resistance, and combat sports
3. Apply knowledge of sports nutrition principles to develop personalized nutrition plans for athletes based on their specific sport, training phase, and individual needs.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcomes
CO1	Recall the specific nutritional needs of athletes engaged in power and resistance sports
CO2	Explain the physiological demands of power and resistance sports on the body's energy systems.
CO3	Apply nutritional strategies to optimize energy availability for training and competition.
CO4	Analyze nutritional supplements commonly used in power and resistance sports, considering their efficacy and safety.
CO5	Assess the effectiveness of nutrition interventions in enhancing athletic performance and recovery.
CO6	Formulate strategies to manage dietary challenges and nutritional deficiencies specific to athletes in power and resistance sports.

Unit No.	Course Content	No. of Hours
I.	**A. Nutrition for Power sport athletes** • Types and characteristics of power sports (sprinting, throwing, body building etc) • Physiology of energy systems • Nutritional requirements- macronutrients- carbohydrates, fats proteins • Micronutrient requirements • Nutrient periodization in training and competition • Pre and post-competition nutrition for power sport athletes **B. Nutrition for Resistance sport athletes** • Overview of combat sports • Types and characteristics- physiological needs, body composition and energy systems used. • Macro and micronutrient requirements in training and competition. • Hydration guidelines in Resistance sport athletes • Impact of resistance training on body composition of athletes in strength sports • Nutrient periodization in training and competition • Pre and post competition nutrition for resistance sport athletes	**15**

II.	**A. Nutrition for combat sport athletes** • Overview of combat sports (archery, kickboxing, martial arts, Mallakhamb, etc.) • Characteristics- physiology, energy system, and body composition, duration of match, training. • Macro and micronutrient requirements in training and competition • Dietary and hydration strategies for athletes in different periods of training and Competition • Pre and post competition nutrition for combat sport athletes • Making weight- weight loss and gain in training and competition- **B. Use of Nutritional supplements in power, resistance and combat sports- use, effects, efficacy and safety** • Creatine monohydrate, Sodium bicarbonates, Nitrates • B-Alanine, Caffeine • Protein supplements • Fat burners	**15**
	Total Contact Hours	**30**

References:

NSCA's Guide to Sport and Exercise Nutrition. (2021). United States: Human Kinetics.

Wanlass, D. C. (2014). Strength Training and Sports Nutrition for Men. United Kingdom: Lulu.com.

Stone, M. H., Stone, M., Sands, W. A., Sands, B. (2007). Principles and Practice of Resistance Training. United Kingdom: Human Kinetics.

Manore, M., Meyer, N. L., & Thompson, J. (2009). Sport nutrition for health and performance. Human Kinetics.

Ranchordas, M. K., Rogerson, D., Ruddock, A., Killer, S. C., & Winter, E. M. (2013). Nutrition for tennis: practical recommendations. J Sports Sci Med, 12(2), 211-24.

Jeukendrup, A., & Gleeson, M. (2010). Sport nutrition: an introduction to energy production and performance (No. Ed. 2). Human Kinetics.

Seebohar, B. (2011). Nutrition periodization for athletes: Taking traditional sports nutrition to the next level. Bull Publishing Company.

Slater, G., & Phillips, S. M. (2011). Nutrition guidelines for strength sports: sprinting, weightlifting, throwing events, and bodybuilding. Journal of sports sciences, 29(sup1), S67-S77.

Helms, E. R., Aragon, A. A., & Fitschen, P. J. (2014). Evidence-based recommendations for natural bodybuilding contest preparation: nutrition and supplementation. Journal of the International Society of Sports Nutrition, 11(1), 20.

McArdle, W. D., Katch, F. I., & Katch, V. L. (2009). Sports and exercise nutrition. Lippincott Williams & Wilkins.

Evaluation:

2 credits (Total marks 50)

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Preparation of Powerpoint presentations on topics assigned	10
Quiz/ Debate/ Class discussion/ Class test	10
Class participation and evaluation	5
Total	**25**

SEMESTER-END EXAMINATION	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from multiple units	5
Total	**25**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - III)

Course Code	Course Title	Th/Pr	Credits
SN03C2BP	Diet Planning for Power, Resistance and Combat Sports	**Practical**	**2**

Course Objectives:

1. To enable students:
   1. Identify key nutritional strategies for enhancing performance, recovery, and injury prevention in athletes participating in power, resistance, and combat sports.
   2. Describe the role of hydration and electrolyte balance in optimizing athletic performance in power, resistance, and combat sports
   3. Apply knowledge of sports nutrition principles to develop personalized nutrition plans for athletes based on their specific sport, training phase, and individual needs.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcomes
CO1	Recall the specific nutritional needs of athletes engaged in power and resistance sports
CO2	Explain the physiological demands of power and resistance sports on the body's energy systems.
CO3	Apply nutritional strategies to optimize energy availability for training and competition.
CO4	Analyze nutritional supplements commonly used in power and resistance sports, considering their efficacy and safety.
CO5	Assess the effectiveness of nutrition interventions in enhancing athletic performance and recovery.
CO6	Formulate strategies to manage dietary challenges and nutritional deficiencies specific to athletes in power and resistance sports.

Unit No.	Course Content	No. of Hours
I.	**A. Planning and preparation of diets and supplements for power sport athletes** • Sprinting • Throwing • High jump and long jump • Gymnastics **B. Planning and preparation of diets and supplements for resistance class sports** • Weightlifting - Body building	**30**
II.	**A. Planning and preparation of diets and supplements for combat sport athletes** • Archery • Kick boxing • Martial arts • Mallakhamb B. **Case study analysis for power, resistance and combat sport athletes**	**30**
	Total Contact Hours	**60**

References:

Slater, G., & Phillips, S. M. (2011). Nutrition guidelines for strength sports: sprinting, weightlifting, throwing events, and bodybuilding. Journal of sports sciences, 29(sup1), S67-S77.

Helms, E. R., Aragon, A. A., & Fitschen, P. J. (2014). Evidence-based recommendations for natural bodybuilding contest preparation: nutrition and supplementation. Journal of the International Society of Sports Nutrition, 11(1), 20.

Maughan, R. J., & Burke, L. M. (2012). Practical nutritional recommendations for the athlete. In Sports Nutrition: More Than Just Calories-Triggers for Adaptation (Vol. 69, pp. 131-150). Karger Publishers

McArdle, W. D., Katch, F. I., & Katch, V. L. (2009). Sports and exercise nutrition. Lippincott Williams & Wilkins.

Jeukendrup, A., & Gleeson, M. (2010). Sport nutrition: an introduction to energy production and performance (No. Ed. 2). Human Kinetics.

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Journal	5
Continuous Evaluation: Assessment of case studies	15
Class participation and evaluation	5
Total	**25**

Evaluation: 2 credits (Total marks 50)

SEMESTER END EXAM	**Marks**
All questions are compulsory with internal choice.	
Question 1 from unit 1	10
Question 2 from unit 2	10
Question 3: Viva-voce examination	5
Total	**25**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - III)

Course Code	Course Title	Th/Pr	Credits
SN03C3A	Nutrition for Team Sports	**Theory**	**2**

Course Objectives:

To enable students to:

1. Explain the physiological demands of team sports and how nutrition influences these demands.
2. Compare and contrast different nutritional strategies and supplements commonly used in team sports, evaluating their efficacy and safety.
3. Create innovative strategies and interventions to address nutrition-related performance barriers and challenges specific to team sports.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcomes
CO1	Define key macronutrients (carbohydrates, proteins, fats) and micronutrients relevant to performance in team sports.
CO2	Explain the role of nutrition in optimizing energy levels and endurance during team sport activities.
CO3	Implement hydration strategies to maintain optimal fluid balance during practices and matches.
CO4	Evaluate the effectiveness of dietary supplements commonly used by athletes in team sports.
CO5	Critically analyze emerging research findings and controversies in team sports nutrition.
CO6	Develop evidence-based nutrition protocols for pre-game, during-game, and post-game nutrition in team sports.

Unit No.	Course Content	No. of Hours
I.	**A. Classification and physiology of field and court sports** • Introduction to team sports • Type and characteristics of team sports- field and court sports • Physique, physiology, body composition, and energy metabolism in team sports. **B. Nutritional needs of Field and Batting sport athletes according to training and position on the field.** • **Macronutrien**t requirement: o Carbohydrate intake o Proteins and amino acids- type, amount, and timing of ingestion o Fat requirements. • **Micronutrient and hydration requirements** o Role of vitamins and minerals in energy metabolism, blood formation, bone health, and antioxidants. o Fluid and electrolyte requirements strategies in athletes based on the rules of the sports available time, and opportunities to hydrate on the field. • Nutrition for pre-, during, and post-event/training	**15**

II.	**A. Nutritional needs of Court and Indian team sport athletes according to training and position on the field.** • **Macronutrien**t requirement: o Carbohydrate intake o Proteins and amino acids- type, amount, and timing of ingestion o Fat requirements. • **Micronutrient and hydration requirements** o Role of vitamins and minerals in energy metabolism, blood formation, bone health, and antioxidants. o Fluid and electrolyte requirements strategies in athletes based on the rules of the sports available time, and opportunities to hydrate on the field. o Nutrition for pre-, during, and post-event/training **B. Use of Nutritional supplements in team sports** • Creatine Monohydrate • Beta-Alanine • Vitamins and Minerals: Iron, Vit D, B, E, C, Magnesium, and Zinc • Nitrates • Protein supplements • Caffeine • Sports bars, drinks(ELECTROLYTES) and gels	**15**
	Total Contact Hours	**30**

References:

Food, Nutrition and Sports Performance III. (2013). United Kingdom: Taylor & Francis.

Kealy, L. (2023). Eat to Win: Nutrition for Peak Performance in Female Team Sport Athletes. Germany: Meyer & Meyer Sport, Limited.

Gleeson, M. (2022). Nutrition for Top Performance in Soccer: Eat Like the Pros and Take Your Game to the Next Level. Germany: Meyer & Meyer Sport.

Rankin J W, Nutrition for very high intensity sports in Sports Nutrition: A Practice manual for professionals edited by Marie Dunford 2006

Maughan, R. J., & Burke, L. M. (2012). Practical nutritional recommendations for the athlete. In Sports Nutrition: More Than Just Calories-Triggers for Adaptation (Vol. 69, pp. 131-150). Karger Publishers

Gibala, M. J. (2013). Nutritional strategies to support adaptation to high-intensity interval training in team sports. In Nutritional Coaching Strategy to Modulate Training Efficiency (Vol. 75, pp. 41-49). Karger Publishers.

Evaluation:
2 credits (Total marks 50)

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Written and oral presentations on assigned topic / Literature review with class discussion	10
Class test/ debate/Quiz	10
Class participation and evaluation	5
Total	**25**
SEMESTER-END EXAMINATION	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from multiple units	5
Total	**25**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - III)

Course Code	Course Title	Th/Pr	Credits
SN03C3BP	Diet Planning for Team Sports	**Practical**	**2**

Course Objectives:

To enable students to:

1. Explain the physiological demands of team sports and how nutrition influences these demands.
2. Compare and contrast different nutritional strategies and supplements commonly used in team sports, evaluating their efficacy and safety.
3. Create innovative strategies and interventions to address nutrition-related performance barriers and challenges specific to team sports

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcomes
CO1	Define key macronutrients (carbohydrates, proteins, fats) and micronutrients relevant to performance in team sports.
CO2	Explain the role of nutrition in optimizing energy levels and endurance during team sport activities.
CO3	Implement hydration strategies to maintain optimal fluid balance during practices and matches.
CO4	Evaluate the effectiveness of dietary supplements commonly used by athletes in team sports.
CO5	Critically analyze emerging research findings and controversies in team sports nutrition.
CO6	Develop evidence-based nutrition protocols for pre-game, during-game, and post-game nutrition in team sports.

Unit No.	Course Content	No. of Hours
I.	Planning and preparation of diets and supplements for team sports • Field sports- hockey, football, rugby • Court sports- volleyball, basketball, netball.	**30**
II.	Planning and preparation of diets and supplements for team sports • Batting sports- cricket, baseball, softball • Indian team sports- kabaddi, kho-kho	**30**
	Total Contact Hours	**60**

References:

Food, Nutrition and Sports Performance III. (2013). United Kingdom: Taylor & Francis.

Kealy, L. (2023). Eat to Win: Nutrition for Peak Performance in Female Team Sport Athletes. Germany: Meyer & Meyer Sport, Limited.

Gleeson, M. (2022). Nutrition for Top Performance in Soccer: Eat Like the Pros and Take Your Game to the Next Level. Germany: Meyer & Meyer Sport.

Rankin J W, Nutrition for very high intensity sports in Sports Nutrition: A Practice manual for professionals edited by Marie Dunford 2006

Maughan, R. J., & Burke, L. M. (2012). Practical nutritional recommendations for the athlete. In Sports Nutrition: More Than Just Calories-Triggers for Adaptation (Vol. 69, pp. 131-150). Karger Publishers

Gibala, M. J. (2013). Nutritional strategies to support adaptation to high-intensity interval training in team sports. In Nutritional Coaching Strategy to Modulate Training Efficiency (Vol. 75, pp. 41-49). Karger Publishers.

Evaluation:
2 credits (Total marks 50)

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Journal	5
Continuous Evaluation: Assessment of case studies	15
Class participation and evaluation	5
Total	**25**
SEMESTER-END EXAMINATION	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3: Viva-voce examination	5
Total	**25**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - III)

Course Code	Course Title	Th/Pr	Credits
SN03C4	Ergonomics	**Theory**	**2**

Course Objectives:

To enable students to understand.

1. Identify ergonomic principles, guidelines, and standards that promote safety, efficiency, and comfort.
2. Assess the effectiveness of ergonomic interventions in improving worker health, productivity, and job satisfaction.
3. Create ergonomic training programs and resources for employees and employers to promote safe work practices and injury prevention.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcomes
CO1	Recall the principles and concepts of ergonomics.
CO2	Explain how ergonomic principles can enhance safety, efficiency, and comfort in workplaces.
CO3	Apply ergonomic assessment tools to identify and mitigate ergonomic hazards in specific workplaces or tasks.
CO4	Evaluate the effectiveness of ergonomic interventions in reducing injury rates and improving productivity.
CO5	Evaluate the ethical considerations of ergonomics in relation to worker rights and well-being.
CO6	Create ergonomic training programs for employees to foster awareness and proper ergonomic practices.

Unit No.	Course Content	No. of Hours
I.	**A. Ergonomics** • Definition and applications in sports **B. Competitive and Training Stress in Sport** • Physiological Loading • Spinal Loading • Physical Loading • Psychological Loading **C. Measurement in sports & exercise** • Metabolic testing & power testing • Optimizing training and performance goals **D. Environmental Influence on sports performance** • Sports Equipment and Playing Surfaces, • Sports Clothing, Footwear and orthotics • Field conditions for team games	**15**
II.	**A. Circadian Rhythms** • Training and Time of Day, Sleep–Wake Cycle • Travel Fatigue and Jet Lag	**15**

	• Sleep Deprivation or Disruption • Nocturnal Shift Work • Strategies to manage normal circadian rhythms in international athletes **B. Ergonomic considerations for corporate and special populations** • Occupational ergonomics for corporate offices, schools and colleges • Pediatric and adolescent sports persons • Disabled and ageing athletes **C. Sports injuries** • Types, Evaluation & rehabilitation • Core strengthening, • Prolotherapy • Postoperative athletes • Protective devices for sports persons-head gear & knee bracing • Participatory Ergonomics- Human Enhancement Technologies • Performance and Cognitive Enhancement • h) Mechanical & psychological ergogenic aids	
	Total Contact Hours	**30**

References:

Singh, L. P. (2018). Work Study and Ergonomics. India: Cambridge University Press.

Human Factors and Ergonomics in Sport: Applications and Future Directions. (2020). United States: CRC Press.

Sport, Leisure and Ergonomics. (2013). United Kingdom: Taylor & Francis.

Youlian Hong(2014) Routledge Handbook of Ergonomics in Sport and Exercise, London & New York

Thomas Reilly (2010) Ergonomics in Sport and Physical Activity, Enhancing Performance and Improving Safety

Francs G. O'Connor et al (2013) ACSM'S Sports Medicine-A comprehensive review, Wolter's Kluwer, Lippincott, Williams & Wilkins

Evaluation:
2 credits (Total marks 50)

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Written and oral presentations on assigned topic / Literature review with class discussion	10
Class test/ debate/Quiz	10
Class participation and evaluation	5
Total	**25**
SEMESTER-END EXAMINATION	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from multiple units	5
Total	**25**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - III)

Course Code	Course Title	Th/Pr	Credits
SN03C5E1A	Women's Health, Wellness and Fitness	**Theory**	**2**

Course Objectives:

To enable students to understand:

1. Identify common health concerns and conditions affecting women across the lifespan, including hormonal, reproductive health and health across lifespan
2. Explain the impact of lifestyle factors such as nutrition, physical activity, stress management, and sleep on women's health outcomes
3. Apply knowledge of women's health principles to develop personalized wellness plans for women based on different life stages and health needs.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcomes
CO1	Define the hormonal changes that takes place in a woman throughout the lifespan
CO2	Discuss the rationale behind preventive care measures and their significance in women's health maintenance.
CO3	Formulate strategies for managing menopausal symptoms and promoting health during this life stage
CO4	Analyze the physical and emotional challenges faced by adolescents during puberty.
CO5	Evaluate the effectiveness of prenatal care programs in improving maternal and infant health outcomes.
CO6	Formulate a holistic preventive care plan integrating regular check-ups, vaccinations, and screenings for breast and cervical cancers.

Unit	Course Content	Periods
Unit I	**A. Women's Health Across the Lifespan** o Puberty and Adolescence: Physical and emotional changes, sexual health education o Pregnancy and Childbirth: Prenatal care, labour, delivery, and postpartum recovery o Menopause and Aging: Hormonal changes, managing symptoms, and maintaining health **B. Reproductive health** o Introduction to Women's reproductive health: Key issues and disparities o Menstrual cycle, contraception options, and reproductive anatomy o Hormonal Health: Understanding hormone fluctuations and their impact on health o Nutritional requirement C. **Healthy Eating Habits:** Meal planning, mindful eating, and maintaining a balanced diet ● **Preventive Care and Screenings**: Regular check-ups, vaccinations, and screenings for breast and cervical cancers	15
Unit II	**A. Physical Fitness and Exercise** o Importance of Physical Activity: Benefits for cardiovascular health, metabolic syndrome, hormones, bone density, and mental well-being o Different ways to incorporate physical activity in daily life- Home based exercises, Zumba, Dance o Mental Health and Well-being: Stress management, mindfulness, Positive body image, and emotional health **B. Specific Health conditions in women** o Thyroid o High Cortisol o PCOD/PCOS o Iron deficiency o Postpartum depression **C. Skin and hair health** o Introduction- Overview of the integumentary system (skin and hair), Importance of healthy skin and hair, Factors influencing skin and hair health (e.g., genetics, environment, lifestyle). o Essential Nutrients for Skin and Hair o Impact of Diet on Skin and Hair **B.** Common Skin and Hair Conditions	15
	Total hours	30

References:

The Active Female: Health Issues Throughout the Lifespan. (2014). United States: Springer New York.

Kettles, M., Cole, C. L., Wright, B. S. (2006). Women's Health and Fitness Guide. United Kingdom: Human Kinetics.

Condon, M. C. (2004). Women's Health: Body, Mind, Spirit : an Integrated Approach to Wellness and Illness. United Kingdom: Prentice Hall.

Exercise, Nutrition and the Older Woman: Wellness for Women Over Fifty. (2000). United States: CRC Press.

Woman's Hormone Handbook: Unlock the Secrets of Female Hormonal Health for Lifelong Balance and Vitality. (2024). (n.p.): Teilingen Press.

Priyanka, R. (2022). Women's Mental Health and Wellbeing A Psychosocial Study. (n.p.): Hrithik.

Evaluation:

2 credits Total marks 50

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Written and oral presentations on assigned topic / Literature review with class discussion	10
Class test/ debate/Quiz	10
Class participation and evaluation	5
Total	25

SEMESTER-END EXAMINATION	**Marks**
All questions are compulsory. Up to 50% choice to be given within each question.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from multiple units	5
Total	25

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - III)

Course Code	Course Title	Th/Pr	Credits
SN03C5E1BP	Women's Health, Wellness and Fitness	**Practical**	**2**

Course Objectives:

To enable students to understand:

1. Identify common health concerns and conditions affecting women across the lifespan, including hormonal, reproductive health and health across lifespan
2. Explain the impact of lifestyle factors such as nutrition, physical activity, stress management, and sleep on women's health outcomes
3. Apply knowledge of women's health principles to develop personalized wellness plans for women based on different life stages and health needs.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

Course Outcome No.	Course Outcomes
CO1	Define the hormonal changes that takes place in a woman throughout the lifespan
CO2	Discuss the rationale behind preventive care measures and their significance in women's health maintenance.
CO3	Formulate strategies for managing menopausal symptoms and promoting health during this life stage
CO4	Analyze the physical and emotional challenges faced by adolescents during puberty.
CO5	Evaluate the effectiveness of prenatal care programs in improving maternal and infant health outcomes.
CO6	Formulate a holistic preventive care plan integrating regular check-ups, vaccinations, and screenings for breast and cervical cancers.

Unit	Course Content	Periods
Unit I	**Nutrition and Meal Planning** • Nutritional Needs for Women: Caloric intake, macronutrient balance, micronutrient considerations and supplement requirement in special health conditions- o PCOD/PCOS o Thyroid o Increased cortisol o Iron deficiency o Hormonal imbalance o Menopause •	30
Unit II	Comprehensive health and fitness for women • Healthy Eating on a Budget: Meal planning, grocery shopping tips, and recipe modification • Cooking Demonstrations to improve the nutritional content of food: Hands-on sessions preparing nutritious meals and snacks • Fitness Fundamentals for Women- Flexibility and Mobility: Stretching exercises, yoga, dance, zumba and Pilates for improved flexibility, Home exercises and fitness techniques	30
	Total Hours	60

References:

The Active Female: Health Issues Throughout the Lifespan. (2014). United States: Springer New York.

Kettles, M., Cole, C. L., Wright, B. S. (2006). Women's Health and Fitness Guide. United Kingdom: Human Kinetics.

Condon, M. C. (2004). Women's Health: Body, Mind, Spirit : an Integrated Approach to Wellness and Illness. United Kingdom: Prentice Hall.

Exercise, Nutrition and the Older Woman: Wellness for Women Over Fifty. (2000). United States: CRC Press.

Woman's Hormone Handbook: Unlock the Secrets of Female Hormonal Health for Lifelong Balance and Vitality. (2024). (n.p.): Teilingen Press.

Priyanka, R. (2022). Women's Mental Health and Wellbeing A Psychosocial Study. (n.p.): Hrithik.

Evaluation:

2 credits Total marks 50

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Journal	5
Continuous Evaluation: Meal Planning	15
Class participation and evaluation	5
Total	**25**

SEMESTER-END EXAMINATION	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3: Viva- voce examination	5
Total	**25**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - III)

Course Code	Course Title	Th/Pr	Credits
SN01C5E2A	Technological Applications in the Sports	**Theory**	**2**

Course Objectives-

To enable students to understand:

1. Describe the integration of technology in sports nutrition research, practice, and education.
2. Describe how technological advancements contribute to personalized nutrition strategies and athlete monitoring in sports nutrition.
3. Create educational resources and training materials for athletes and coaches in sports nutrition, with the use of technology

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

Course Outcome No.	Course Outcomes
CO1	Identify different types of sensors, tracking devices, and wearables utilized in sports technology.
CO2	Explain how technological advancements have influenced training methodologies and athlete development in sports.
CO3	Utilize sports analytics software and tools to interpret data and make informed decisions in coaching and training.
CO4	Analyze case studies of technological applications in sports to evaluate their effectiveness in improving performance and preventing injuries.
CO5	Assess the ethical considerations of using technology in sports, including issues of data privacy, fairness, and the potential for misuse.
CO6	Create proposals for integrating emerging technologies (e.g., virtual reality, artificial intelligence) into sports training and competition.

Unit No.	Course Content	No. of Hours
I.	**A. Introduction to sports technology** • Historical perspective: Evolution of technology in sports • The current landscape of sports technology • Types **B. Use of technology for Sports performance analysis :** • Introduction to sports analytics • Use of data in player performance analysis, • Overview of wearable devices in sports in monitoring athlete performance and health- Wearables, tracking devices, sensors technology • AI applications in sports coaching and strategy • Technological advancements in sports equipment design and its effect on athlete performance and safety • Exploration of cutting-edge technologies (e.g., biometrics, 5G, blockchain) • Sustainability, future outlook, and predictions •	**15**

II.	**A. eSports and Virtual Sports** • Introduction to eSports and virtual sports • Technological innovations in eSports tournaments • Comparisons with traditional sports industry • Nutritional and fitness consideration for such players B. Artificial Intelligence based optimization for sports nutritionist • Improve athlete performance • Reduce the risk of injury and faster recovery • Develop new products and services • Nutrient Timing Optimization • Virtual Assistants, Teleconsultation and Chatbots	**15**
	Total Contact Hours	**30**

References:

21st Century Sports: How Technologies Will Change Sports in the Digital Age. (2020). Germany: Springer International Publishing.

Memmert, D. (2024). Sports Technology: Technologies, Fields of Application, Sports Equipment and Materials for Sport. Germany: Springer Berlin Heidelberg, Imprint: Springer Spektrum.

The Impact of Technology on Sport II. (2007). Netherlands: Taylor & Francis.

The Use of Technology in Sport: Emerging Challenges. (2018). United Kingdom: IntechOpen.

Interactive Sports Technologies: Performance, Participation, Safety. (2022). United Kingdom: Taylor & Francis.

The Use of Applied Technology in Team Sport. (2021). United Kingdom: Taylor & Francis.

Rogers, Ryan. (2019). Understanding Esports: An Introduction to the Global Phenomenon. United States: Lexington Books.

Collis, W. (2020). The Book of Esports. United States: RosettaBooks.

Evaluation:
2 credits (Total marks 50)

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Written and oral presentations on assigned topic / Literature review with class discussion/ class test	10
Swayam/ MOOC/ any online certification course conducted by qualified practitioner with submission of completion certificate	10
Class participation and evaluation	5
Total	**25**

SEMESTER-END EXAMINATION	**Marks**
All questions are compulsory. Up to 50% choice to be given within each question.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from multiple units	5
Total	**25**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - III)

Course Code	Course Title	Th/Pr	Credits
SN01C5E2BP	Technological Applications in the Sports	**Practical**	**2**

Course Objectives-

To enable students to understand:

1. Describe the integration of technology in sports nutrition research, practice, and education.
2. Describe how technological advancements contribute to personalized nutrition strategies and athlete monitoring in sports nutrition.
3. Create educational resources and training materials for athletes and coaches in sports nutrition, with the use of technology

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

Course Outcome No.	Course Outcomes
CO1	Identify different types of sensors, tracking devices, and wearables utilized in sports technology.
CO2	Explain how technological advancements have influenced training methodologies and athlete development in sports.
CO3	Utilize sports analytics software and tools to interpret data and make informed decisions in coaching and training.
CO4	Analyze case studies of technological applications in sports to evaluate their effectiveness in improving performance and preventing injuries.
CO5	Assess the ethical considerations of using technology in sports, including issues of data privacy, fairness, and the potential for misuse.
CO6	Create proposals for integrating emerging technologies (e.g., virtual reality, artificial intelligence) into sports training and competition.

Unit No.	Course Content	No. of Hours
I.	• Case studies on Technological Applications in Sports • Use of Tableau, Microsoft BI • Excel: Formula and function, Vlookup, Pivot Tables and Charts • Presentation on self-use of any: Sports Performance monitor, CGM, Smartwatches, etc with their respective interpretations.	**30**
II.	Guest lectures from industry professionals Visits to sports industries having high-end technologies	**30**
	Total Contact Hours	**60**

References:

21st Century Sports: How Technologies Will Change Sports in the Digital Age. (2020). Germany: Springer International Publishing.

Memmert, D. (2024). Sports Technology: Technologies, Fields of Application, Sports Equipment and Materials for Sport. Germany: Springer Berlin Heidelberg, Imprint: Springer Spektrum.

The Impact of Technology on Sport II. (2007). Netherlands: Taylor & Francis.

The Use of Technology in Sport: Emerging Challenges. (2018). United Kingdom: IntechOpen.

Interactive Sports Technologies: Performance, Participation, Safety. (2022). United Kingdom: Taylor & Francis.

The Use of Applied Technology in Team Sport. (2021). United Kingdom: Taylor & Francis.

Rogers, Ryan. (2019). Understanding Esports: An Introduction to the Global Phenomenon. United States: Lexington Books.

Collis, W. (2020). The Book of Esports. United States: RosettaBooks.

Evaluation:
2 credits (Total marks 50)

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Journal	5
Continuous Evaluation: Assessment of case studies	15
Class participation and evaluation	5
Journal	25

SEMESTER-END EXAMINATION	**Marks**
All questions are compulsory. Up to 50% choice to be given within each question.	
Question 1: Unit 1	10
Question 2: Unit 2	10
Question 3 Viva	5
Total	25

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - III)

Course Code	Title	Th/Pr	Credits	Hours
SN03C6	**Research Project**	Research	4	120

COURSE OBJECTIVES:

1. To provide students with an opportunity to conduct independent research under supervision in Sports Nutrition and allied areas.
2. To encourage students to work in conjunction with relevant food industries, institutes, Governmental and non-governmental agencies, gyms, wellness and fitness centres, clinics, schools, sports and fitness ventures, entrepreneurs, communities and other relevant agencies.
3. To assist students in developing general research skills as well as research skills specific to their specialization.
4. To encourage students to adopt best practices in research.
5. To facilitate students in accomplishing the beginning steps of the research process, formulate and defend a research proposal, begin data collection, and write the first four chapters of the dissertation (Introduction, Review of Literature; Aims and objectives and Method).

Course Outcomes (CO):
On successful completion of the course, the student will be able to:

CO No.	Course Outcome
CO1	Demonstrate the ability to design and conduct independent research projects in the field of Sports Nutrition and related disciplines, under the guidance of faculty mentors.
CO2	Establish effective partnerships and collaborations with relevant industries, sports and fitness ventures, institutes, schools, and other stakeholders to enrich research endeavors and enhance practical applications of research findings.
CO3	Develop and apply advanced research methodologies, techniques, and tools specific to their area of specialization, while also honing general research skills such as critical thinking, problem-solving, and data analysis.
CO4	Adhere to ethical standards and best practices in research, including the responsible conduct of research, proper citation and referencing, and maintaining integrity in data collection, analysis, and reporting.
CO5	Successfully complete key milestones in the research process, including formulating and defending a well-structured research proposal, initiating data collection procedures, and drafting the initial chapters of the dissertation (Introduction and Review of Literature; Methodology) with clarity, coherence, and scholarly rigor.

Course Content

Unit No.	Course Content	No. of Hours
I.	**Understanding tools for review of literature** • Metanalysis and Literature review- differences • PubMed, Cochrane Databases, Research Gate, Google Scholar • RefWorks, Citethisforme, • Understanding various referencing styles AMA, Vancouver, APA (6th Ed) • Plagiarism Check Software's **Review of Literature** • Explore and finalize the area of interest for research with guidance from experts for feasibility, relevance and significance. • Refer national and international journals and other relevant literature like dissertations, thesis, books. • Contacting and communicating with experts (locally, nationally, and internationally) initially and periodically throughout the research process • Identifying possible focus areas with regard to one topic; specifying one such focus area (using relevant reading and communication with experts); writing research objectives/ questions/ hypotheses; conducting a thorough literature review; presenting a clear and convincing argument in support of the study; writing the first chapter of the dissertation, namely, the *Introduction and Review of Literature*, with due acknowledgement of source of ideas.	**60**
II.	**Proposed Methodology** • Specifying variables; defining variables (citing relevant literature) • Selecting an appropriate research design Writing the second chapter of the dissertation, namely, the *Method*, with due acknowledgement of source of ideas; orally defending a research proposal; integrating feedback. **Beginning Data Collection** • Obtaining consent from participants and relevant agencies/authorities; • At least starting data collection; • Integrating changes if any; • Scheduling remaining data collection; • Starting data entry; • Revising the first two chapters of the dissertation	**60**

References:

Dissertations in the College Library
Relevant Research Literature as per selected topic from scientific journals, dissertations, theses, books, literature on the internet.

Evaluation (Total Marks 100):

Continuous Internal Evaluation	Marks
Research Guide's Evaluation for Examining the Student's expertise with regard to Research: Proactive / Initiative / Responsibility / Flexibility/ Receptivity to feedback/ Thoroughness/ Meeting deadlines / Regularity in meeting/ Ethics / Absence of Plagiarism/ Networking, collaboration/ contacting experts.	25
Research Guide's Evaluation for Examining the Quality of Chapters 1 and 2 of the M.Sc. Dissertation: Chapter 1: Literature Review; Research Purpose (Objectives/Hypotheses/Questions); Chapter 2: Tools/Measurement	25
Total	**50**

Semester-end Examination	Marks
External Examiner's Evaluation of the Submitted Document: Relevance of research topic; Accuracy/Thoroughness of Literature Review; Clarity & Appropriateness of the Research Purpose; Accuracy & quality of methodology-related decisions; Quality & appropriateness (including ethics) of measurement/tools	25
External Examiner's Evaluation through Viva Voce, of Student's expertise with regard to Research: Clarity/Soundness/Accuracy with regard to selection of topic; Ability to clarify and contextualize Non-Indian vs Indian Literature; Clarity/Soundness/Accuracy with regard to the review of literature , research design & sampling, measurement/tools & plan of analysis, the beginning steps of the research process; student's emerging research expertise	25
Total	**50**

Sem. - IV

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - IV)

Course Code	Course Title	Th/Pr	Credits
SN04C1A	Nutrition for Weight Management and Fitness	**Theory**	**2**

Course Objectives:

To enable students to

1. Describe the physiological and psychological aspects of nutrition in relation to fitness and weight management.
2. Describe the impact of dietary choices, nutrient timing, and hydration on body composition and fitness goals.
3. Apply knowledge of nutrition principles to develop personalized dietary plans for weight management and fitness goals, considering individual needs, preferences, and health conditions.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcomes
CO1	Recall the basic principles of nutrition related to weight management and fitness
CO2	Explain the relationship between calorie intake, energy expenditure, and weight management
CO3	Implement strategies to modify dietary habits for long-term weight management and fitness
CO4	Evaluate the nutritional content of typical meals and suggest improvements for better health outcomes.
CO5	Assess the effectiveness of nutrition interventions in achieving sustainable weight management and fitness goals.
CO6	Develop a comprehensive dietary strategy integrating nutrition, exercise, and lifestyle factors for optimizing fitness goals

Unit No.	Course Content	No. of Hours

I.	Fundamentals of weight management: Calorie intake, expenditure, etc.
	
	Overweight/ Obesity management in general population
	
	• Definition and classifications (BMI, waist circumference).
	• Causes of Overweight
	• Childhood obesity, adult obesity
	• Associated health risks (diabetes, heart disease, etc.).
	• Impact on mental health and quality of life.
	• Assessment Tools: How to measure and track overweight., Understanding body composition
	• Strategies for Overweight Management and weight maintenance:
	  o Nutritional Strategies:
	  o Physical Activity and Exercise
	  o Medical and Surgical Interventions- Bariatric surgery, liposuction, Cryogenic freezing
	  o Behavior modification techniques for sustainable lifestyle changes.
	  o Strategies to maintain muscle mass during weight loss
	  o Healthy Eating Habits
	  o Nutritional Supplements for weight loss
	Diverse diet modalities in weight management- Keto diet, intermittent fasting, etc
		15

II.	Underweight management in general population
	
	• Introduction to Underweight
	• Causes of Underweight-Impact of inadequate nutrition, illness, and metabolism, Eating Disorders
	• Health Implications of Underweight- Associated health risks (weakened immune system, osteoporosis, etc.)
	• Effects on mental health and quality of life.
	• Assessment and Diagnosis: Understanding nutritional deficiencies and metabolic markers.
	• Strategies for Healthy Weight Gain
	  o Nutritional Strategies: Caloric surplus, macronutrient distribution, and micronutrient adequacy
	  o Physical Activity and Exercise
	  o Strategies for sustaining gain muscles and preventing relapse
	• Nutritional Supplements for weight gain
		15

	Total Contact Hours	**30**

References

Turck, M. (2001). Healthy Eating for Weight Management (Nutrition and Fitness for Teens). United States: Life Matters.

Favor, L. J. (2008). Weighing in: Nutrition and Weight Management. United States: Marshall Cavendish Benchmark.

Mason, Charlie (2021). Fitness Nutrition (fitness nutrition weight muscle food guide your loss health fitness books). (n.p.): Tilcan Group Limited.

Storlie, Jean & Jordan, Henry A. (2013). Nutrition and Exercise in Obesity Management. Netherlands: Springer Netherlands.

Rankin, H. (2004). The TOPS Way to Weight Loss: Beyond Calories and Exercise. United States: Hay House.

Bailor, J. (2012). The Smarter Science of Slim: What the Actual Experts Have Proven about Weight Loss, Health, and Fitness. United States: SANE Solution.

Wohlrabe M. D., H., Riverón, I. (2016). Healthy and Lean: The Science of Metabolism and the Psychology of Weight Management. United States: Lulu Publishing Services.

Chatterjee, A. (2018). The Science Behind the Fad: Understanding Weight Loss. (n.p.): Amazon Digital Services LLC - KDP Print US.

Evaluation:

2 credits (Total marks 50)

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Preparation of Powerpoint presentations on topics assigned / Literature review with class discussion	10
Quiz/ Debate/ Class discussion/ Class test	10
Class participation and evaluation	5
Total	**25**

SEMESTER-END EXAMINATION	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from multiple units	5
Total	**25**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - IV)

Course Code	Course Title	Th/Pr	Credits
SN04C1BP	Diet Planning for Weight Management and Fitness	Practical	2

Course Objectives:
To enable students to

1. Describe the physiological and psychological aspects of nutrition in relation to fitness and weight management.
2. Describe the impact of dietary choices, nutrient timing, and hydration on body composition and fitness goals.
3. Apply knowledge of nutrition principles to develop personalized dietary plans for weight management and fitness goals, considering individual needs, preferences, and health conditions.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcomes
CO1	Recall the basic principles of nutrition related to weight management and fitness
CO2	Explain the relationship between calorie intake, energy expenditure, and weight management
CO3	Implement strategies to modify dietary habits for long-term weight management and fitness
CO4	Evaluate the nutritional content of typical meals and suggest improvements for better health outcomes.
CO5	Assess the effectiveness of nutrition interventions in achieving sustainable weight management and fitness goals.
CO6	Develop a comprehensive dietary strategy integrating nutrition, exercise, and lifestyle factors for optimizing fitness goals

Unit No.	Course Content	No. of Hours
I.	**A. Planning of Diets for overweight and obese individuals of different age group** • Planning diets using Medical Nutrition Therapy with allocation of macronutrients and micronutrients • Menu Planning • Detailed calculation to understand the efficacy of the plan • Supplement usage - Outline recommendations in easily understood format.	**30**
II.	**A. Planning of Diets for overweight and obese individuals of different age group** • Planning diets using Medical Nutrition Therapy with allocation of macronutrients and micronutrients • Menu Planning • Detailed calculation to understand the efficacy of the plan • Supplement usage • Outline recommendations in easily understood format specially for micronutrient deficiencies	**30**
	Total Contact Hours	**60**

References:

Turck, M. (2001). Healthy Eating for Weight Management (Nutrition and Fitness for Teens). United States: Life Matters.

Favor, L. J. (2008). Weighing in: Nutrition and Weight Management. United States: Marshall Cavendish Benchmark.

Mason, Charlie (2021). Fitness Nutrition (fitness nutrition weight muscle food guide your loss health fitness books). (n.p.): Tilcan Group Limited.

Storlie, Jean & Jordan, Henry A. (2013). Nutrition and Exercise in Obesity Management. Netherlands: Springer Netherlands.

Rankin, H. (2004). The TOPS Way to Weight Loss: Beyond Calories and Exercise. United States: Hay House.

Bailor, J. (2012). The Smarter Science of Slim: What the Actual Experts Have Proven about Weight Loss, Health, and Fitness. United States: SANE Solution.

Wohlrabe M. D., H., Riverón, I. (2016). Healthy and Lean: The Science of Metabolism and the Psychology of Weight Management. United States: Lulu Publishing Services.

Chatterjee, A. (2018). The Science Behind the Fad: Understanding Weight Loss. (n.p.): Amazon Digital Services LLC - KDP Print US.

Evaluation: 2 credits (Total marks 50)

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Journal	5
Continuous Evaluation: Assessment of case studies	15
Class participation and evaluation	5
Total	**25**

SEMESTER END EXAM	**Marks**
All questions are compulsory with internal choice.	
Question 1 from unit 1	10
Question 2 from unit 2	10
Question 3: Viva-voce examination	5
Total	**25**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - IV)

Course Code	Course Title	Th/Pr	Credits
SN04C2A	Nutrition for Sports Persons with Special Conditions	**Theory**	**2**

Course Objectives:

To enable students understand

1. Identify nutritional considerations and challenges specific to athletes with special conditions, including energy metabolism, nutrient absorption, and dietary restrictions.
2. Explain the role of nutrition in managing symptoms and optimizing performance in athletes with diabetes, allergies, gastrointestinal disorders, and autoimmune conditions.
3. Apply knowledge of sports nutrition principles to develop personalized dietary plans for athletes with special conditions, considering individual needs, health goals, and sport-specific demands.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcomes
CO1	Identify dietary restrictions and considerations for athletes with special conditions
CO2	Explain how different medical conditions impact nutrient absorption, metabolism, and utilization in athletes
CO3	Implement strategies to manage hydration, electrolyte balance, and nutrient intake for athletes with special dietary needs.
CO4	Analyze case studies of athletes with special conditions to assess the effectiveness of nutrition interventions.
CO5	Critique current practices and recommendations regarding nutrition for athletes with special conditions based on scientific evidence.
CO6	Develop comprehensive nutritional plans integrating sports nutrition principles and medical guidelines for athletes with special conditions.

Unit No.	Course Content	No. of Hours
I.	A, Nutrition for child, adolescent, and master athletes- • Process of growth and development during childhood and adolescence, Factors influencing with special emphasis on exercise • Physiology of aging and factors influencing; • Nutritional problems of younger and master athletes • Nutritional guidelines and Nutritional Requirements for younger and older athletes. • Nutritional concerns of traveling and vegan athletes • Athletes performing under altered climatic conditions: High altitude, • Mountaineers, High and low climatic temperatures, etc. • Nutrition guidelines for athletes for weight management: Factors influencing weight management in athletes (e.g., sport type, position, training volume, injuries, and on and off-season period), Energy Balance and Weight Management, Types of Sports with Weight Restrictions, Methods athletes use to lose weight, nutrition for weight gain and weight loss • Nutritional Management of Exercise Injuries	**15**

II.	A. Management of selected nutritional problems among sportspersons • Anaemia - causes, consequences, and role of nutrition in the prevention and management • Osteoporosis - Bone Physiology, Effect of Nutrition, age, sex and exercise on bone health, Preventive and curative strategies of osteoporosis B. Nutritional Management of clinical conditions among sports – • Diabetes Mellitus - Etiology, Pathophysiology, metabolic alterations, Complications, Assessment and Management. • Hypertension and Heart disease -Prevalence, Pathophysiology, Role of Macro & Micronutrients. • Gastro-Intestinal Disorders: Peptic Ulcer, GERD, IBS, etc., Etiology, Pathophysiology and Effect of Exercise	**15**
	Total Contact Hours	**30**

References

Fink, H. H., Mikesky, A. E., Burgoon, L. A. (2011). Practical Applications in Sports Nutrition. United States: Jones & Bartlett Learning.

Pérez Sira, E. E. (2021). Foods for Special Dietary Regimens. Singapore: Amazon Digital Services LLC - Kdp.

Gazzillo Diaz, L. (2013). Survey of Athletic Injuries for Exercise Science. United States: Jones & Bartlett Learning.

Bernadot, Dan (1999) Nutrition for serious Athletes, Human Kinetics USA.

Browns, Fred and Caustan, Cargill (2002) Essentials of Sports Nutrition – 2nd edition John Wiley and Sons,

Burke, L. Y.and Deking, V. (2006) Clinical Sports Nutrition (3rd ed.), Tata McGraw Hill Pub. England.

Summerfield, Lianne, M. (2001) Nutrition Exercise and Behaviour An integrated approach to weight

Wolinksy, I. (1998) Nutrition in Exercise and Sports CRC press NY.

Wolinsky, Ira and Driskell, J. (2004) Nutritional Ergogenic aids, CRC Press NY. Management, Belmount (USA). Wadsworth/Thompson Learning

Evaluation:

2 credits (Total marks 50)

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Preparation of Powerpoint presentations on topics assigned / Literature review with class discussion	10
Quiz/ Debate/ Class discussion/ Class test	10
Class participation and evaluation	5
Total	**25**

SEMESTER-END EXAMINATION	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from multiple units	5
Total	**25**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - IV)

Course Code	Course Title	Th/Pr	Credits
SN04C2BP	Diet Planning for Sports Persons with Special Conditions	Practical	2

Course Objectives:

To enable students to

1. Identify nutritional considerations and challenges specific to athletes with special conditions, including energy metabolism, nutrient absorption, and dietary restrictions.
2. Explain the role of nutrition in managing symptoms and optimizing performance in athletes with diabetes, allergies, gastrointestinal disorders, and autoimmune conditions.
3. Apply knowledge of sports nutrition principles to develop personalized dietary plans for athletes with special conditions, considering individual needs, health goals, and sport-specific demands.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcomes
CO1	Identify dietary restrictions and considerations for athletes with special conditions
CO2	Explain how different medical conditions impact nutrient absorption, metabolism, and utilization in athletes
CO3	Implement strategies to manage hydration, electrolyte balance, and nutrient intake for athletes with special dietary needs.
CO4	Analyze case studies of athletes with special conditions to assess the effectiveness of nutrition interventions.
CO5	Critique current practices and recommendations regarding nutrition for athletes with special conditions based on scientific evidence.
CO6	Develop comprehensive nutritional plans integrating sports nutrition principles and medical guidelines for athletes with special conditions.

Unit No.	Course Content	No. of Hours
I.	Planning and preparation of diets for • Younger and older athletes of various categories groups, gender and sports types • Traveling athletes • Vegan athletes • Athletes with physical disabilities/Paraplegic athletes/Injured Athletes • Master/Older Athletes • Athletes performing under altered climatic conditions • High altitude • Mountaineers • High and low climatic temperatures	**30**
II.	Planning and preparation of diets for sports persons suffering from • Anemia and osteoporosis • Development of micronutrient-rich recipes and sports drinks Planning and preparation of diets for • Diabetes mellitus • Hypertension, atherosclerosis • Gastrointestinal diseases: Peptic Ulcer, GI disturbance due to anxiety, Celiac disease, IBS	**30**
	Total Contact Hours	**60**

References:

Fink, H. H., Mikesky, A. E., Burgoon, L. A. (2011). Practical Applications in Sports Nutrition. United States: Jones & Bartlett Learning.

Pérez Sira, E. E. (2021). Foods for Special Dietary Regimens. Singapore: Amazon Digital Services LLC - Kdp.

Gazzillo Diaz, L. (2013). Survey of Athletic Injuries for Exercise Science. United States: Jones & Bartlett Learning.

Burkee, L. and Deakin, V. (2006) Clinical sports nutrition (3rdEd.) The McGraw Hill Companies

Mahan, L.K. and Escott-Stumps, S. (2000) Krause's food, nutrition & diet therapy (11thEd.)CRC press.

Evaluation: 2 credits (Total marks 50)

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Journal	5
Continuous Evaluation: Assessment of case studies	15
Class participation and evaluation	5
Total	**25**

SEMESTER END EXAM	**Marks**
All questions are compulsory with internal choice.	
Question 1 from unit 1	10
Question 2 from unit 2	10
Question 3: Viva-voce examination	5
Total	**25**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - IV)

Course Code	Course Title	Th/Pr	Credits
SN04C3	**Entrepreneurship and Management In the Sports Industry**	**Theory**	**4**

Course Objectives:

1. Define entrepreneurship in the context of the sports industry, including key concepts such as innovation, opportunity recognition, and business planning.
2. Apply entrepreneurship principles to develop business ideas, plans, and strategies specific to the sports industry.
3. Assess the effectiveness of entrepreneurial strategies and management practices in achieving business goals and objectives within the sports industry.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcomes
CO1	Identify different types of businesses and organizations within the sports industry
CO2	Summarize the impact of economic factors, market trends, and consumer behavior on sports business ventures
CO3	Apply entrepreneurial strategies to develop business plans for sports-related startups or ventures
CO4	Compare different management styles and their effectiveness in various segments of the sports industry.
CO5	Judge the impact of technology and globalization on entrepreneurship and management practices in the sports industry.
CO6	Develop innovative business ideas or solutions to address emerging challenges or opportunities in the sports industry.

Unit No.	Course Content	No. of Hours
I.	A. Marketing and Marketing Management process ● Concepts of marketing ● Channels of distribution ● Market Research and Marketing strategies ● Market segmentation, targeting and positioning ● Novel and innovative product /service development ● Brand development and promotion ● Concepts of Human Resource Management ● Recruitment and selection ● Training and development ● Performance appraisal ● Personnel action, retention and productivity improvement ● Overview of Labour management and relations. ● Supply Chain Management	**15**

II.	A. Entrepreneurship ● Definition and meaning of entrepreneurship ● Types, Classification and trends of Entrepreneurial ventures in sports industries ● Qualities and skills of an entrepreneur ● Resources required for a business ● Project formulation, evaluation and feasibility analysis ● Idea generation ● Market research ● Project selection ● Project evaluation using appropriate industry standards ● Business planning ● Importance, purpose and efficiency of a plan ● Business acquisition, franchising and outsourcing ● Legal, ethical and environmental considerations of the entrepreneurial venture ● Overview of business regulation by the government ● Inspection, Licensing ●	**15**
III	A. Financial considerations of entrepreneurship ● Funding for the business proposal ● Government and non-government opportunities for funds and resources. ● Franchising opportunities ● Product pricing and profit generation ● Tools of analysis of costing, cost control and budgeting ● Accounting procedures and financial statements. ● Investing resources into the business ● Corporate Social Responsibility ●	**15**
IV	IPR **A. Introduction to Intellectual Property Rights (IPR)** • Overview of IPR: trademarks, copyrights, patents, and trade secrets • Importance of IPR in innovation, creativity, and business competitiveness • Fundamentals of legal systems B. **Trademarks in Sports** • Basics of trademark law and registration processes • Protection of team logos, mascots, and athlete endorsements C. **Copyrights in Sports** • Understanding copyright law and its application in sports media • Protection of broadcasts, sports commentary, and promotional materials • Digital rights management and online streaming issues • **Patents and Innovations in Sports Technology** • Role of patents in protecting sports equipment and technology innovations • Case studies on patent disputes in sports technology • Patent licensing and strategic partnerships in sports innovation	**15**
	Total Contact Hours	**60**

References:

Pandey, N., Dharni, K. (2014). Intellectual Property Rights. India: Phi Learning.

Radhakrishnan, R. (2008). Intellectual Property Rights: Text and Cases. India: Excel Books.

Yadav, A. (2020). Intellectual property. Analysis of the general concept and roots of its rights in Indians systems. Germany: GRIN Verlag.

Champion, W. T., Willis, K. D., Thornton, P. K. (2014). Intellectual Property Law in the Sports and Entertainment Industries. United Kingdom: Bloomsbury Academic.

Champion, W. (2014). Intellectual Property Law in the Sports and Entertainment Industries. United Kingdom: ABC-CLIO.

Reference Guide to Sustaining Sport and its Development through Intellectual Property Rights.. (2023). (n.p.): WIPO.

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Boyd, H.W., Walker, O.C. and Larreche, J. (1995) Marketing management – A strategic approach with a global orientation 2nd ed. Irwin Chicago.

Cartwright, R., Collins, M., Green, G. and Candy, A. (2001). The handbook for managing resources and information Infinity books, New Delhi.

Ivancevich, J.M., Donnelly, J.H. and Gibson, J.L. (1996). Management – principles and functions (4th ed.) All India Traveller Bookseller. Delhi.

Kale, N.G. (2003) Principles and practice of marketing. Vipul prakashan – Mumbai.

Rao, V.S.P. (2005) Human resource management – text and cases (2nd ed.) Excel Books. New Delhi.

Shookla, M.S. (2004). A handbook of human relations (with structured experiences and instruments). Macmillan India Ltd. Delhi.

Singh, P.N. (1998). Developing and managing human resources (3rd ed.) Suchandra Publications. Mumbai.

Evaluation:
4 credits (Total marks 100)

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Written and oral presentations on assigned topic / Literature review with class discussion/ Creating learning resources (videos or posters or brochures)	20
Class test/ Quiz/ Group Discussion	20
Class participation and evaluation	10
Total	**50**
SEMESTER-END EXAMINATION	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from Unit 3	10
Question 4 from Unit 4	10
Question 5 from multiple units	10
Total	**50**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - IV)

Course Code	Course Title	Th/Pr	Credits
SN04C4E1A	Food Psychology and Nutrition Counseling	**Theory**	**2**

Course Objectives:

1. Summarize and interpret research findings on the psychological aspects of eating behavior, food preferences, and eating disorders.
2. Apply food psychology principles to analyze and address common challenges in dietary adherence and behavior change during nutrition counseling sessions.
3. Develop comprehensive nutrition counseling programs and resources integrating food psychology principles, dietary guidelines, and behavioral strategies for diverse client populations.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcomes
CO1	Recall key theories and principles of food psychology and nutrition counseling.
CO2	Explain the relationship between psychological factors (such as emotions, stress, and culture) and eating behaviors.
CO3	Implement counseling techniques to promote behavior change and adherence to nutritional recommendations.
CO4	Evaluate the effectiveness of different nutrition counseling approaches in achieving behavioral change.
CO5	Assess the impact of psychological interventions on dietary compliance and long-term health outcomes.
CO6	Create educational materials or resources for clients addressing psychological aspects of nutrition and health.

Unit	Course Content	Periods
Unit I	• **The psychology of food choices, food Purchase, and eating behavior** • Models of food choice • Biological & Genetic influences on energy and nutrient intake • Neurobiology of food intake • Social and psychological models of food choice • Factors affecting food choices- Role of family and peers, Food and Culture, Mood , emotions and food choice, Food cravings and addiction, Food Rewards,media Stress, Ethnic, religious and economic influences, food choices across the lifespan. • Factors affecting purchase of food/supplements/ergogenic aids • **Applications of food psychology and counselling in pediatric and adult athletes** • Strategies to change dietary behaviour • Psychology of taste and Taste aversion • Role of experience in the development of child's eating behavior.	15

	• Behavior modification strategies to influence food and nutrition choices • Theory of planned behavior and healthy eating • Strategies to change dietary behaviour (Mindful eating, Implementations intention, REBT, stages of change model, Health coaching and others	
Unit II	**A. Communication** • Overview of communication: definitions, models, and theories • Importance of communication in personal, social, and professional contexts • Types of communication: verbal, nonverbal, written, and digital • Active listening and empathetic communication • Professional Communication- formal and informal channels, Writing effective emails, memos, and reports, Presenting ideas confidently and persuasively • Barriers of communication **B. Nutritional Care Process and Counseling Strategies** • Nutritional Care Process; Role and skills of a sports dietician. • Detailed study of Nutrition Counseling theories and strategies • Stress management & Counselling • Tools of psychological testing • Counseling of - individual and team sports persons, coaches, paediatric athletes and para-athletes, Alcohol and tobacco use and abuse	15
	Total hours	30

References:

Chaffee, L. R., Silva, S. P. d. (2022). A Guide to the Psychology of Eating. United Kingdom: Bloomsbury Publishing.

Booth, D. (2016). The Psychology of Nutrition. United Kingdom: Taylor & Francis.

Rappoport, L. (2010). How We Eat: Appetite, Culture, and the Psychology of Food. United States: Ecw Press.

Krogerus, M., Tschäppeler, R. (2018). The Communication Book: 44 Ideas for Better Conversations Every Day. United Kingdom: Penguin Books Limited.

Graziano, R. (2017). Nutritional Counselling. How To Motivate People To Correct Their Eating Habits. United States: Babelcube Incorporated.

Snetselaar, L. (2006). Nutritional Counseling for Lifestyle Change. United Kingdom: CRC Press.

Robert S. Weinberg and Daniel Gould (2006) Foundations of Sport and Exercise Psychology

Arnold LeUnes (2011) Introducing Sport Psychology: A Practical Guide.

Mike Kane (2015) Sports Psychology: The Ultimate Guide For Mastering The Mental Aspects Of Sports Performance

Ellis Cashmore (2002) Sport and Exercise Psychology: The Key Concepts (Routledge Key Guides)

Evaluation:

2 credits Total marks 50

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Written and oral presentations on assigned topic / Literature review with class discussion	10
Class test/ debate/Quiz	10
Class participation and evaluation	5
Total	**25**
SEMESTER-END EXAMINATION	**Marks**
All questions are compulsory. Up to 50% choice to be given within each question.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from multiple units	5
Total	**25**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - IV)

Course Code	Course Title	Th/Pr	Credits
SN04C4E1BP	Food Psychology and Nutrition Counseling	**Practical**	**2**

Course Objectives:

To enable students to

1. Summarize and interpret research findings on the psychological aspects of eating behavior, food preferences, and eating disorders.
2. Apply food psychology principles to analyze and address common challenges in dietary adherence and behavior change during nutrition counseling sessions.
3. Develop comprehensive nutrition counseling programs and resources integrating food psychology principles, dietary guidelines, and behavioral strategies for diverse client populations.

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

Course Outcome No.	Course Outcomes
CO1	Recall key theories and principles of food psychology and nutrition counseling.
CO2	Explain the relationship between psychological factors (such as emotions, stress, and culture) and eating behaviors.
CO3	Implement counseling techniques to promote behavior change and adherence to nutritional recommendations.
CO4	Evaluate the effectiveness of different nutrition counseling approaches in achieving behavioral change.
CO5	Assess the impact of psychological interventions on dietary compliance and long-term health outcomes.
CO6	Create educational materials or resources for clients addressing psychological aspects of nutrition and health.

Unit	Course Content	Periods
Unit I	• Conduct a review of literature in the area of food psychology and eating behaviour using various resources: o The various factors that influence food choices o Alternative Food Pathways and Eating Preferences o Food ethics, Cultural/Ethnic influence on food choices, o Identity - Divided Identities: Food and Gender/Class Differences. Food and Politics, rights and law with reference to food. • Survey on how today's Media, Food Marketing, and Globalization have affected the psychology of food purchase among people and how it has contributed to overall health challenges. • Conducting multilingual Nutrition Seminars in and outside the college for multiple age groups and ethnicities.	30
Unit II	• Creating aids for Nutrition education - posters, brochures, etc. • Class demonstration of Nutritional counseling for different categories of people (Children, geriatric, sports person, etc.)	30
	Total Hours	**60**

References:

Chaffee, L. R., Silva, S. P. d. (2022). A Guide to the Psychology of Eating. United Kingdom: Bloomsbury Publishing.

Booth, D. (2016). The Psychology of Nutrition. United Kingdom: Taylor & Francis.

Rappoport, L. (2010). How We Eat: Appetite, Culture, and the Psychology of Food. United States: Ecw Press.

Krogerus, M., Tschäppeler, R. (2018). The Communication Book: 44 Ideas for Better Conversations Every Day. United Kingdom: Penguin Books Limited.

Graziano, R. (2017). Nutritional Counselling. How To Motivate People To Correct Their Eating Habits. United States: Babelcube Incorporated.

Snetselaar, L. (2006). Nutritional Counseling for Lifestyle Change. United Kingdom: CRC Press.

Robert S. Weinberg and Daniel Gould (2006) Foundations of Sport and Exercise Psychology

Arnold LeUnes (2011) Introducing Sport Psychology: A Practical Guide.

Mike Kane (2015) Sports Psychology: The Ultimate Guide For Mastering The Mental Aspects Of Sports Performance

Ellis Cashmore (2002) Sport and Exercise Psychology: The Key Concepts (Routledge Key Guides)

Evaluation:

2 credits Total marks 50

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Journal	5
Continuous Evaluation: Meal Planning	15
Class participation and evaluation	5
Total	**25**

SEMESTER-END EXAMINATION	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3: Viva- voce examination	5
Total	**25**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - IV)

Course Code	Course Title	Th/Pr	Credits
SN04C4E2A	Novel and emerging strategies for health, wellness and fitness	**Theory**	**2**

Course Objectives-

To enable students to:

1. Understand the characteristics, physiology and body composition needs of Para sport athletes
2. Assess the role of gut microbiome in health management
3. Apply the knowledge of nutrigenomics in disease prevention and treatment

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

Course Outcome No.	Course Outcomes
CO1	Identify key genetic factors and biomarkers that influence individual responses to diet and nutrition.
CO2	Summarize the special considerations and nutritional challenges associated with specific disabilities such as spinal cord injuries and amputations.
CO3	Apply knowledge of the gut microbiome to understand its role in sports performance and disease management.
CO4	Analyze the influence of exercise on the gut microbiome composition, diversity, and function in para-athletes.
CO5	Assess the potential implications of nutrigenomics in disease prevention and treatment, specifically related to conditions relevant to para-sports participants.
CO6	Develop personalized nutrition plans integrating nutrigenomics insights and gut microbiome modulation strategies for para-athletes.

Unit No.	Course Content	No. of Hours
I.	**A. Nutrition for Para sports** • Overview of para-sports, their unique nutritional needs and its importance • Basics of macronutrients (carbohydrates, proteins, fats) and micronutrients (vitamins and minerals) • Nutritional Strategies for Optimal Performance, Injury Prevention and Recovery • Special considerations for specific disabilities (e.g., spinal cord injuries, amputations) • Medical issues, pharmacology and nutrient interactions **B. Gut microbiome for sports, health and disease management** • Introduction to Gut Microbiome and its Role in Health- composition, diversity, and functions • Influence of gut microbiota on digestion, nutrient absorption, and metabolism • Effects of exercise on the gut microbiome composition and diversity • Nutritional and Therapeutic approaches to modulate the gut microbiome for improved sports performance	**15**

	• Gut Microbiome in Health and Disease Management • Gut-brain axis: impact of gut microbiota on mental health and cognitive function • Gut microbiota dysbiosis: causes, consequences, and interventions	
II.	**A. Nutrigenomics** • Introduction to Nutrigenomics- Overview of human genome and nutritional genomics • Basics of Genetics and Genomics- DNA structure and function, Gene expression and regulation • Nutritional epigenomics • Nutrient-Gene Interactions- macronutrients, micronutrients and functional foods • Nutrigenomics in disease prevention and treatment- obesity, cancer, diabetes, cardiovascular diseases and metabolic syndrome • Nutrigenomics in fitness and sports- Somatotype studies, Genetic variants determining sports choice and sports performance, Nutrigenomics based interventions for sportspersons and fitness enthusiasts • Ethical, Legal, and Social Issues in Nutrigenomics • Future directions in Nutrigenomics	**15**
	Total Contact Hours	**30**

References:

Sports Nutrition for Paralympic Athletes, Second Edition. (2019). United States: CRC Press.

Fink, H. H., Mikesky, A. E., Burgoon, L. A. (2011). Practical Applications in Sports Nutrition. United States: Jones & Bartlett Learning.

Carlberg, C., Ulven, S. M., Molnár, F. (2016). Nutrigenomics. Germany: Springer International Publishing.

Principles of Nutrigenetics and Nutrigenomics: Fundamentals of Individualized Nutrition. (2019). Netherlands: Elsevier Science.

Nutrigenomics and Proteomics in Health and Disease: Towards a Systems-level Understanding of Gene-diet Interactions. (2017). Germany: Wiley.

Nutrigenomics and Nutrigenetics in Functional Foods and Personalized Nutrition. (2016). United Kingdom: CRC Press.

Pemberton, A. (2022). Using Nutrigenomics Within Personalized Nutrition. United Kingdom: Jessica Kingsley Publishers.

Nutrigenomics and Nutraceuticals. (2024). United States: Apple Academic Press, Incorporated.

Ishiguro, E., Haskey, N., Campbell, K. (2023). Gut Microbiota: Interactive Effects on Nutrition and Health. Netherlands: Elsevier Science.

Haff, G. G. (2008). Essentials of Sports Nutrition and Supplements. Netherlands: Humana Press.

Wilson, P. (2020). The Athlete's Gut: The Inside Science of Digestion, Nutrition, and Stomach Distress. United States: VeloPress.

Advances in Host Genetics and Microbiome in Lifestyle-related Phenotypes. (2024). United States: Elsevier Science.

Evaluation:

2 credits (Total marks 50)

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Create a resource on para sport athletes and applications of Nutrigenomics in specified aspect/ disease conditions for a health professional	10
Swayam/ MOOC/ any online certification course conducted by qualified practitioner with submission of completion certificate	10
Class participation and evaluation	5
Total	**25**

SEMESTER-END EXAMINATION	**Marks**
All questions are compulsory. Up to 50% choice to be given within each question.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3 from multiple units	5
Total	**25**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - IV)

Course Code	Course Title	Th/Pr	Credits
SN04C4E2A	Novel and emerging strategies for health, wellness and fitness	**Practical**	**2**

Course Objectives

To enable students to:

1. Understand the characteristics, physiology and body composition needs of Para sport athletes
2. Assess the role of gut microbiome in health management
3. Apply the knowledge of nutrigenomics in disease prevention and treatment

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

Course Outcome No.	Course Outcomes
CO1	Identify key genetic factors and biomarkers that influence individual responses to diet and nutrition.
CO2	Summarize the special considerations and nutritional challenges associated with specific disabilities such as spinal cord injuries and amputations.
CO3	Apply knowledge of the gut microbiome to understand its role in sports performance and disease management.
CO4	Analyze the influence of exercise on the gut microbiome composition, diversity, and function in para-athletes.
CO5	Assess the potential implications of nutrigenomics in disease prevention and treatment, specifically related to conditions relevant to para-sports participants.
CO6	Develop personalized nutrition plans integrating nutrigenomics insights and gut microbiome modulation strategies for para-athletes.

Unit No.	Course Content	Hours
I.	**Planning and preparation of the diets for Para sport athletes:** • Planning diets using Medical Nutrition Therapy to prescribe energy, macronutrients, fiber, micronutrients and fluids • Supplement usage **Planning and preparation of the diets to improve gut health:** • Planning diets using Medical Nutrition Therapy to prescribe energy, macronutrients, fiber, micronutrients and fluids • Supplement usage	**30**
II.	**Interpretation of Nutrigenomic tests to assess risk and subsequent planning and preparation of the prescribed therapeutic diets for specific conditions in the following detail:** • Planning diets using Medical Nutrition Therapy to prescribe energy, macronutrients, fiber, micronutrients and fluids based on the nutrigenomic report • Detailed calculation to understand the efficacy of the plan • Supplements, neutraceutical prescription and functional foods usage in the prescription based on the nutrigenomic report	**30**
	Total Contact Hours	**60**

References:

Sports Nutrition for Paralympic Athletes, Second Edition. (2019). United States: CRC Press.

Fink, H. H., Mikesky, A. E., Burgoon, L. A. (2011). Practical Applications in Sports Nutrition. United States: Jones & Bartlett Learning.

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Haff, G. G. (2008). Essentials of Sports Nutrition and Supplements. Netherlands: Humana Press.

Wilson, P. (2020). The Athlete's Gut: The Inside Science of Digestion, Nutrition, and Stomach Distress. United States: VeloPress.

Advances in Host Genetics and Microbiome in Lifestyle-related Phenotypes. (2024). United States: Elsevier Science.

Evaluation:

2 credits Total marks 50

CONTINUOUS INTERNAL EVALUATION:	**Marks**
Journal	5
Continuous assessment of planning and preparation for diets for Para sport athletes, interpretation of nutrigenomic tests and meal planning for specific conditions	15
Class participation and evaluation	5
Total	**25**

SEMESTER-END EXAMINATION	**Marks**
All questions are compulsory with internal choice.	
Question 1 from Unit 1	10
Question 2 from Unit 2	10
Question 3: Viva- voce examination	5
Total	**25**

Syllabus
M.Sc. (Sports Nutrition)
(Sem. - IV)

Course Code	Title	Th/Pr	Credits	Hours
SN04C5	**Research Project**	**Research**	**6**	**180**

Course Objectives:

1. To provide students with an opportunity to conduct independent research under supervision in Sports nutrition and allied areas.
2. To encourage students to work in conjunction with relevant food industries, institutes, Governmental and non-governmental agencies, gyms, clinics, schools, sports and fitness ventures, entrepreneurs, communities and other relevant agencies.
3. To assist students in developing general research skills as well as research skills specific to their specialization.
4. To encourage students to adopt best practices in research.
5. To facilitate students in completing data collection/data entry/data analysis, and writing the remaining chapters of the dissertation (Results and Discussion, Summary and conclusion and limitations and recommendations).
6. To support students in: (a) completing and submitting the dissertation for the viva voce examination, (b) integrating feedback and submitting the final copy of the dissertation, and (c) writing a research paper using the findings of their research

Course Outcomes (CO):

On successful completion of the course, the student will be able to:

CO No.	Course Outcome
CO1	Demonstrate the ability to design and conduct independent research projects in the field of Sports Nutrition and related disciplines, under the guidance of faculty mentors.
CO2	Establish effective partnerships and collaborations with relevant industries, sports and fitness ventures, institutes, schools, and other stakeholders to enrich research endeavors and enhance practical applications of research findings.
CO3	Develop and apply advanced research methodologies, techniques, and tools specific to their area of specialization, while also honing general research skills such as critical thinking, problem-solving, and data analysis.
CO4	Adhere to ethical standards and best practices in research, including the responsible conduct of research, proper citation and referencing, and maintaining integrity in data collection, analysis, and reporting.
CO5	Successfully complete key milestones in the research process, including formulating and defending a well-structured research proposal, initiating data collection procedures, and drafting the initial chapters of the dissertation (Introduction and Review of Literature; Methodology) with clarity, coherence, and scholarly rigor.

Unit No.	Course Content	No. of Hours
I.	**Completing Laboratory Work/Product Development/ Data Collection** **Completing Data Entry and Preliminary Analyses** • Entering all data; checking for data entry errors; running preliminary analyses. • Analyzing Data and Reporting Results Analyzing data; interpreting findings; reporting results in figures/tables and text using scientific protocol; writing the third chapter of the dissertation, namely, the Results, by research objectives/ questions/hypotheses; orally presenting the results and integrating feedback **Discussing Findings and Write Results and Discussions** • Corroborating own findings with those in previous research and theory • Explaining findings using relevant literature and communication with experts • Discussing implications of findings for practice/ industry/family/society • Suggesting recommendations for future research; writing the fourth chapter of the dissertation, namely, the Discussion, using appropriate scientific protocol	**90**
II.	**Discussing Findings and Write Results and Discussions** • Corroborating own findings with those in previous research and theory • Explaining findings using relevant literature and communication with experts • Discussing implications of findings for practice/ industry/family/society Suggesting recommendations for future research; writing the fourth chapter of the dissertation, namely, the Discussion, using appropriate scientific protocol **Submission and Oral Defence; Writing of the Research Paper** • Orally defending the dissertation; integrating feedback into the final document; submitting the completed dissertation (hard copy and soft copy). • Using the dissertation to write a research paper; submitting the research paper (hard copy and soft copy)/ Present the findings at Avishkar/Indian Science Congress or any other Conference	**90**

References:

Dissertations in the College Library
Relevant Research Literature as per selected topic from scientific journals, dissertations, theses, books, literature on the internet.

Evaluation (Total Marks 100):

Continuous Internal Evaluation	Marks
Research Guide's Evaluation for Examining the Student's expertise with regard to Research: Proactive / Initiative / Responsibility / Flexibility/ Receptivity to feedback/ Thoroughness/ Meeting deadlines / Regularity in meeting/ Ethics / Absence of Plagiarism/ Networking, collaboration/ contacting experts.	25
Research Guide's Evaluation for Examining the Quality of Chapters 1 and 2 of the M.Sc. Dissertation: Less focus on Chapters 1 and 2; More focus on Chapters 3 (most) and 4.	25
Total	**50**

Semester-end Examination	Marks
External Examiner's Evaluation of the Submitted Document: • Chapter 2 (Method) – Sample Characteristics; Measurement and Plan of Analysis • Chapter 3 (Results) – Relevance to research aim/objectives/hypotheses; Accuracy; Clarity; Organization • Chapter 4 (Discussion) – Linkage to Indian and Non-Indian Literature • Overall Quality of the Written Document	25
External Examiner's Evaluation through Viva Voce, of Student's expertise with regard to Research: Clarity/Soundness/Accuracy with regard to Sample Characteristics; Measurement and Plan of Analysis; Ability to interpret, explain and communicate results of the study; Clarity/Soundness/Accuracy with regard to the discussion of findings; Originality/Insightfulness with regard to interpretation, explanation and discussion of findings; Overall rating of student's emerging research expertise	25
Total	**50**

Letter Grades and Grade Points:

Semester GPA/ Programme CGPA Semester/ Programme	% of Marks	Alpha-Sign/ Letter Grade Result
9.00 - 10.00	90.0 - 100	O (Outstanding)
8.00 - < 9.00	80.0 - < 90.0	A+ (Excellent)
7.00 - < 8.00	70.0 - < 80.0	A (Very Good)
6.00 - < 7.00	60.0 - < 70.0	B+ (Good)
5.50 - < 6.00	55.0 - < 60.0	B (Above Average)
5.00 - < 5.50	50.0 - < 55.0	C (Average)
4.00 - < 5.00	40.0 - < 50.0	P (Pass)
Below 4.00	Below 40.0	F (Fail)
Ab (Absent)	-	Absent

Sign of the BOS Chairman
Name of the Chairman
BOS in Home Science

Sign of the Offg. Associate Dean
Name of the Associate Dean
Faculty of

Sign of the Offg. Associate Dean
Name of the Associate Dean
Faculty of

Sign of the Offg. Dean
Name of the Dean
Faculty of