

# Faculty of Sports Medicine & Physiotherapy

## SYLLABUS

### FOR

### M.Sc. SPORTS NUTRITION (SEMESTER: I – IV) (Credit Based Evaluation and Grading System)

Session: 2019-20



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# GURU NANAK DEV UNIVERSITY AMRITSAR

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M.Sc. (Sports Nutrition) (Semester System)  
(Credit Based Evaluation and Grading System)

**Semester – I:**

Course No.	C/E/I	Course Title	L	T	P	Total Credits	Marks (Mid Semester + Major Exam)
<b>Core Courses</b>							
SNL 401	C	Human Nutrition and Metabolism	4	0	0	4	20+80:100
SNL 402	C	Human Physiology	4	0	0	4	20+80:100
SPL504	C	Research and Educational Methodology	4	0	0	4	20+80:100
SNL 403	C	Fundamentals of Psychology and Counseling for Behaviour Change	4	0	0	4	20+80:100
SNP 410	C	Basics of Nutrition and diet analysis Practical	0	0	8	4	* C.F.
SND461	C	Dissertation	0	0	6	6	* C.F.
SNE462	C	Clinical Training-I	0	0	6	3	* C.F.
<b>Total</b>			16	0	20	29	

\* C.F. (carried forward to 4<sup>th</sup> semester)

**Semester – II:**

**\*List of Elective Courses:**

Course No.	C/E/I	Course Title	L	T	P	Total Credits	Marks (Mid Semester + Major Exam)
<b>Core Courses</b>							
SNL 451	C	Therapeutic Nutrition	4	0	2	5	20+80:100
SNL 452	C	Dietary Supplements and Functional Foods	4	0	0	4	20+80:100
SNL 453	C	Weight Management, Rehabilitation and Fitness	4	0	2	5	20+80:100
SNL 454	C	Exercise Physiology	4	0	0	4	20+80:100
SND 461	C	Dissertation	0	0	6	6	* C.F.
SNE463	C	Clinical Training-II	0	0	6	3	* C.F.
<b>Elective Course (3 Credits)</b>							
	E	<b>Elective Course/Optional Course</b>	3	0	0	3	20+80:100
<b>Total</b>			19	0	16	30	

1. Evidence Based Practice in Allied Health Sciences – SPL590

2. Women Health and Exercise – SPL591

**Note:-**

**PSL-053 ID Course Human Rights & Constitutional Duties (Compulsory Paper)**  
Students can opt. in any semester except Semester 1<sup>st</sup>. This ID Paper is one of the total ID Papers of this course.

M.Sc. (Sports Nutrition) (Semester System)  
(Credit Based Evaluation and Grading System)

**Semester – III:**

Course No.	C/E/I	Course Title	L	T	P	Total Credits	Marks (Mid Semester + Major Exam)
<b>Core Courses</b>							
SNL 501	C	Nutrition for Resistance and Power Sports	4	0	0	4	20+80:100
SNL 502	C	Nutrition for Team Sports	4	0	0	4	20+80:100
SNL 503	C	Dietary planning for team sports, power and endurance sports	4	0	0	4	20+80:100
SYL501	C	Exercise Testing for Health- and Skill-related Components of Fitness	4	0	0	4	20+80:100
SND561	C	Dissertation	0	0	4	4	* C.F.
SNE562	C	Clinical Training-III	0	0	8	4	* C.F.
<b>Interdisciplinary Course</b>							
	I	Interdisciplinary Course	4	0	0	4	20+80:100
<b>Total</b>			20	0	12	28	

**Semester – IV:**

Course No.	C/E/I	Course Title	L	T	P	Total Credits	Marks (Mid Semester + Major Exam)
<b>Core Courses</b>							
SYL551	C	Sport Psychology	4	0	0	4	20+80:100
SNL551	C	Diet Planning for special groups	4	0	0	4	20+80:100
SNL553	C	Food Hygiene and Management	4	0	0	4	20+80:100
SNE561	C	Clinical training-IV	0	0	8	8	*600
SND562	C	Dissertation	0	0	10	5	*600
<b>Total</b>			12	0	18	25	

\* Total marks from I to IV semesters

M.Sc. (Sports Nutrition) (Semester System)  
(Credit Based Evaluation and Grading System)

**A. Theory (Examination)**

**Instructions to Paper Setters:**

The paper setters should set 8 questions (of equal marks), two in each of the four sections (Section A to D, corresponding to the distribution in the syllabi). Further, the paper setters shall be instructed to make sub-sections (not exceeding 4) of the questions and allocate appropriate marks to the each section. The candidates shall be asked to attempt five questions by selecting one question from each section and the fifth question may be attempted from any section.

\* 1 hr of theory and dissertation is counted as 1 credit. 2 hr of practical /clinical training is counted as 1 credit.

**B. Practical Examination**

Practical examination of Clinical Training will be conducted once at the end of 4<sup>th</sup> semester which includes all the practical work during the entire course of four semesters

***Practical Attachments:***

To enable the students to acquire practicing in hand on skills, maximum emphasis will be laid on regular practical classes, demonstration and clinical practice. The students will undergo Clinical / Field training in GNDU Campus / Sports Authority of India (Various Centres), Government Medical College Amritsar, other sporting centres, Fortis Hospital, Nutritional counselling centre GNDU.

**C. Dissertation**

At the end of first semester students are expected to have a research proposal ready. At the end of second semester students are expected to be ready with the pilot study. At the end of third semester data collection, analysis & results should be completed. In fourth semester the work should be presented in the form of final dissertation and manuscript should be ready for communication. The student will be awarded grade for the total number of credits earned in dissertation in I, II, III and IV semesters of study at the end of the IV semester.

\* The credits earned by a candidate in practical and dissertation during different semesters will be evaluated at the end of the 4th semester and the grade will be determined accordingly.

\* A candidate shall be required to maintain minimum of 4 SGPA at the end of each semester. A student getting 'F' grade in any course in this discipline will be treated as having failed in that course and shall have to repeat the core/elective courses/or repeat/opt. another course in lieu of interdisciplinary/outside department course with approval of Board of Control, and will have to obtain at least 'P' grade in that course within specified period as per the prevailing rules. The weights of 'F' Grade will not be counted in SGPA or CGPA (according to syndicate proceeding, dated: 24.5.2010, para no. 34).

Interdisciplinary/Optional Course: to be offered from outside the department

M.Sc. (Sports Nutrition) (Semester-I)  
(Credit Based Evaluation and Grading System)

***SNL401: HUMAN NUTRITION AND METABOLISM***

**L**     **T**     **P**  
**4**     **0**     **0**

**Max Marks: 100**  
**Mid Term: 20**  
**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

1. The Basis of a Healthy Diet
2. Nutritional Classification of Foods
3. Food Pyramid
4. My Plate

**SECTION-B**

1. Classification, structure, functions, absorption and metabolism of carbohydrates, fats and proteins
2. Vitamins
  - a) Fat-Soluble Vitamins
  - b) Water-Soluble Vitamins
3. Minerals
  - a) Major Minerals
  - b) Trace Minerals
4. Antioxidants
5. Fibers

**SECTION-C**

1. Assessment of Nutritional Status
2. Energy Measurement
  - a) Measurement of energy expenditure by direct and indirect calorimetry
  - b) Basal metabolic rate, respiratory quotient, specific dynamic action
  - c) Factors effecting BMR
  - d) Prerequisites of measuring BMR and RMR
  - e) Specific dynamic action of food
  - f) Regulation of energy balance

**SECTION-D**

1. Aerobic energy systems
  - a) Aerobic energy pathways
  - b) Energy Balance and Weight Control
  - c) Causes & Concerns of obesity epidemic
2. Anaerobic energy pathways

M.Sc. (Sports Nutrition) (Semester-I)  
(Credit Based Evaluation and Grading System)

**References:**

1. Groff, James L & Gropper, Sareen S: Advanced nutrition and human metabolism. 3rd ed. Stamford : Wadsworth Publ, 1999.
2. Barasi, Mary E : Human nutrition : a health perspective. London : Arnold, c1997.
3. Present Knowledge in Nutrition. International Life Sciences Institute.
4. Eastwood, Martin & Edwards, Christine & Parry, Doreen : Human nutrition : a continuing debate. London : Chapman & Hall, c1992.
5. The Role of Fats in Human Nutrition/edited by F B Padley and Podmore. Chichester: Ellis Horwood, c1985.(Ellis Horwood Series in Food Science and Techology, edited by I D Morton)
6. Guthrie Helen (1986) Introductory Nutrition. Times Mirror/ Mosby College Publishing.
7. Mudambi, S.R., Rajgopal, M.V.(1990) Fundamentals of Foods and Nutrition, New Age International Pvt. Ltd.
8. Nutrient Requirements and Recommended Dietary Allowances for Indians- I.C.M.R. Publication 1999.
9. Robinsson, and Lawler. (1986) Normal and Therapeutic Nutrition. Mac Millan Pub.Co.
10. Elenaor N., Whitney S., Rady R. (1993): Understanding Nutrition, West Publishing Company, Minneapolis.
11. Wardlaw (1993): Perspectives in Nutrition, Paul Insel Mosby.
12. Bhatia Arti: Nutrition & Dietetics- Anmol Publication Pvt. Ltd.- New Delhi.
13. C. Gopalan, B.V. Ramasastry and S.C. Balasubramanian (1989)- Nutritive Value of Indian Foods. NIN ICMR Hyderabad 500 007

M.Sc. (Sports Nutrition) (Semester-I)  
(Credit Based Evaluation and Grading System)

**SNL402: HUMAN PHYSIOLOGY**

**L      T      P**  
**4      0      0**

**Max Marks: 100**

**Mid Term: 20**

**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

1. Introduction to human physiology, cells, tissues, organs and system organization.
2. Cell structure, transport through cell membrane, Classification of tissue.

**SECTION-B**

1. **Nervous system**- central and autonomic nervous system, organization, Structure and properties of nerve, transmission of impulse, resting and action potential, Reflex action, reflex arc.
2. **Endocrine system** - Different endocrine glands and their hormones, major functions, mode of action, feedback mechanism.
3. **Digestive system**- organs of GI tract and their major functions.

**SECTION-C**

1. **Cardiovascular system**- anatomy of heart and blood vessels, conduction system in heart, Normal ECG. Systemic, coronary and pulmonary circulation. Cardiac cycle, cardiac output and blood pressure.
2. **Respiratory system**- anatomy, mechanism of respiration, lung volume and capacities, external and internal respiration, transport of O<sub>2</sub> and CO<sub>2</sub>
3. **Excretory system** - anatomy, function, renal circulation, auto regulation of the circulation, Structural and functional unit, Urine formation.

**SECTION-D**

1. **Reproductive system**- Male reproductive system-Structure and Function.  
Female reproductive system - Structure and Function, menstrual cycle and pregnancy.
2. **Immune system** - Innate, acquired and active immunity, cell mediated and humoral mediated immunity. Auto immune disease and Immune deficiency disorders.

**References**

1. Understanding Medical Physiology , R.L. Bijlani, (1995) J P Brothers Medical Publishers.
2. Text Book of Medical Physiology, Guyton Hall , (2003)Saunders publishers.
3. Principles of Anatomy and Physiology. Tortora (2003) . John Wiley and sons.
4. Human Physiology, by C.C.Chatterjee, (2002)Medical Allied Agency,

M.Sc. (Sports Nutrition) (Semester-I)  
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***SPL504: Research & Educational Methodology***

**L      T      P**  
**4      0      0**

**Max Marks: 100**

**Mid Term: 20**

**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

1. **Basic concepts**-Importance of research in clinical practice, Problem identification, Ethical issues in research, Literature review, meta-analysis
2. **Types of Research**-Qualitative & Quantitative, Descriptive & Experimental, Longitudinal & Cross-sectional, Survey Research.
3. **Sample Designs**-Types of sampling, Reliability, Validity, Variables, sample size.

**SECTION-B**

1. **Processing and analysis of data**-Central tendency, Dispersion, Correlation, regression analysis, multiple correlation and regression.
2. **Sampling and testing of hypothesis**-Concept of probability, Standard deviation, confidence intervals, null and alternate hypothesis, level of significance, correlation coefficients, ANOVA, Tukey's HSD.
3. **Non parametric tests**-Fisher Irwin test, Mc Nemar test, Wilcoxon Mali test, Mann Whitney test, Kruskal Walis test, Spearman's rank correlation.

**SECTION-C**

1. **Define**-Symposia, Seminar, Conference, Journal, Thesis, Book, Key elements of scientific writing.
2. **Presenting Research**-Strategies of paper writing, Design of paper writing, Tactics of paper writing, Reasons for rejection, Where to publish, Poster presentation (Poster space, Standard format), Plagiarism.
3. **Oral Presentations at Conferences/Seminars**-Preparing presentation, Duration of presentation, what to present

**SECTION-D**

**Educational Methodology**-Principles and methods of teaching with respect to physiotherapy students and client: Strategies and planning of teaching, curriculum development, formation of course objective, time management, role of Audio – visual aids, method of knowledge dissemination.

**Practicals:**

The student will be required to review the literature thoroughly and prepare a research proposal for dissertation in consultation with his/her supervisor by the end of the semester.

**References:**

1. Mohsin S.M.: Research Methods in Behavioral Sciences: Orient Publications.
2. Colton: Statistics in medicine, Little Brown Company, Boston.
3. Mahajan: Methods in Biostatistics, Jay Pee Brothers.
4. Vincent: Statistics in Kinesiology, Human Kinetics.
5. Hicks: Research for Physiotherapists, Churchill Livingstone



M.Sc. (Sports Nutrition) (Semester-I)  
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**SNL403: Fundamentals of Psychology and Counseling for Behaviour Change**

<b>L</b>	<b>T</b>	<b>P</b>
<b>4</b>	<b>0</b>	<b>0</b>

**Max Marks: 100**  
**Mid Term: 20**  
**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

**1. The psychology of food choices, food Purchase and eating behavior**

- a. Models of food choice
- b. Biological & Genetic influences on energy and nutrient intake
- c. Neurobiology of food intake

**2. Social and psychological models of food choice**

Role of family and peers, Food and Culture, mood, emotions and food choice, Food cravings and addiction, Food Rewards

**SECTION-B**

**1. Influences of Media on food choice**

- a. Psychological stress among sports persons & its impact on food choices, consumption and performance
- b. Food choices across the life span.
- c. Ethnic, religious and economic influences on food choices
- d. Factors affecting the consumer healthy food choices

**SECTION-C**

**1. Applications of food psychology for health maintenance and fitness**

- a. Strategies to change dietary behavior
- b. Optimisim and intention
- c. Strategic automisation
- d. Using stages of change model to change dietary behavior
- e. Behavior modification strategies to influence food and nutrition choices
- d. Theory of planned behavior and healthy eating

**SECTION-D**

**Nutritional Care Process and Counseling Strategies**

- a. Nutritional Care Process; Role and skills of a sport dietician.
- b. Detailed study of Nutrition Counseling theories and strategies
- c. Cognitive behavior therapy, Rational Emotive Behavioral Therapy
- d. Stress management & Counseling;
- e. Tools of psychological testing
- f. Counseling of individual sports persons and teams

**References:**

1. Robert S. Weinberg and Daniel Gould (2006) Foundations of Sport and Exercise Psychology
2. Arnold LeUnes (2011) Introducing Sport Psychology: A Practical Guide.
3. Mike Kane (2015) Sports Psychology: The Ultimate Guide For Mastering The Mental Aspects Of Sports Performance
4. Ellis Cashmore (2002) Sport and Exercise Psychology: The Key Concepts (Routledge Key Guides)

M.Sc. (Sports Nutrition) (Semester-I)  
(Credit Based Evaluation and Grading System)

***SNP410: BASICS OF NUTRITION AND DIET ANALYSIS PRACTICAL***

**L**      **T**      **P**  
**0**      **0**      **8**

1. Identification of different food stuffs, weight and measures and cooking terms.
2. Basic five food groups, dietary guidelines and food pyramid
3. Dietary Guidelines for normal individuals and special needs
4. Meal Planning and Preparation:  
Principles of meal planning
5. Use of Food Composition Tables.
6. Use of Food Exchange Lists.
7. Assessment of nutritional status of community by using dietary survey & anthropometric measurements.
8. Prepare following recipes and calculate their nutritive value.
  - a. Prepare 5 high protein and high energy recipes.
  - b. Prepare 5 high carbohydrate, moderate protein & low fat recipes.
  - c. Prepare 5 high fiber and low glycemic index recipes.
  - d. Prepare 5 low sodium, low fat and high fiber recipes
  - e. Prepare 5 iron rich recipes and calcium rich recipes.

M.Sc. (Sports Nutrition) (Semester-II)  
(Credit Based Evaluation and Grading System)

**SNL451: THERAPEUTIC NUTRITION**

**L**      **T**      **P**  
**4**      **0**      **2**

**Max Marks: 100**

**Mid Term: 20**

**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

**1. Therapeutic modification of the normal diet.**

Normal, soft and liquid diets and enteral feeding.

**2. Etiology, clinical and bio-chemical manifestation and dietary counselling for the following diseases:** Review of Gastro intestinal diseases.

- a. Peptic ulcer - gastric and duodenal ulcers.
- b. Diarrhoeas - acute and chronic.
- c. Constipation - atonic and spastic.
- d. Mal absorption syndromes – Carbohydrates, Lactose intolerance and fat intolerance sprue, celiac diseases.

**SECTION-B**

**1. Liver Diseases:**

- a. Infective Hepatitis, Cirrhosis.
- b. Gall bladder diseases.

**2. Diabetes: Juvenile and adult, onset, types.**

Type-I and Type-II diabetes mellitus, Gestational diabetes mellitus, Types of insulin and their action, Oral hypoglycemic drugs.

**SECTION-C**

**1. Cardiovascular disorders:** Hypertension, Atherosclerosis, coronary heart disease, Febrile conditions, acute and chronic.

**2. Joint pain and stiffness, gout, fractures**

**SECTION-D**

**1. Renal Disorders:**

Glomerulonephritis, Nephrotic syndrome, acute and chronic renal failure

**2. Nutrition and cancer.**

Nutrition in various stages of cancer, chemotherapy, role of antioxidants in cancer.

**3. Nutrition in surgery**

Bariatric surgery, ICU patients

**Practical:**

Assessment of causative factors and metabolic changes in various diseases/disorders

Dietary assessment in disease conditions

Planning of therapeutic diets based on patients needs for various diseases /disorders

M.Sc. (Sports Nutrition) (Semester-II)  
(Credit Based Evaluation and Grading System)

**References:**

1. Donald Stewart Maclaren, Mal–Nutrition and the Eye Academic Press, New York and London.
2. Williams and Wilkins Co, Diabetes Mellitus, U.S.A.
3. Mitchell, H.R., Comparative Nutrition of Man and Domestic Animals: Vol. II, Academic Press, New York and London.
4. Beport, L.J., Nutrition and Physical Fitness.
5. Mc. Durtt, Maxine, Human Nutrition.
6. Rajalakshmi, R., Applied Nutrition.
7. Dorothea, Turner, Hand Book of Diet Therapy.
8. Davidson, S., Passmore, R. Brock, J.F. and Truswell A. S., Human Nutrition and Dietetics.
9. Anita, F.P., Clinical Dietetics and Nutrition
10. Pyke, Maonus, Food Science and Technology.
11. Goodheart, R.S., Shills, Modern Nutrition Health and Disease, 1980.
12. Krause's, Food Nutrition and Diet Therapy, 10th Edition.

M.Sc. (Sports Nutrition) (Semester-II)  
(Credit Based Evaluation and Grading System)

**SNL452: DIETARY SUPPLEMENTS AND FUNCTIONAL FOODS**

**L**     **T**     **P**  
**4**     **0**     **0**

**Max Marks: 100**  
**Mid Term: 20**  
**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

- 1. Anti-doping regulations and harmful effects of use of steroids & other banned substances**
- 2. Dietary Supplements: Regulations and Classification**
  - a. Definition and regulations OF Dietary Supplements (country-specific)
  - b. Classification of Dietary/Nutritional Supplements

**SECTION-B**

- 1. Composition, Benefits and Applications of Nutritional Supplements Macronutrient Supplements:**
  - a. Pure proteins (e.g. Whey, Casein, Egg albumen, Soy protein, Pea protein & other vegan proteins/protein blends), Protein bars, Weight gainers; Amino acid supplements - Glutamine, Arginine
  - b. Carbohydrate supplements & EFAs, Glycerol
  - c. Meal replacement powders, Ready To Drink protein shakes (RTDs)
  - d. Sports drinks & Sports gels

**SECTION-C**

**Micronutrient Supplements:**

- a. Benefits/Mechanism of action and Applications
- b. Vitamins: Ergogenic role of B-complex vitamins, Vitamin B12 & folic acid, Vitamin D supplements, Multi-vitamin supplements
- c. Mineral supplements: Calcium-Magnesium-, Iron supplements, supplements, Electrolyte replacement drinks
- d. Antioxidant vitamins & mineral supplements

**SECTION-D**

- 1. Benefits/Mechanism of action and Applications of Herbal Supplements**
  - a. Ergogenic Herbal supplements:-Ashwagandha, Rhodiola, Shilajit, Ginseng, Grape seed extract,
  - b. Herbal Testosterone-boosters (e.g. Tribulus terrestris, Nettle root, Long jack root etc)
- 2. Functional foods/phytochemicals**
  - a. Green tea extract, Tart cherries, Caffeine, Curcumin, Phytosterols, Flavonoids, Beta-alanine, L-Carnitine

**References:**

1. Goldberg, I 1994. Functional Foods: Designer Foods, Pharma foods, Nutraceuticals Chapman & Hall
2. Gibson, GR and William, CM. 2000. Functional foods - Concept to Product. Woodhead Publishing.
3. Aluko, R.E. (2012). Functional Foods and Nutraceuticals. Springer

M.Sc. (Sports Nutrition) (Semester-II)  
(Credit Based Evaluation and Grading System)

**SNL453: WEIGHT MANAGEMENT, REHABILITATION AND FITNESS**

<b>L</b>	<b>T</b>	<b>P</b>
<b>4</b>	<b>0</b>	<b>0</b>

**Max Marks: 100**

**Mid Term: 20**

**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

**Adult and Childhood obesity**

- a. Prevalence, Types, etiology, Theories of obesity, Factors affecting, Comorbidity.
- b. Management through- Long term and short term measures, Nutrition, Exercise, pharmaceutical, Surgical, Stress Mgt. & Lifestyle modification.

**SECTION-B**

1. Regulation of energy intake and expenditure, control of appetite and food intake, Foods selection and consumption pattern
2. Hormonal control: Insulin, Thyroid & estrogen.

**SECTION-C**

1. Care and cure in rehabilitation, precaution.
2. Necessity of continuous monitoring and necessary emergency procedures.

**SECTION-D**

**Components of fitness –**

- a. Total Fitness (health related fitness) and Athletic fitness.
- b. Body Composition and types, Cardiorespiratory Fitness, Muscular endurance and power, Flexibility.
- c. Athletic Fitness- Balance, Coordination, Agility, reaction Time etc.

**Practical:**

Determination of energy intake and expenditure

Assessment of cardio respiratory fitness

Assessment of muscular fitness- Muscle strength, endurance and flexibility

**References**

1. Edward L. fox and Donald K Mathews (1985). CBS College Publishing. Japan
2. Present Knowledge in Nutrition; Ed, Myrtle L. Brown, ILSI Press.
3. David C. Nieman , Fitness and Sports Medicine, A Health related Approach ( 3<sup>rd</sup> edition, 1995
4. Bases of fitness- Edward L. fox , Timothy E. Kirby and Ann Roberts Fox (1987)
5. Measurement and evaluation for Physical Educators - Don Kirkendall, Joseph J Gruber and Robert E. Johnson. 1987. Human kinatics Publishers Inc.
6. The Physiological Basis of Physical Education and Athletics, by E.L.Fox and D.K.Mathews, Holt-Saunders, 1981.

M.Sc. (Sports Nutrition) (Semester-II)  
(Credit Based Evaluation and Grading System)

**SNL454: EXERCISE PHYSIOLOGY**

**L      T      P**  
**4      0      0**

**Max Marks: 100**

**Mid Term: 20**

**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

**Cardiovascular system and Exercise**

**Cardiovascular Aspects:**

1. Overview of the heart, blood vessels, and blood composition  
Heart size in the athlete & normal; difference in strength/power trained vs. endurance trained heart:  
Acute HR, BP, SV, a-v-O<sub>2</sub> diff, cardiac output, blood flow responses to exercise at various intensities; from rest to maximal.
2. Chronic adaptations to endurance exercise training; various modes of training with respect to: Heart rate, Blood pressure, Stroke volume, Cardiac output, a-v-O<sub>2</sub> difference,
3. Vascularization and exercise training
4. Blood pressure responses to exercise

**SECTION-B**

**Exercise and Respiratory system**

1. **The basics of Ventilation**
  - a) Pulmonary anatomy
  - b) Mechanics of ventilation
  - c) Static and dynamic lung volumes
  - d) Dead space and alveolar ventilation
  - e) Minute Ventilation
  - f) Acute and chronic responses to exercise
2. **Control and regulation of ventilation**
  - a) Neural-humoral mechanisms
  - b) Central inputs to the inspiratory center
  - c) Central Command from the motor cortex
  - d) Humoral & Peripheral input

**SECTION-C**

**Skeletal & Neuromuscular and Endocrine System**

1. **Skeletal muscle structure and contractile properties**
  - a) Types of skeletal muscle and how they are important in various sports activities b) Architectural properties
  - c) Neurons, motor unit recruitment and integrative control of movements d) Neurological Control of Movement
  - e) Neuromuscular Adaptations to Resistance Training
  - f) Size principle of motor unit recruitment g) Contractile properties
  - h) Types of contractions experimental models of muscle contraction i) Length-tension relationship
  - j) Force-velocity relationship

M.Sc. (Sports Nutrition) (Semester-II)  
(Credit Based Evaluation and Grading System)

2. **Training for muscle strength, endurance, and power**
  - a) Principles of skeletal muscle adaptations
  - b) Principles of endurance conditioning
  - c) Central and neuromuscular fatigue
  - d) Ergogenic aids that enhance muscle size and function
  - e) Muscle glycogen; super-compensation during / before athletic competition.
3. **The tissues of the human skeletal system**  
Joints Adaptive abilities and capacity of the skeletal system to exercise
4. **Acute effects of exercise training on hormone levels and hormone activity**  
Control and regulation mechanisms involved in hormone homeostasis during exercise Chronic effects of exercise training on hormone levels, especially the elite athlete Measurement of blood pressure, sweat rate during exercise

**SECTION-D**

**Applied Exercise Physiology**

1. Human energy metabolism during exercise  
Human energy systems and fatigue during exercise.
2. Training for aerobic and anaerobic power Training principles  
Anaerobic/ aerobic changes with training Factors affecting training response Exercising during pregnancy
3. Muscular strength  
Strength and Resistance training  
Structural and functional adaptations to resistance training Body composition and physical performance

**REFERENCES:**

**Textbooks:**

1. ACSM's *Guidelines for Exercise Testing and Prescription*, 8th ed., Lippincott Williams & Wilkins, Philadelphia, 2009.
2. Wilmore, J., Costill, D., and Kenney, W. *Physiology of Sport and Exercise*, 4th ed., Human Kinetics, 2008.
3. Brooks, G., Fahey, T., and Baldwin, K. *Exercise Physiology: Human Bioenergetics and Its Applications*, 4<sup>th</sup> ed. McGraw Hill
4. McArdle, W, Katch, F., and Katch, V. *Exercise Physiology: Energy, Nutrition, and Human Performance*, Lippincott Williams & Wilkins.
5. Astrand, P, et al. *Textbook of Work Physiology*, 4th ed., Human Kinetics, 2003.
6. Williams, *Nutrition for Health, Fitness and Sport*, 7<sup>th</sup> ed. Mc Graw Hill

**Peer-reviewed journals**

*Strength and Conditioning Journal*  
*Journal of Strength and Conditioning Research*  
*Medicine and Science in Sports and Exercise*  
*American Journal of Physiology*

**Online resources**

[www.acsm.org/](http://www.acsm.org/)  
[www.nscs-lift.org/](http://www.nscs-lift.org/)  
[www.the-aps.org/](http://www.the-aps.org/)  
[www.faseb.org](http://www.faseb.org)



M.Sc. (Sports Nutrition) (Semester-II)  
(Credit Based Evaluation and Grading System)

***SPL590: EVIDENCE BASED PRACTICE IN ALLIED HEALTH SCIENCES (ELECTIVE)***

**L      T      P**  
**3      0      0**

**Max Marks: 100**  
**Mid Term: 20**  
**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

1. Introduction to evidence– based complementary medicine
2. Evidence–based health care
3. Evidence–based practices
4. Evidence–based decision making and management

**SECTION-B**

1. Types of evidence
  - a. Definition of evidence
  - b. Forms of evidence
  - c. Randomized controlled trials

**SECTION-C**

1. Case–control studies
2. Cohort studies

**SECTION-D**

1. Applying the evidence
  - a. Pathways, guidelines and protocols
  - b. Future directions for clinical effectiveness
2. Evaluation of effectiveness and efficiency of the process

**References:**

1. Martin Dawes, Philip Davies, and Alistair Gray, Evidence–Based Practice: A Primer for Health Care Professionals. Elsevier Publication.
2. Albert R. Roberts and Kenneth R. Yeager, Evidence–Based Practice Manual: Research and Outcome Measures in Health and Human Services, Oxford University Press.
3. Allen Rubin, Practitioner's Guide to Using Research for Evidence–Based Practice. John Willey & Sons Publication.
4. Domhnall MacAuleyThomas M Best, Evidence–based Sports Medicine. BMJ Books.
5. Kathryn Refshauge and Elizabeth Gass, Musculoskeletal Physiotherapy: Its Clinical Science and Evidence–Based Practice. Churchill Livingstone.
6. Allen Rubin, Statistics for Evidence–Based Practice and Evaluation. Cengage learning.
7. Bernadette Melnyk, Ellen Fineout–Overholt, Evidence–Based Practice in Nursing and Healthcare: A Guide to Best Practice, Lippincott Williams & Wilkins.

M.Sc. (Sports Nutrition) (Semester-II)  
(Credit Based Evaluation and Grading System)

***SPL591: WOMEN HEALTH AND EXERCISE (ELECTIVE)***

**L      T      P**  
**3      0      0**

**Max Marks: 100**  
**Mid Term: 20**  
**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

1. Gender difference in muscle morphology
2. Diagnosis and Treatment of Urinary Incontinence and Prolapse

**SECTION-B**

1. Anemia
2. Hypertension in Women

**SECTION-C**

1. Bone health: assessment and treatment of osteopenia and osteoporosis
2. Evaluation and Treatment of Common Musculoskeletal Complaints

**SECTION-D**

1. Exercise for the childbearing year
2. Exercise for adolescence
3. Exercise for the older woman

**References:**

1. Nadya Swedan (2001): Women's Sports Medicine and Rehabilitation. An Aspen Publication.
2. Mary Lloyd Ireland & Aurelia Nattiv (2002): The Female Athlete. Saunders Publication.
3. Cardozo L and Staskin D (2006): Textbook of Female Urology and Urogynaecology (2nd edn). London: Isis Medical Media Ltd.
4. Mantle J, Haslam J and Barton S (2004): Physiotherapy in Obstetrics and Gynaecology. (2nd Ed.) London: Butterworth–Heinemann.
5. Sapsford R, Markwell S and Bullock–Saxton J (1998): Women's Health: A Textbook for Physiotherapists. London: WB Saunders Company Ltd.
6. Bo, K., Berghmans, L.C.M., Van Kampen, M., Morkved, S. (2007). Evidence–Based Physical Therapy for the Pelvic Floor: Bridging Science and Clinical Practice. London: Churchill Livingstone.

M.Sc. (Sports Nutrition) (Semester-III)  
(Credit Based Evaluation and Grading System)

**SNL501: NUTRITION FOR RESISTANCE AND POWER SPORTS**

**L**      **T**      **P**  
**4**      **0**      **0**

**Max Marks: 100**

**Mid Term: 20**

**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

**Nutrition for strength sport athletes**

- a. Types and characteristics of strength or high intensity sports (sprinting, throwing, body building etc)
- b. Physiology of energy systems,.
- c. Nutritional requirements- macronutrients- carbohydrates, fats proteins
- d. Muscle building- post exercise anabolic window
- e. Impact of resistance training on body composition of athletes in strength sports
- f. Micronutrient requirements
- g. Nutrient periodization in training and competition

**SECTION-B**

**Nutrition for weight class sports- combat sports, individual events**

- a. Types and characteristics- physiological needs, body composition and energy systems used.
- b. Macro and micronutrient requirements in training and competition.
- c. Hydration guidelines in weight class sports
- d. Making weight- weight loss and gain in training and competition-
- e. Strategies to promote healthy weight loss in athletes

**SECTION-C**

**Nutrition for racket sport athletes- badminton, squash, tennis**

- a. Characteristics- physiology, energy system, and body composition, duration of match, training.
- b. Macro and micronutrient requirements in training and competition
- c. Dietary and hydration strategies for athletes in different periods of training and competition

**SECTION-D**

**Use of Nutritional supplements in strength/power sports- use, effects, efficacy and safety**

- a. Creatine monohydrate, Sodium bicarbonates, Nitrates
- b. B-Alanine, Caffeine
- c. Protein supplements
- d. Fat burners

M.Sc. (Sports Nutrition) (Semester-III)  
(Credit Based Evaluation and Grading System)

**References:**

1. Manore, M., Meyer, N. L., & Thompson, J. (2009). *Sport nutrition for health and performance*. Human Kinetics.
2. 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.
3. Jeukendrup, A., & Gleeson, M. (2010). *Sport nutrition: an introduction to energy production and performance* (No. Ed. 2). Human Kinetics.
4. Seebohar, B. (2011). *Nutrition periodization for athletes: Taking traditional sports nutrition to the next level*. Bull Publishing Company.
5. 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.
6. 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.
7. McArdle, W. D., Katch, F. I., & Katch, V. L. (2009). *Sports and exercise nutrition*. Lippincott Williams & Wilkins.

M.Sc. (Sports Nutrition) (Semester-III)  
(Credit Based Evaluation and Grading System)

**SNL502: NUTRITION FOR TEAM SPORTS**

**L**      **T**      **P**  
**4**      **0**      **0**

**Max Marks: 100**  
**Mid Term: 20**  
**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

**Classification and physiology of field and court sports**

- a. Type and characteristics of team sports- field and court sports
- b. Physique, physiology, body composition and energy metabolism in team sports.

**SECTION-B**

**Macronutrient needs of team sport athletes according to training and position on the field.**

- a. Carbohydrate intake- pre, during and post event/training.
- b. Proteins and amino acids- type, amount and timing of ingestion
- c. Fat requirements.

**SECTION-C**

**Micronutrient requirements of team sport athletes**

- a. Role of vitamins and minerals in energy metabolism, blood formation, bone health, and antioxidants.
- b. Fluid and electrolyte requirements-Hydration strategies in athletes based on rules of the sport, available time and opportunities to hydrate on the field.

**SECTION-D**

**Practical nutrition guidelines for different team sport athletes**

- a. Field sports- hockey, football, rugby
- b. Batting sports- cricket, baseball, softball
- c. Court sports- volleyball, basketball, netball.
- d. Indian team sports- kabaddi, kho-kho

**References:**

1. Rankin J W, Nutrition for very high intensity sports in Sports Nutrition: A Practice manual for professionals edited by Marie Dunford 2006
2. 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
3. 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.

M.Sc. (Sports Nutrition) (Semester-III)  
(Credit Based Evaluation and Grading System)

**SNL503: DIETARY PLANNING FOR TEAM SPORTS, POWER AND ENDURANCE  
SPORTS**

**L      T      P**  
**4      0      2**

**Max Marks: 100**  
**Mid Term: 20**  
**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

**1. Planning and preparation of diets for**

- a. Sprinting
- b. Throwing
- c. High jump and long jump
- d. Gymnastics

**SECTION-B**

**2. Planning and preparation of diets for Weight class sports**

- a. Boxing
- b. Wrestling
- c. Weightlifting
- d. Body building

**SECTION-C**

**3. Planning and preparation of diets for Racket sport athletes**

- a. Badminton
- b. Squash
- c. Tennis/Table-tennis

**SECTION-D**

**3. Planning and preparation of diets for team sports**

- a. Cricket
- b. Hockey
- c. Football
- d. Kabbadi
- e. Basketball

**Practical:**

Assessment of characteristics, physiology and body composition needs of different sports  
Planning and preparation of diet of sports persons of various sports

**References:**

1. 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.
2. 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.
3. 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
4. McArdle, W. D., Katch, F. I., & Katch, V. L. (2009). *Sports and exercise nutrition*. Lippincott Williams & Wilkins.
5. Jeukendrup, A., & Gleeson, M. (2010). *Sport nutrition: an introduction to energy production and performance* (No. Ed. 2). Human Kinetics.

M.Sc. (Sports Nutrition) (Semester-III)  
(Credit Based Evaluation and Grading System)

***SYL501: EXERCISE TESTING FOR HEALTH- AND SKILL-RELATED COMPONENTS  
OF FITNESS***

<b>L</b>	<b>T</b>	<b>P</b>
<b>4</b>	<b>0</b>	<b>2</b>

**Max Marks: 100**  
**Mid Term: 20**  
**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

**Pre-test considerations**

1. Benefits associated with physical activity
  - Physical activity and fitness terminology
  - Public health perspective for current recommendations
  - Benefits of regular physical activity
  - Exercise dose response relationship
2. Risks associated with physical activity
  - Sudden death among young individuals and athletes
  - Exercise events in those with sickle cell trait
  - Exercise-related cardiac events in adults
  - Safety considerations
  - Risks associated with exercise testing
3. Pre-participation screening algorithm
  - Risk stratification and medical clearance
  - Pre-exercise test evaluations
  - Baseline measurements
  - Calculation of HR MAX and 85% HR max depending on protocol
  - Additional preparticipation assessments
  - Exercise testing and testing supervision recommendations
  - Population considerations
  - Children, elderly, apparently healthy, etc.
4. Test Order
  - Equations used to estimate aerobic power from TM protocols
  - Cycle ergometer protocols (arm and leg)
  - Equations used to estimate aerobic power from cycle ergometer protocols
  - ACSM guidelines for when to stop a test
  - Calculations used to estimate aerobic power from other variables

M.Sc. (Sports Nutrition) (Semester-III)  
(Credit Based Evaluation and Grading System)

**SECTION-B**

**Test protocols used for measuring the health- and skill-related components of fitness**

1. CV endurance field tests
  - VO2max testing
  - Norm tables
  - Maximal vs submaximal tests
  - Modes of testing
2. Muscular strength, endurance, and flexibility
3. Body composition
4. Balance, agility, coordination, reaction time, and anaerobic power

**SECTION-C**

**Exercise testing modifications for cardiac patients**

1. Pre-participation screening and risk stratification
  - Medical history
  - Medical clearance
  - Physician approval for testing
  - Risk factor identification
  - Medical emergency equipment
  - Risks of cardiac events during exercise testing
2. Diagnostic exercise testing
  - Exercise testing for disease severity and prognosis
  - Functional exercise testing
  - Measurements during exercise testing
  - Exercise testing after an MI
  - Exercise testing protocols, modalities, and testing supervision recommendations
  - Exercise testing for return to work
  - Indications for stopping a test
  - Post-exercise period
  - Cognitive skills required to competently supervise exercise tests
  - Exercise testing with imaging modalities
    - Exercise echocardiography
    - Exercise nuclear imaging
    - Pharmacologic stress testing
    - Electron beam computed tomography
  - Interpretation of clinical exercise test data



M.Sc. (Sports Nutrition) (Semester-III)  
(Credit Based Evaluation and Grading System)

**SECTION-D**

1. Risk stratification for cardiac patients
  - Inpatient rehabilitation programs
  - Clinical indications and contraindications for inpatient and outpatient cardiac rehabilitation
  - Outpatient exercise programs
  - Recommendations for supervision and monitoring of exercise
  - Signs and symptoms below which an upper limit for exercise intensity should be set
  - FITT principle and progression of exercise for the cardiac patient
  - Guidelines for exercise prescription for cardiac patients without an entry exercise stress test
  - Benefits of endurance exercise training in cardiac patients
  - Benefits of resistance training for cardiac patients
  - Risks of cardiac events during cardiac rehabilitation
  - Prevention of exercise-related cardiac events
  - Exercise training for return to work
  - Special cardiac patient populations
2. Myocardial ischemia
  - Congestive heart failure
  - Pacemakers and implantable cardioverter defibrillators
  - Cardiac transplant recipient
  - Coronary bypass graft and percutaneous transluminal coronary intervention

**Practical:**

Assessment of oxygen consumption using different platforms

ECG Interpretation

**References:**

1. Heyward, Vivian. Advanced Fitness Assessment and Exercise Prescription, 5 th ed., Human Kinetics, 2006.
2. ACSM's Guidelines for Exercise Testing and Prescription, 8th ed., Lippincott Williams and Wilkins, 2009.
3. Ed. Durstine and Moore. ACSM's Exercise Management for Persons with Chronic Diseases and Disabilities, 2nd ed. Human Kinetics, 2003
4. ACSM's Health-Related Physical Fitness Assessment Manual, 3rd ed, 2009.

M.Sc. (Sports Nutrition) (Semester-IV)  
(Credit Based Evaluation and Grading System)

**SYL551: SPORTS PSYCHOLOGY**

**L      T      P**  
**4      0      0**

**Max Marks: 100**

**Mid Term: 20**

**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

1. **History and current status of Sports Psychology.**
2. **Personality Assessment and sports personality.**
  - a. Theories of personality
  - b. Personality assessment
3. **Attention and perception in sports.**
  - a. Attention
  - b. Perception
4. **Concentration training in sports.**
  - a. Basic principles of concentration
  - b. Concentration training
  - c. Concentration awareness exercises
5. **Motivational orientation in sports.**
  - a. Athlete's needs of motivation
  - b. Motivational inhibitors
  - c. Motivational techniques

**SECTION-B**

1. **1. Pre-competitive anxiety.**
  - a. Source of PCA
  - b. Effect of PCA on performance
2. **Relaxation Training.**
  - a. Definition
  - b. Types of relaxation trainings
    - i) Progressive muscle relaxation
    - ii) Breathing exercises
    - iii) Yognidra
    - iv) Transcendental meditation
3. **Aggression in sports.**
  - a. Theories of aggression
  - b. Management of aggression
4. **Role of Psychology in Dealing with injuries.**
5. **Eating disorders.**
  - a. Etiology of eating disorders
  - b. Types of eating disorders
  - c. Complications of eating disorders
6. **Goal setting** i) Principles and ii) strategies

M.Sc. (Sports Nutrition) (Semester-IV)  
(Credit Based Evaluation and Grading System)

**SECTION-C**

**Doping and stress management**

1. Psychological aspect of doping
2. Psychological preparation of elite athletes a. Concept of psychological preparation
3. Biofeedback training
4. Mental imagery
5. Stress management
  - a. Principles of Stress Management b. Stress Management techniques

**SECTION-D**

1. Group Behaviour and leadership
  - a. Nature of group behaviour and group.
  - b. Types of group.
  - c. Educational implication of group behaviour.
  - d. Meaning of leadership, types of leadership quality of leadership, training and functioning of leadership.
2. Emotion
  - a. Meaning of emotion.
  - b. Characteristics of emotion.
  - c. Meaning of controlling and training of emotions and its importance.
  - d. Contribution of sports to emotional health.
  - e. Meaning of sentiment, its type, importance and formation.

**References**

1. Sports Psychology by Yadvinder Singh  
Publisher: Sports Publications
2. Sports Psychology Basics by Andrew Caruso  
Publisher: Reeds wain
3. Key Concepts In Sports Psychology by Ellis Cashmore  
Publisher: routledge fondation
4. A Comparative Study Of Sports Psychology by Dharmendra P Bhatt  
Publisher: Sports Publications
5. Basic Aspect Of Sport Psychology by D C Lal  
Publisher: Sports Publications
6. Essential Sport Psychology by Murphy Shane  
Publisher: Human Kine
7. Doing Sport Psychology by Andersen Mark  
Publisher: Human Kine
8. Sport Psychology: Contemporary Themes by Lavallee David  
Publisher: Palgrave M
9. Sport Psychology Interventions by Murphy Shane M  
Publisher: Human Kine
10. Sport Psychology (with Infotrac) by Arnold D Leunes  
Publisher: Wadsworth Publishing Company
11. Coaches Guide To Sport Psychology by Rainer Martens  
Publisher: Human Kinetics Publishers

M.Sc. (Sports Nutrition) (Semester-IV)  
(Credit Based Evaluation and Grading System)

***SNL551: DIET PLANNING FOR SPECIAL GROUPS***

**L      T      P**  
**4      0      6**

**Max Marks: 100**  
**Mid Term: 20**  
**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

- 1. Nutritional concerns of travelling and vegan athletes**
- 2. Athletes performing under altered climatic conditions**
  - a. High altitude
  - b. Mountaineers
  - c. High and low climatic temperature etc.
- 3. Nutrition guidelines for athletes with physical disabilities**

**SECTION-B**

**Management of selected nutritional problems among sportsperson**

- a. Anaemia** - causes, consequences and role of nutrition in the prevention and management
- b. Osteoporosis** - Bone Physiology, Effect of Nutrition, age, sex and exercise on bone health, Preventive and curative strategies of osteoporosis

**SECTION-C**

- 1. Nutritional management of Exercise Injuries**
- 2. Nutrition for Weight Management in Sports and Non-Sports Persons of Various Age Groups / Categories.**
  - a. Eating Disorders among sports persons, Types of Sports with weight restrictions
  - b. Need for Weight Loss & weight gain, Negative aspects of weight loss and recovery strategies
  - c. Dietary & Lifestyle Approaches for weight and fat loss and/gain

**SECTION-D**

- 1. Nutritional Management of clinical conditions among sports**
  - a. Diabetes mellitus
  - b. Hypertension, atherosclerosis
  - c. Gastro intestinal diseases-Peptic Ulcer, GI disturbance due to anxiety, Celiac disease, IBS

M.Sc. (Sports Nutrition) (Semester-IV)  
(Credit Based Evaluation and Grading System)

**Practical:**

Nutritional assessment and management of various therapeutic conditions in sports persons  
Nutritional counselling for athletes with physical disabilities  
Assessment of special nutritional concerns of travelling athlete and vegetarian athlete  
Weight gain/ weight loss management

**References:**

1. Bernadot, Dan (1999) Nutrition for serious Athletes, Human Kinetics USA.
2. Browns, Fred and Caustan, Cargill (2002) Essentials of Sports Nutrition – 2nd edition  
John Wiley and Sons,
3. Burke, L. Y.and Deking, V. (2006) Clinical Sports Nutrition (3rd ed.), Tata McGraw Hill  
Pub. England.
4. Summerfield, Lianne, M. (2001) Nutrition Exercise and Behaviour An integrated  
approach to weight
5. Wolinsky, I. (1998) Nutrition in Exercise and Sports CRC press NY.
6. Wolinsky, Ira and Driskell, J. (2004) Nutritional Ergogenic aids, CRC Press NY.

M.Sc. (Sports Nutrition) (Semester-IV)  
(Credit Based Evaluation and Grading System)

**SNL553: FOOD HYGIENE AND MANAGEMENT**

**L      T      P**  
**4      0      0**

**Max Marks: 100**  
**Mid Term: 20**  
**Major Exam: 80**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**SECTION-A**

**1. Characteristics of food**

Types of food; What is quality? Quantitative aspects of quality

Sensory quality

Nutritional quality

Foods recommended for use in lunchrooms and kiosks

**2. Food Purchasing**

Food Buyer

Purchasing activity

Buying food

**3. Receiving and Storage of Food**

Receiving

Storage

**SECTION-B**

**1. Menu Planning**

Why plan menus?

Planning menus

Writing menus

Types of menus

Construction of menus

Menu display

**SECTION-C**

**2. Food production**

Food production system

Food production process

Effect of preparation and cooking methods on the nutritional quality of foods

Some large quantity cooking techniques

Effective use of leftovers

Holding techniques

M.Sc. (Sports Nutrition) (Semester-IV)  
(Credit Based Evaluation and Grading System)

**SECTION-D**

**1. Hygiene and Sanitation**

Environmental hygiene and sanitation

Hygiene in food handling

Personnel hygiene

**2. Food Adulteration**

Types of adulterants

Intentional adulterants

Incidental adulterants

Food laws

Food standardisation and regulation agencies in India

International standards

**References**

1. Mohini Sethi, Surjeet Malhan, Catering Management An Integrated Approach, New Age international (P) limited, New Delhi.
2. Srilakshmi B.: Nutrition science, New Age International Publishers, New Delhi; 2<sup>nd</sup> Edition 2006.