

FACULTY OF SPORTS MEDICINE & PHYSIOTHERAPY

SYLLABUS

FOR

POST GRADUATE DIPLOMA IN NUTRITION AND FITNESS

(Semester: I – II)

Session: 2019-20



GURU NANAK DEV UNIVERSITY AMRITSAR

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Post Graduate Diploma in Nutrition and Fitness
(Under credit based continuous evaluation grading system)

Duration: 1 year

Semester-I:

Course No.	C/E/I	Course Title	L	T	P	Total Credits	Marks (Mid Semester + Major Exam)
Core courses							
NFL101	C	Human Nutrition and Metabolism	4	0	0	4	20+80:100
NFL102	C	Human Physiology	4	0	0	4	20+80:100
NFL103	C	Exercise Physiology	4	0	0	4	20+80:100
NFL104	C	Nutrition Assessment	4	0	0	4	20+80:100
NFL105	C	Nutrition Through Lifecycle	4	0	0	4	20+80:100
NFP112	C	Basics of Nutrition and Diet Analysis Practical	0	0	8	4	300
NFE113	C	Clinical Training	0	0	8	4	* C.F.
Total			16	0	16	28	

* C.F. (carried forward to 2nd semester)

Semester-II:

Course No.	C/E/I	Course Title	L	T	P	Total Credits	Marks (Mid Semester + Major Exam)
NFL151	C	Therapeutic Nutrition	4	0	4	6	20+80:100
NFL152	C	Weight management, Rehabilitation and Fitness	4	0	2	5	20+80:100
NFL153	C	Sports Nutrition	4	0	4	6	20+80:100
NFL154	C	Dietary Supplements and Functional Foods	4	0	0	4	20+80:100
NFE162	C	Clinical Training	0	0	10	5	*300
Elective Course (3 Credits)							
	E	Elective Course/Optional Course	3	0	0	3	20+80:100
Total			16	0	20	29	

*Total marks from I to II semesters

***List of Elective Courses:**

1. Evidence Based Practice in Allied Health Sciences - SPL690
2. Women Health and Exercise - SPL691

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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 2nd semester which includes all the practical work during the entire course of two 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 and to the coverage of various tournaments as and when required and decided by BOC.

* The credits earned by a candidate in practical and dissertation during different semesters will be evaluated at the end of the 2nd 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.

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NFL101: HUMAN NUTRITION AND METABOLISM

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

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

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

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

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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

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 Technology, 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. Ramasastri and S.C. Balasubramanian (1989)- Nutritive Value of Indian Foods. NIN ICMR Hyderabad 500 007

Post Graduate Diploma in Nutrition and Fitness (Semester-I)
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NFL102: HUMAN PHYSIOLOGY

L	T	P
4	0	0

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

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

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 O₂ and CO₂
3. **Excretory system** - anatomy, function, renal circulation, auto regulation of the circulation, Structural and functional unit, Urine formation.

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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,

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NFL103: EXERCISE PHYSIOLOGY

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

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

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

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-O₂ 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-O₂ 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

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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
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

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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*, 4th 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*, 7th 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/

www.nasca-lift.org/

www.the-aps.org/

www.faseb.org

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NFL104: NUTRITION ASSESSMENT

L T P
4 0 0

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

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

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

Introduction of nutritional status assessment methods- Anthropometry

1. Concept, methods, advantages, disadvantages and interpretation.: weight, height, BMI, MUAC, SFT, Waist/hip ratio, Z-scores, classifications – Gomez, Waterlow, IAP etc.
2. Various standards for reference for different age groups – WHO 2007 and others
3. Use of growth charts for boys and girls based on WHO 2007
4. Growth monitoring (GM) – importance of GM for growth promotion and nutritional rehabilitation

SECTION-B

Assessment of Dietary Intakes: Methods, Interpretations, Advantages and Disadvantages

1. 24 hour diet survey.
2. Food frequency method.
3. Weighed food inventory
4. Concept and use of consumption unit in diet surveys (e.g. NNMB).
5. Market surveys.
6. Food diaries and others

SECTION-C

Biochemical Indicators

1. Various biochemical parameters for assessing changes in the level of nutrients and their metabolites in body tissues at different levels of nutrition, their interpretation, advantages and disadvantages
2. Clinical signs and Symptoms for:
PEM, Anemia, Vitamin deficiencies, Mineral deficiencies

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SECTION-D

Biophysical Assessment

1. BP
2. Body Fat
3. Physical Work Capacity
4. Physical Activity Pattern

REFERENCES:

1. Jelliffe DB, Jelliffe EP (1989) Community nutritional assessment. Oxford University Press, New Delhi.
2. Gopaldas T and Seshadri S (1987) Nutrition monitoring and assessment. Oxford University Press. Delhi
3. Sachdev HPS, Choudhury P (Eds)., (1994) Nutrition in children. Developing country concerns. Dept of Pediatrics. Maulana Azad College. New Delhi
4. ICMR (2009) Recommended dietary intakes for Indians. Draft report ICMR, New Delhi.
5. Bruce Cogill – Anthropometric Indicators Measurement Guide, FANTA (USAID), AED, Washington, 2003
6. Gopalan C, Rama Sastri BV and Balasubramanian SC (1993)
7. Revised and updated by Narasinga Rao BS, Deosthale YG and Paul KC, Nutritive Value of Indian Foods, Hyderabad: National Institute of Nutrition, Indian Council of Medical Research

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NFL105: NUTRITION THROUGH LIFECYCLE

L T P
4 0 0

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

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

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SECTION-A

Definition of Health and Nutrition and Factors influencing food Intake

1. Growth and development; Major milestones.
2. Environmental and Household factors influencing the food intake in life cycle.
3. Psycho – emotional influences on food intake and nutritional status

SECTION-B

Food groups, exchange system, RDA, Concept of Meal Planning

1. The five food groups – importance, Nutrients provided by each group, sources and functions
2. Energy requirements and basis of setting energy requirements.
3. Recommended dietary allowances for all nutrients.
4. Food Pyramid, balanced diet, food based dietary guidelines (NIN, ICMR)
5. Exchanges of foods and amounts – Use of weights and measures (IFCT, 2017)
6. Importance of meal planning and factors affecting meal planning.

SECTION-C

Nutrition through Lifecycle- Pregnancy and Lactation

1. Stages in fetal growth and development.
2. Effect of pre-pregnancy and pregnancy nutritional status on the fetus (fetal origins of adult diseases) and pregnancy outcome (SFD, IUGR babies).
3. Pregnancy – weight gain during pregnancy (according to BMI), nutritional requirements in the three trimesters, food and nutrient intake by pregnant women in various socioeconomic groups.
4. Lactation - composition of breast milk and advantages of breast feeding to infant and mother, exclusive breast feeding 0-6 months, Nutritional requirements during Lactation.
5. Special considerations for meal planning in pregnancy and lactation in all income groups, food taboos.

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SECTION-D

Nutrition through Lifecycle- Infancy to Geriatrics

1. Nutrition and growth during infancy and preschool years - nutritional requirements of infants and preschool children, recommended breast feeding and complementary feeding practices.
2. Planning for safe and nutritious complementary and indigenous foods: low and high income groups.
3. Nutrition and growth of school children and adolescents - Growth and development in school age and adolescence, nutritional requirements of 6-10 and 11-19 years old, special nutritional problems of school children and adolescents in the low income group.
4. Geriatric nutrition – Ageing and nutritional needs recommended dietary allowances, special considerations in planning meals for the geriatric group, special care of old people.

REFERENCES:

1. Gopalan C, Rama Sastri BV and Balasubramanian SC (1993) Revised and updated by Narasinga Rao BS, Deosthale YG and Paul KC, Nutritive Value of Indian Foods, Hyderabad: National Institute of Nutrition, Indian Council of Medical Research.
2. Sheel Sharma (2000) Human Nutrition and Meal Planning, Published by Mrs. S Chowdhary for Jnanada Prakashan (P&D) (JNANADA), 24, Daryaganj, N.Delhi.
3. Krause, M.V. and Mahan, L.K. (1986) Food, Nutrition and Diet Therapy, Alian R. Liss, Saunders Co., London.
4. Passmore, R. and Davidson, S. (1986) Human Nutrition and Dietetics, Livingstone Publishers
5. Robinson, C.H., Laer, M.R., Chenoweth, W.L., Garwick, A.E. (1986) Normal and Therapeutic Nutrition, Macmillan Publishing Company, New York.
6. Williams, S.R. (1989) Nutrition and Diet Therapy, 4th Ed., C.V. Mosby Co.
7. Shils, M.E., Olson, J.A., Shike, M.Eds. (1994)
8. Modern Nutrition in Health and Disease, 8th Edn., Lea and Febiger A Waverly Company.

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NFP112: BASICS OF NUTRITION AND DIET ANALYSIS PRACTICAL

L	T	P
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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.

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NFL151: THERAPEUTIC NUTRITION

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

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

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

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-2 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

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SECTION-D

1. Renal Disorders:

Glomerulonephritis, Nephrotic syndrome, acute and chronic renal failure, dialysis (peritoneal and hemodialysis),

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

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. Bepert, L.J., Nutrition and Physical Fitness.
5. Mc. Durt, 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

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NFL152: WEIGHT MANAGEMENT, REHABILITATION AND FITNESS

L T P
4 0 2

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

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

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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.

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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 (3rd 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.

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NFL153: SPORTS NUTRITION

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

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

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

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 different sports

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

SECTION-B

Role and Significance of Macronutrients in Sports

- a. Carbohydrate intake- pre, during and post event/training.
Carbohydrate Metabolism
Carbohydrate Reserves
Factors affecting utilization of carbohydrates during exercise
- b. Proteins and amino acids- type, amount and timing of ingestion
Amino acid metabolism during exercise
Protein turnover and exercise
Protein intake and performance
- c. Fat requirements.
Fat as a fuel
Fatty acid oxidation

SECTION-C

Micronutrient requirements of 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.

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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
- f. Racket sports- tennis, table tennis, badminton

References:

1. Rankin J W, Nutrition for very high intensity sports in Sports Nutrition: A Practice manual for professionals edited by Marie Dunford 2006
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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.
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6. Jeukendrup, A., & Gleeson, M. (2010). *Sport nutrition: an introduction to energy production and performance* (No. Ed. 2). Human Kinetics.
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NFL154: DIETARY SUPPLEMENTS AND FUNCTIONAL FOODS

L T P
4 0 0

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

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

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

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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

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SPL690: EVIDENCE BASED PRACTICE IN ALLIED HEALTH SCIENCES (ELECTIVE)

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

Max Marks: 100

Mid Term: 20

Major Exam: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

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

Types of evidence

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

SECTION-C

- a. Case-control studies
- b. 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

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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.

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SPL691: WOMEN HEALTH AND EXERCISE (ELECTIVE)

L T P
3 0 0

Max Marks: 100

Mid Term: 20

Major Exam: 80

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

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
3. Anemia

SECTION-B

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

SECTION-C

1. Exercise for the childbearing year
2. Exercise for adolescence
3. Perimenopausal and post menopausal

SECTION-D

1. Exercise in Athletic Women
2. Medical Problems in Sports Women

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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.