

AC _____
Item No. _____

UNIVERSITY OF MUMBAI



Syllabus for Approval

Sr. No.	Heading	Particulars
1	Title of the Course	M. Sc. (Home Science) Branch IA: Foods, Nutrition and Dietetics Semester III and IV
2	Eligibility for Admission	<ul style="list-style-type: none"> • Bachelor of Home Science (general or any specialization) • B.Sc. with Microbiology / Biochemistry / Life Sciences /Biotechnology and Combinations • P.G.Diploma in Dietetics and Applied Nutrition/Clinical Nutrition • B.Sc. Human Science • Minimum 60% (Open), 60% (Christian Minority), 55% (OBC/SC/ST/DT/NT each) at TYBSc. Qualifying examination • Learners of any gender are eligible to apply for admission to the course. • As the course is interdisciplinary , admission criteria will be based on merit cum qualifying entrance examination as per circular No/ICC/2014-15/13/II-K_pg2of4
3	Passing Marks	40% (Theory) and (Practical)
4	Ordinances / Regulations (if any)	Eligibility- O.5088 from circular dated 10th December, 2015 Attendance- O. 6086 with effect from 2014-15 and thereafter
5	No. of Years / Semesters	1 years/ 2 Semesters
6	Level	P.G. / U.G./Diploma / Certificate (Strike out which is not applicable)
7	Pattern	Yearly/ Semester (Strike out which is not applicable)
8	Status	New/ Revised (Strike out which is not applicable)
9	To be implemented from Academic Year	From Academic Year <u>2017-18</u>

Date: 17.04.2017

Signature :

Name of BOS Chairperson / Dean : Dr Geeta Ibrahim

UNIVERSITY OF MUMBAI



Essentials Elements of the Syllabus

1	Title of the Course	M. Sc. (Home Science) Branch IA: Foods, Nutrition and Dietetics Semester III and IV
2	Course Code	PSHSIA
3	Preamble / Scope	The Masters in Home Science specializing in Foods, Nutrition and Dietetics is designed to impart advanced knowledge and skills that is life oriented, career and community oriented. It has special relevance to industry and hospital application with the help of weekly field work, rural camp and hospital/industry internship programme.
	Objective of Course / Course Outcome	<ul style="list-style-type: none">• To equip students to plan diets for clinical and therapeutic conditions within a hospital, fitness centre or gym setting.• To impart students a systematic approach to basic and applied aspects of food processing and technology.• To familiarize students with the various theoretical and practical aspects of food quality and its control.• To provide students with an opportunity to conduct independent research.
4		Eligibility <ul style="list-style-type: none">• Bachelor of Home Science (general or any specialization)• B.Sc. with Microbiology / Biochemistry / Life Sciences /Biotechnology and Combinations• P.G.Diploma in Dietetics and Applied Nutrition/Clinical Nutrition• B.Sc. Human Science• Minimum 60% (Open), 60% (Christian Minority), 55% (OBC/SC/ST/DT/NT each) at TYBSc. Qualifying examination• Learners of any gender are eligible to apply for admission to the course.• As the course is interdisciplinary , admission criteria will be based on merit cum qualifying entrance examination as per circular No/ICC/2014-15/13/II-K_pg2of4

Fee Structure

**M.Sc. (HOME SCIENCE) DEGREE COURSE IN
BRANCH IA : FOODS, NUTRITION AND DIETETICS
SEMESTER III & IV**

PROPOSED FEE STRUCTURE 2017-18

No.	*Particulars of fees for M.Sc. (Home Science) Semester III and IV	Amount
1	Tuition fee	460.00
2	Univ. Share Tuition fee	540.00
3	Form and Prospectus fee	0.00
4	Other fees/ Extra curricular activities	250.00
5	Exam fee	3120.00
6	Laboratory fee	6000.00
7	Library	1000.00
8	Gymkhana	400.00
9	Admission processing fee	0.00
10	V.C. Fund	20.00
11	Magazine	100.00
12	Identity Card	50.00
13	Group insurance	40.00
14	Student Welfare	50.00
15	University Sports and cultural activity	30.00
16	Development fee	500.00
17	Utility	250.00
18	Computer/Laptop	500.00
19	e suvidha	50.00
20	e charges	20.00
21	Disaster relief fund	10.00
22	Convocation fee only for M.Sc Part II	250.00
23	National Services Scheme	10.00
24	Field trips/Activities	1000.00
	TOTAL	14650.00

*** FEES ARE DUE TO BE REVISED**

7	No. of Lectures	16 periods per week
8	No. of Practical	14 periods per week
9	Duration of the Course	1 year
10	Notional hours	10 periods per week
11	No. of Students per Batch: 10 – 12	
12	Selection- Merit at qualifying T.Y.B.Sc. examination (Semester V and VI) and Entrance	
13	Examination	
14	Assessment – included in the syllabus copy as Scheme of Examination	
15	Syllabus Details – included in the syllabus copy	
16	Title of the Unit – included in the syllabus copy	
17	Title of the Sub-Unit – included in the syllabus copy	

18	Semester wise Theory – included in the syllabus grid
19	Semester wise List of Practical – included in the syllabus grid
20	Question Paper Pattern – included in the syllabus copy as Scheme of Examination
21	Pattern of Practical Exam – included in the syllabus copy as Scheme of Examination
22	Scheme of Evaluation of Project / Internship- – included in the syllabus copy
23	List of Suggested Reading – included in the syllabus copy
24	List of Websites – included in the syllabus copy wherever applicable
25	List of You-Tube Videos –Not Applicable
	List of MOOCs –Not Applicable

M.Sc. (Home Science)

Branch I A : Foods, Nutrition & Dietetics

Semester III

(Revised w.e.f. June 2017)

Sub Code	Title	Internal Assessment Marks	Semester End Marks	Total Marks	Periods/ Week/ Batch/ Division	Credits
PSHSIA301	Advances in Human Nutrition - I	40	60	100	4	4
PSHSIA302	Clinical Nutrition and Therapeutic Dietetics	40	60	100	4	4
PSHSIA303	Nutritional Epidemiology	40	60	100	4	4
PSHSIA304	Nutrition for Exercise and fitness	40	60	100	4	4
PSHSIAP301	Dissertation	50	50	100	10	4
PSHSIAP302	Therapeutic Dietetics– I	-	50	50	4	2
PSHSIAP303	Internship	-	50	50	-	2
	Total			600	30	24

Course Code	Title	Periods/Week/Division	Marks	Credits
PSHSIA301	Advances In Human Nutrition	4	100	4

Objectives:

To enable students to

1. Get an insight into the role of Nutrition in growth and development.
2. Understand the importance of nutrition in maintaining optimum body composition
3. Understand the need for special nutritional considerations in altered climatic conditions
4. To update students on the recent advances in Human Nutrition

Units	Course Content	Periods
Unit I	<p>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 and Mental Growth and Development</p> <p>B. Human Body composition: Models of body composition, Changes in body composition through life cycle and factors influencing.</p> <p>C: Assessment of body composition using Anthropometry, bio electrical impedance, DEXA, Doubly labeled water (DLW) technique etc.,- Applications, Principles, Protocol, prediction equations, interpretation, Advantages & Disadvantages</p> <p>D: Concept of dietary nutrient recommendations: RDAs,DRI, TUL etc.</p>	15
Unit II	<p>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</p> <p>B: Carbohydrates: Over view of Classification, Functions, digestion and absorption.</p> <p>Recent advances in</p> <ol style="list-style-type: none"> 1. Carbohydrate recommendations 2. Glycemic Index and Glycemic Load-Applications in the diet, 3. Dietary fiber and Resistant starch-Types, Health benefits and 4. Sugar substitutes-Nutritive and non -nutritive sweeteners- Synthetic and Natural sweeteners 	15
Unit III	<p>A: Fats and Fatty acids: Over view of Classification, Functions, digestion and absorption; and Recent advances in</p> <ol style="list-style-type: none"> a. RDAs of total dietary fat and fatty acid consumption; Fatty acid ratios b. Role of total fat intake, SFA, MUFA & PUFAs in health & disease c. Oil blends <p>B: Proteins and Amino acids- Over view of Classification, Functions, digestion and absorption;</p> <ol style="list-style-type: none"> 1. Essential Amino acid requirements and AA imbalances 2. Assessment of quality of Food protein-Biological and chemical methods, 3. Assessment of protein nutritional status: Anthropometry, BIA <p>-Tracer techniques, -Recommended Dietary Allowances of protein and amino acids for various groups of population -Concerns of RDAs for vulnerable groups of population</p>	15

References

- Shils, M.E., Olson, J., Shike, M. and Roos, C (2003). Modern Nutrition in Health and Disease, 9th 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.

Course Code	Title	Periods/Week/Division	Marks	Credits
PSHSIA302	Clinical Nutrition and Therapeutic Dietetics	4	100	4

Objectives

1. To expose students to the nutritional care process, the role of a nutritionist and the methods employed in nutrition provision and intervention.
2. To impart knowledge regarding prevalence, etiology, diagnosis, pathophysiology, drug nutrient interactions, gene – nutrient interactions and medical, nutritional and lifestyle management in different disease conditions.
3. To enable students to understand advances in clinical nutrition, emerging modes of therapy and intervention and ongoing research in the field.
4. To emphasize the role of nutrition in the prevention of chronic disease.
5. All diseases (acute and chronic) will be discussed with reference to the following topics:-
6. Etiology, risk factors, Diagnosis, classification, Pathophysiology.
7. Management –
 - Nutritional
 - Lifestyle and exercise
 - An overview of Medical, surgical and other interventions(whenever applicable)
8. Drug – nutrient and Gene- nutrient interactions
9. Advances and trends in research in the disease conditions.
10. Available supplements and nutraceuticals

Unit	Course Content	Periods
Unit I	Disorders of the Gastro Intestinal system <ul style="list-style-type: none"> • Dental issues • GERD and esophagitis • Gastroparesis • Gastritis • Peptic Ulcers • Intestinal symptoms – overview • Gluten Induced Enteropathy • Lactose intolerance • Inflammatory bowel Disease • Short Bowel Syndrome • Small intestinal Bacterial Overgrowth and Dysbiosis. • Irritable Bowel Syndrome • Diverticulitis and Haemorrhoids 	15
Unit II	Diseases of the Liver, Pancreas and Gall bladder <p>Liver Diseases</p> <ul style="list-style-type: none"> • Assessment of Liver Function • Hepatitis • Cirrhosis • Effects of alcohol on the Liver • Hepatic Encephalopathy • Liver Transplant • Wilson’s Disease <p>Diseases of the Gall Bladder</p> <ul style="list-style-type: none"> • Cholecystitis • Dyskinesia • Cholelithiasis <p>Diseases of the Pancreas</p> <ul style="list-style-type: none"> • Acute and Chronic Pancreatitis • Pancreatic Cancer 	15
Unit III	Endocrine disorders and autoimmune disorders <p>Type 1 Diabetes</p> <p>Thyroid diseases</p> <p>PCOS</p> <p>Cushing’s syndrome</p> <p>Addison’s disease</p>	15

	<p>Rheumatic and auto immune Diseases</p> <ul style="list-style-type: none"> • Arthritis-Osteo and Rheumatoid • Gout • Fibromyalgia • SLE 	
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References

Gibney J.M.,(2005). *Clinical Nutrition* Blackwell Publishing House.

King K. (2003). *Nutrition Therapy* 2nd ed. Helm Publishing, Texas

Bendich.A (1997).*Preventive Nutrition* Humana Press

Burke .L (2006).*Clinical Sports Nutrition* 3rd ed. McGraw Hill Co

McArdle.W (2005). *Sports and Exercise Nutrition*, 2nd ed. Lippincot Williams and Wilkins

Peckenpaugh .N (2003).*Nutrition Essentials and Diet Therapy*.9th ed. Saunders Pub Co.

Blackwell Scientific Publication (1994).*Manual Of Dietetic Practice*.2nd ed.

Brown .J. (2002).*Nutrition Through The Lifecycle*. Wadsworth Pub Co.

Jamison .J. (2003).*Clinical Guide To Nutrition and Dietary Supplements in Disease Management* Churchill –Livingstone Pub.

Jeejeebhoy et al (1988) *Nutrition and Metabolism in Patient Care* W.B.Saunders CO.

Lee. R.D. (2003) *Nutritional Assessment* 3rd ed. M c Graw Hill Pub.

McCormic .d.(1999) *Annual Review of Nutrition* vol 19 &20. Annual Reviews , California.

Mahan .K.L.(2008) *Krause’s Food and Nutrition Therapy* Saunders Pub.

Course Code	Title	Periods/Week/Division	Marks	Credits
PSHSIA303	Nutritional Epidemiology	4	100	4

Objectives:

1. To impart knowledge and develop skills related to epidemiologic concepts and methodologies to examine nutritional aspects of health and disease in populations.
2. To impart knowledge and develop skills in design and measurement of nutritional parameters in population based studies of health and disease.
3. To help students learn and critically evaluate nutritional assessment methodologies used for the populations.
4. To help students to describe the current state of epidemiological evidence for relationships of the diet to the selected diseases.

Units	Course Content	Periods
Unit I	<p>Introduction to Epidemiology, Nutritional Epidemiology and Epidemiological Research.</p> <ul style="list-style-type: none"> • Meaning, Definition, Purpose and Principles of Epidemiology. • Meaning of Nutritional Epidemiology. Glossary of terms used in nutritional epidemiology. • Importance of nutrition epidemiology in developing countries with special reference to India. • Nutritional Epidemiologic study methods. Types of study-Epidemiological studies, Ecological studies, Cross-sectional studies, Cohort studies, Case control studies, Experimental studies, Clinical trials, Community trials etc. • Study design: Sampling techniques, study size and power. • Interpretation of causes and effects in Nutritional Epidemiology. • Malnutrition and Infection vicious cycle-UNICEF Conceptual model of Malnutrition. 	15
Unit II	<p>Nutritional Epidemiology-Measurements.</p> <ul style="list-style-type: none"> • Measurement of exposure and outcome and their relation. • Dietary Exposure-National, Household, Institution and Individual level (NHFS and NNMB) • Biomarkers and nutrient intakes. • Methods of dietary assessment at the individual level. • Nutritional Anthropometry-Variou parameters and Growth monitoring and promotion. • Comparison with norms, standards, Z-scores. • Interpretation of the nutritional assessment data and its significance • Socio-demographic and psychosocial variables. • Determining Validity and Reliability • Sources of errors for different methods of measurement relating to nutritional exposures. • Measuring outcomes-Morbidity, Mortality, Rates and Ratios-Incidence, Prevalence • Measuring diet-disease (exposure-outcome) associations. • Expressing results from nutritional epidemiological studies.-Meta Analysis. 	15
Unit III	<p>National Goals, Policies, Schemes and Programmes related to Nutrition and Health.</p> <ul style="list-style-type: none"> • Nutrition Related Health Goals and Millennium Development Goals. (MDGs). • National Rural Health Mission-Vision, objectives, strategies and outcomes of the mission. • Health Care Delivery system in India. • Universal Immunization Programme. • National Nutrition Policy – a summary of important aspects. • Food Security –in Anthropocene Era. National Food Security Act (NFSA) 2013. • An overview of plans and services (local, state, national and international) related to Public Health Nutrition. • Initiatives for prevention of disease e.g. Water, air and vector borne diseases. 	15

References:

- Gibney, M.J. Margetts, B.M., Kearney, J.M. and Arab, L. (2012). *Public health Nutrition*. The Nutrition Society Blackwell Publishing Company, Oxford, Kent, UK
- Jelliffe, D.B. (1966). *The Assessment of the Nutritional Status of the community*, WHO Geneva.
- Lee, R.D. and Nieman, D.C. (2003). *Nutritional Assessment* 3rd Ed. McGraw – Hill Higher education. New York.
- Nutrient Requirements and Recommended Dietary Allowances for Indians, 'A Report of The Expert Group of Indian Council of Medical Research'*. (2013) ICMR.
- Sachdev, H.P.S. and Choudhary, P (eds). (1994). *Nutrition in Children-Developing country Concerns*, B.I.Publications Pvt. Ltd. New Delhi.
- Sainani, G.S. (ed-in-chief) (1992), *A.P.I. textbook of Medicine* 5th ed. Association of Physicians of India Mumbai.
- Sheila ChanderVir (ed)(2011)*Public Health Nutrition in Developing countries –Part I & Part II* Woodhead Publishing India Pvt. Ltd, New Delhi
- Nweze Eunice Nnakwe(2009)*Community Nutrition:Planning Health Promotion and Disease Prevention*.Jones&Bartlette Publishing House

Course Code	Title	Periods/Week/Division	Marks	Credits
PSHSIA304	Nutrition For Exercise & Fitness	4	100	4

Objectives:

1. To enable students to understand
2. Importance of holistic fitness for health
3. Role of exercise and nutrition in fitness
4. Nutritional needs and problems of sports persons

Units	Course Content	Periods
Unit I	<p>Definition and domains of fitness-Physical, Mental, Social & Spiritual domains of fitness</p> <p>Components of physical fitness</p> <p>Health oriented components -cardiovascular endurance, muscular strength, muscular endurance, flexibility, and body composition.</p> <p>Skill oriented components-agility, balance, coordination, power, reaction time, and speed</p> <p>-Factors influencing Physical fitness - Role of exercise and nutrition in Physical fitness,</p> <p>Psychological Fitness- stress- Causes, consequences & strategies of management.</p>	15
Unit II	<p>Role of exercise and nutrition in fitness</p> <p>A-Types of exercise-Endurance & resistance exercise</p> <ul style="list-style-type: none"> o Role of exercise in the prevention and management of chronic degenerative diseases-Obesity, Diabetes, CVD, Cancer, Bone health etc. • --Guidelines for physical activity- National and international <p>B-Effect of malnutrition on body composition and exercise performance</p> <p>-Effect of macro (carbohydrates, amino acids, EFA) and micronutrients (Vitamins & Minerals) on physical & mental fitness</p>	15
Unit III	<p>Nutrition and Physical Fitness in sports persons</p> <ul style="list-style-type: none"> • -Classification of sports activities, • -Body Composition of Sports Persons • -Energy metabolism during Exercise (aerobic and anaerobic) • -Utilisation of Carbohydrates, Protein and fat during Exercise • -Micronutrients and sports performance • -Fluid and Electrolyte needs of sports persons • -Nutritional problems of athletes • -Ergogenic Aids 	15

References

- Powers, S. and Dodd, Stephen (1996) *Total fitness*, Allyss and Bacon, Univ. of Florida
- Hoeger, W., Turner, Low and W. Hafen Brent (2002), *Wellness Guidelines for ahealthy life style* Wadsworth/Thomas Learning USA.
- Brannon, L. and Feist, Jess (2000), *Health Psychology IV edition, An Introduction to behaviour and health*, Wadsworth USA.
- Schafer Walt (1998) *Stress Management for IV ed. Wellness* Wadsworth USA.
- Mind, body and soul* (1998) The body shop, Bullyinch press book, little Brown and co.
- Bhat and Savur, S. (1998) *Fitness for life*, Jaico publishing House, Mumbai
- Hamlyn, *Encyclopedia for Complimentary Health* (1996)
- Wolinsky, Ira (1998) *Nutrition in Exercise & Sport* (3rded.)
- Fred and Brouns (2002) *Essentials of Sports Nutrition* (2nd ed.), John Wiley & Sons pub.
- Mc Ardle, W.D. &Katch (2005) *Sports and Exercise Nutrition* (4thed.) Williams & Wilkins, A Waverly Company.
- Williams, C. &Delvin, J.T. (1992) *Foods, Nutrition & Sports Performance* (1sted.)E. & F.N. Sons' Pub.

Course Code	Title	Periods/Week/Division	Marks	Credits
PSHSIAP301	Research Dissertation	4	100	4

Objectives

1. To guide students in developing general research skills as well as research skills specific to their specialization.
2. To encourage students to work in conjunction with relevant industries, institutes, hospitals, NGOs and schools.
3. To encourage students to adopt best practices in research.
4. 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 two chapters of the dissertation (Introduction and Review of Literature; Proposed Methodology).

Course Content		Periods
Unit 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 (6 th Ed) -Plagiarism Check Softwares	15
Unit II	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 <i>Introduction and Review of Literature</i> , with due acknowledgement of source of ideas.	15
Unit III	Proposed Methodology -Specifying variables; defining variables (citing relevant literature) -Selecting an appropriate research design -Writing the second chapter of the dissertation, namely, the <i>Method</i> , with due acknowledgement of source of ideas; orally defending a research proposal; integrating feedback. -Obtaining consent from participants and relevant agencies/authorities; starting data collection; integrating changes if any; scheduling remaining data collection; starting data entry; revising the first two chapters of the dissertation.	15

Course Code	Title	Periods/Week/Division	Marks	Credits
PSHSIAP302	Therapeutic Dietetics - I	4	100	2

Objectives

1. To provide a detailed practical aspect to the clinical conditions studied in theory
2. To enable students to:
 - i. Analyse the given case
 - ii. To reach a nutritional diagnosis
 - iii. Propose a nutrition plan for the patient
 - iv. Prepare the selected meal
 - v. Evaluate the suggested diet plans

Units	Contents	Periods
Unit I	Review of Diet Planning and its adaptations to different life cycle conditions Understanding the role of supplements and nutraceuticals (Review) Obesity and Metabolic syndrome – Planning and Preparation of diets for the following <ul style="list-style-type: none"> • Juvenile Onset and Adult Onset obesity • Bariatric Surgery • VLCD • Metabolic Syndrome 	15
Unit II	Diabetes – Planning and Preparation Type I DM ,Type II DM Cardiovascular Diseases – Planning and Preparation <ul style="list-style-type: none"> • Atherosclerosis – Prevention and Management • Myocardial infarction, Congestive cardiac failure • Hyperlipidemias • Hypertension • Cardiac Surgery 	15
Unit III	Enteral Feeds - Planning and Preparation Hypercatabolic States – Planning and Preparation <ul style="list-style-type: none"> • Burns • Surgery • Accident Victim • Trauma • Head Injury Pulmonary Diseases – Planning and Preparation <ul style="list-style-type: none"> • Asthma • COPD • Chronic Bronchitis ▪ Cystic Fibrosis. 	15

References

- Gibney, J.M.,(2005). *Clinical Nutrition* Blackwell Publishing House.
- King, K. (2003). *Nutrition Therapy* 2nd ed. Helm Publishing, Texas
- Bendich, A (1997). *Preventive Nutrition* Humana Press
- Peckenpaugh, N (2003). *Nutrition Essentials and Diet Therapy*. 9th ed. Saunders Pub Co. Blackwell Scientific Publication (1994). *Manual Of Dietetic Practice*. 2nd ed.
- Brown, J. (2002). *Nutrition Through The Lifecycle*. Wadsworth Pub Co.
- Jamison, J. (2003). *Clinical Guide To Nutrition and Dietary Supplements in Disease Management* Churchill – Livingstone Pub.
- Jeejeebhoy, et al (1988). *Nutrition and Metabolism in Patient Care* W.B.Saunders CO.
- Lee, R.D. (2003). *Nutritional Assessment* 3rd ed. M c Graw Hill Pub.
- Mahan, K. L. (2008). *Krause's Food and Nutrition Therapy* Saunders Pub.
- Garrow, J.S (1993). *Human Nutrition and Dietetics* 9th ed. Churchill Livingstone Pub.
- Shills, M. (2006). *Modern Nutrition in Health and Disease*. 10th ed. Lippincot William and Wilkins
- ICMR Pub. (2000). *Nutrient Requirement and Recommended Dietary Allowances for Indians*
- Gopalan .C. (2000). *Nutritive Value of Indian Foods*. NIN ICMR Pub.
- Whitney .C. (2006) *Understanding Normal and Clinical Nutrition*. Wadsworth publication
- Sauberlich .H (1999) *Laboratory Tests for the Assessment of Nutritional Status* 2nd ed. CRC Press

Course Code	Title	Duration	Marks	Credits
PSHSIAP303	Internship	40 hours/ week for 1 month	50	2

Internship Protocol

-Students are required to take up an internship/hands-on training in either of the following for a minimum of 4 weeks with 40 hours per week.

- Government/ Private hospitals/Nursing homes/Clinic
- GO/NGO
- Food Industry
- Fitness centres/Gymnasiums
- Research Laboratories

- At the end of internship students are required to submit a soft copy and hard-bound report to the college.

-Internship will be graded by the supervisor at the place of internship on completion of the internship.

- Alternatively, students can also take up an entrepreneurial activity or term paper of equal weightage as per the discretion of the department (Subject to approval of the Department Head).

M.Sc. (Home Science)
Branch IA : Foods, Nutrition and Dietetics

Semester IV

Sub Code	Title	Internal Assessment Marks	Semester End Marks	Total Marks	Periods/ Week/ Batch/ Division	Credits
PSHSIA401	Advances in Human Nutrition – II	40	60	100	4	4
PSHSIA402	Nutritional Therapeutics	40	60	100	4	4
PSHSIA403	Public Health Nutrition	40	60	100	4	4
PSHSIA404	Food Psychology	40	60	100	4	4
PSHSIAP401	Dissertation	-	-	100	10	4
PSHSIAP402	Therapeutic Dietetics - II	-	-	50	4	2
PSHSIAP403	Alternative Health Strategies and Therapies	-	-	50	-	2
	Total			600	30	24

Course Code	Title	Periods/Week/Division	Marks	Credits
PSHSIA401	Advances In Human Nutrition-II	4	100	4

Objectives :

To enable students to understand

1. Issues in the field of human nutrition and contributions of research towards addressing the same
2. Complementary nutrition strategies for achieving and maintaining health
3. Need and concerns of genetic modification of foods

Units	Course Content	Periods
Unit I	A. Micronutrients-Vitamins: Over view of Classification, digestion, absorption and transportation; and Current research in the functions, Requirements, deficiency & toxicity; Assessment of nutritional status of Fat soluble –A,D,E& K: & Water soluble vitamins (B-Complex vitamins and vitamin C). B: Interrelationship between vitamins;& vitamins and macronutrients	15
Unit II	A: Micronutrients-Minerals : Over view of Classification, digestion, absorption and transportation; and Current research in the functions, Requirements, deficiency & toxicity; and 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	15
Unit III	A : Nutritional requirements for special conditions - Extreme climatic conditions, High altitude and space nutrition; Nutrition during natural calamities B: Complementary Nutrition- Basic and advanced aspects Classification, Health benefits, Mechanism of action, sources & recommendations of <ul style="list-style-type: none"> • Prebiotics, Probiotics and Synbiotics -Types, Sources of prebiotics and probiotics, Health benefits, Regulations • Bioactive Dietary Components, Functional foods, Phytochemicals, Flavonoids, Phytoestrogens • Meal Replacers, - Classification, Health benefits, Mechanism of action, Recommendations & concerns 	15

References:

- Grodd, J.L. and Gropper, S.S. (1999) Advanced Nutrition and human metabolism. Belmont 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, 9th 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, E.E and Filer, L.J. (1996) Present knowledge in nutrition. Washington D.C. International Life Sciences Institute

Course Code	Title	Periods/Week/Division	Marks	Credits
PSHSIA402	Nutritional Therapeutics	4	100	4

Objectives

- To expose students to the nutritional care process, the role of a nutritionist and the methods employed in nutrition provision and intervention.
- To impart knowledge regarding prevalence, etiology, diagnosis, pathophysiology, drug nutrient interactions, gene – nutrient interactions and medical, nutritional and lifestyle management in different disease conditions.
- To enable students to understand advances in clinical nutrition, emerging modes of therapy and intervention and ongoing research in the field.
- To emphasize the role of nutrition in the prevention of chronic disease.
- All diseases (acute and chronic) will be discussed with reference to the following topics:-
- Etiology, risk factors, Diagnosis, classification, pathophysiology.
- Management –
 - Nutritional
 - Lifestyle and exercise
 - An overview of medical, surgical and other interventions(whenever applicable)
- Drug – nutrient and gene- nutrient interactions
- Advances and trends in research in the disease conditions.
- Available supplements and nutraceuticals

Unit	Content	Periods
Unit I	Renal Diseases <ul style="list-style-type: none"> Tests for renal function Glomerulonephritis Nephrotic Syndrome Acute Renal failure Chronic Renal failure and ESRD Dialysis – Haemo, Peritoneal and CAPD Renal Transplant Nephrolithiasis 	15
Unit II	Nutritional Management of <ul style="list-style-type: none"> PEM Nutritional Anaemias Low immunity and infections <ul style="list-style-type: none"> General Principles Tuberculosis HIV / AIDS Typhoid Respiratory diseases <ul style="list-style-type: none"> COPD Asthma Cystic Fibrosis 	15
Unit III	Principles of Nutritional Therapy in the management of the following: <ul style="list-style-type: none"> Inborn errors of metabolism <ul style="list-style-type: none"> Principles of genetic disease management Phenylketonuria Tyrosinaemia Alkaptonuria Maple Syrup Urine Disease Galactosaemia Nutrition in Neurological and Psychiatric Disease <ul style="list-style-type: none"> Nutritional causes for neurological disorders Senility Alzheimer’s and Parkinson’s disease Epilepsy Cerebral Palsy Schizophrenia and Psychosis Management of conditions related to the loss of nerve function – stroke and paralysis Nutrition for bone health and disease <ul style="list-style-type: none"> Vitamin D deficiency Osteomalacia Osteoporosis. 	15

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Journals

American Journal of Clinical Nutrition
Journal of American Dietetic Association.
Nutrition Revi

Course Code	Title	Periods/Week/Division	Marks	Credits
PSHSIA403	Public Health Nutrition	4	100	4

Objectives

1. To impart knowledge related to the concept and the process of Public Health Nutrition.
2. To increase awareness about current and emerging issues in Public Health Nutrition.
3. To apply the knowledge to solve nutrition related health problems.
4. To understand and critically evaluate the impact of research on the practice of Public health Nutrition

Units	Course Content	Periods
Unit I	<p>An overview of Public health Nutrition</p> <ul style="list-style-type: none"> • Definitions of Public Health and Public Health Nutrition. • Overview of Public Health Nutrition Landscape-with special reference to India. • The Public health nutrition cycle-7Steps. • Public Health Nutrition strategies for Intervention at the Ecological level- Key Principles, Intervention. Guidelines for using the ecological approach to design nutrition interventions, Ecological interventions to change eating habits. • Public Health Nutrition strategies for Intervention at the Individual level- Possible approaches, Theoretical models for behaviour change, Key steps involved in planning, implementing and evaluating an intervention 	15
Unit II	<p>Dietary Guidelines</p> <ul style="list-style-type: none"> • Dietary goals versus dietary guidelines. • Quantitative and Qualitative dietary guidelines. • Steps involved in devising dietary guidelines. <p>Food Choice</p> <ul style="list-style-type: none"> • Population issues affecting food choice. • Individual issues affecting food choice. • Assessment of Nutritional Status in Individuals and Populations. <p>New-born care, child survival, Child Undernutrition and nutritional status of women and Children.</p> <ul style="list-style-type: none"> • Breast feeding and complementary feeding for Infants and young children-issues and current status. Strategies to reach under two. • PEM among children. -Medium Acute Malnutrition, Severe Acute Malnutrition in children and their management. • Measuring under nutrition and over nutrition in children. • Dual nutrition burden in women: causes, consequences and control measures. Interventions to improve dietary intake and nutritional status in women. 	
Unit III	<p>Public health Issues -Study of the following with greater emphasis to the current Indian context.</p> <ul style="list-style-type: none"> • Nutrition and Reproductive health • Maternal nutrition, Intrauterine Growth Retardation (IUGR)andfoetal outcome. • Geriatric Nutrition and Common health problems. • Public Health Impact of Obesity-Obesity as a determinant of mortality and morbidity ➤ Micro nutrient deficiency. • Hidden Hunger • Vitamin A deficiency. • Vitamin D deficiency • Iodine Deficiency Disorders. • Iron deficiency and anaemia • Zinc Deficiency <p>HIV and macronutrients and micronutrient nutrition</p> <p>Public Health Nutrition strategies related non-communicable chronic disorders-</p> <p>Prevalence of non-communicable diseases at global and national level</p> <p>Prevention and Control of NCDs</p> <ul style="list-style-type: none"> • Cancers • Diabetes • Hypertension. • CVD <p>Nutrition –Health education and communication for behaviouralchange. Techniques and Methodologies.</p> <p>Research Methods used in Public health nutrition: critical Factors-Case Studies.</p>	15

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Course Code	Title	Periods/Week/Division	Marks	Credits
PSHSIA404	Food Psychology	4	100	4

Objectives:

1. To understand the relevance and applications of models and influencing factors of food choices and eating behavior.
2. To understand the applications of food psychology for health, disease prevention and product development.
3. To study perceptions and factors influencing food choices from the point of view of the food consumer.

Unit	Course Content	Periods
Unit I	<p>The psychology of food choices and eating behavior</p> <ul style="list-style-type: none"> • Models of food choice • Influences on food choice <p>Biological</p> <ul style="list-style-type: none"> • Genetic influences on energy and nutrient intake • Neurobiology of food intake <p>Social and psychological models of food choice</p> <ul style="list-style-type: none"> • Role of family and peers • Food and Culture • Mood ,emotions and food choice • Food cravings and addiction • Food Rewards <p>Influences of Media on food choice</p> <p>Food choices across the life span.</p> <p>Food product development and marketing ideas based on factors affecting choice of foods.</p>	
Unit II	<p>Applications of food psychology for health maintenance and disease prevention</p> <ul style="list-style-type: none"> • Strategies to change dietary behavior <ul style="list-style-type: none"> • Optimisim and intention • Strategic automisation • Using stages of change model to change dietary behavior • Applications of food psychology in pediatric population <ul style="list-style-type: none"> • Ingestive homeostasis • Early and conditioned food preferences • Development of human flavor preferences • Taste aversion • Role of experience in in the development of child’s eating behavior. • Alcohol and tobacco use and abuse • Role of stress in choosing foods • Behavior modification strategies to influence food and nutrition choices in disease conditions. <ul style="list-style-type: none"> • Obesity - Behavioural phenotype in obesity, mindful eating • Diabetes • Allergies • Cancer • Theory of planned behavior and healthy eating • Food product development and marketing ideas based on applications of food psychology for health maintenance and disease prevention. 	
Unit III	<p>Psychology of the food and nutrition consumer</p> <ul style="list-style-type: none"> • The psychology of the food shopper <ul style="list-style-type: none"> • Cues in consumer perception and acceptance of food product • Factors affecting food purchase • Food quality and consumer expectations • Packaging and labeling based on the psychology of the consumer • Ethnic ,religious and economic influences on food choice of the consumer • Consumer perception of processed foods ,supplements, organic and genetically modified foods • Food trends and the changing consumer <ul style="list-style-type: none"> • Consumer attitudes to health • Factors affecting the consumers healthy food choices • Ecological consciousness and sustainability with regard food consumption <ul style="list-style-type: none"> ❖ Environmental influences in food purchase. ❖ Encouraging ethical and sustainable food consumption. • Food product development and marketing to positively impact nutrition status. 	

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Course Code	Title	Periods/Week/Division	Marks	Credits
PSHSIAP401	Research Dissertation	4	100	4

Objectives:

1. To encourage students to work in conjunction with relevant industries, institutes, hospitals, schools, etc.
2. To assist students in developing general research skills as well as research skills specific to their specialization.
3. To encourage students to adopt best practices in research.
4. To facilitate students in completing laboratory work/product development/data collection/data entry/data analysis, and writing the remaining three chapters of the dissertation (Results, Discussion, Summary).
5. To support students to complete and submit the dissertation for the viva voce examination, integrate feedback, submit the final copy of the dissertation, and write a research paper using the findings of their research.

Course Content		Periods
Unit I	<p>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 <i>Results</i>, by research objectives/ questions/hypotheses; orally presenting the results and integrating feedback.</p>	15
Unit II	<p>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 <i>Discussion</i>, using appropriate scientific protocol</p>	15
Unit III	<p>Summarizing Findings and Completing the Writing of the Dissertation Writing the fifth chapter of the dissertation, namely, the <i>Summary</i>; writing the abstract; revising previous chapters as necessary; completing all other relevant work for the dissertation (e.g., reference list, appendices, table of contents, and list of figures/tables); submitting the dissertation for the viva voce examination. Submission and Oral Defense; 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</p>	15

Course Code	Title	Periods/Week/Division	Marks	Credits
PSHSIAP402	Therapeutic Dietetics -II	4	100	2

Objectives

- To provide a detailed practical aspect to the clinical conditions studied in theory
- To enable students to:
 - Analyse the given case
 - Obtain a nutritional diagnosis
 - Propose a nutrition plan for the patient
 - Prepare the selected meal
 - Evaluate the suggested diet plans

Units	Contents	Periods
Unit I	Assignment presentation of Nutritional Care Protocol GI diseases (Planning and Preparation) <ul style="list-style-type: none"> Esophagitis Gastritis and peptic ulcers Gluten induced enteropathy Lactose intolerance Inflammatory bowel disease Short bowel syndrome Irritable bowel syndrome Diverticulitis Haemorrhoids Diseases of the Liver Gall bladder and Pancreas (Planning and Preparation) <ul style="list-style-type: none"> Hepatitis Cirrhosis Encephalopathy Gallbladder disease Chronic Pancreatitis Wilson's disease 	15
Unit II	Disease of the Kidney (Planning and Preparation) Glomerular Nephritis, Nephritic syndrome Acute Renal Failure, Chronic Renal Failure Haemodialysis, Peritoneal Dialysis Renal Transplant, Renal Calculi Cancer Therapy (Planning and Preparation) Patients on chemotherapy, Patients on Radiation Head and Neck Cancer, GI Cancers Bone Health and Bone Joint Disease (Planning and Preparation) Bone Health Osteoporosis, Osteoarthritis Gout, Rheumatoid arthritis	15
Unit III	Infections (Planning and Preparation) HIV Tuberculosis Malaria, Dengue Food Borne Infection Haematological Conditions (Planning and Preparation / Presentation)	15

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Course Code	Title	Periods/Week/Division	Marks	Credits
PSHSIAP403	Alternative Health Strategies and Therapies	2	50	2

Objectives

1. To have students learn about alternative health strategies and therapies through engagement in participatory workshops.

Units	Contents	Periods
Unit I	Organising and participating in workshops that teach Eastern alternative health strategies and therapies such as the following: <ul style="list-style-type: none"> • Yoga • Mindfulness and meditation • Ayurveda • Energy healing • Laughter therapy • Acupuncture / acupressure • Any other 	15
Unit II	Organising and participating in workshops that teach Western alternative health strategies and therapies such as the following: <ul style="list-style-type: none"> • Music therapy • Dance therapy • Art-based therapy • Nature therapy • Hypnotherapy • NLP • Any other 	15

- At the end of term, students are required to submit a soft copy and hard-bound report to the college which will be graded and a viva-voce will also be conducted
- Note: Common paper with the Department of Human Development and Department of Textile and Fashion Technology.

Examination Scheme for MSc Home Science:

Part A: Theory Papers

All theory papers of 100 marks are to be evaluated in two parts.

INTERNALS: 40 marks. This comprises 30 marks for a project, 5 marks for class participation, and 5 marks for the extent to which the student was a responsible learner. See Table below:

<ul style="list-style-type: none">• One seminar presentation based on the curriculum in the college, assessed by the teacher of the institution teaching PG learners / Publication of a research paper/ Presentation of a research paper in seminar or conference. A. Selection of the topic, introduction, write up, references- 15 marks. B. Presentation with the use of ICT- 15 marks.• Other exercises of equal weightage can also constitute the project: For example, conducting interviews or assessments based on the topics in the curriculum; or reflective writing exercises on topics relevant to the curriculum; or product designing.	30 Marks
<ul style="list-style-type: none">• Active participation in routine class instructional deliveries	05 Marks
<ul style="list-style-type: none">• Overall conduct as a responsible learner, communication and leadership qualities in organizing related academic activities	05 Marks

SEMESTER-END EXAMINATION: 60 marks. The semester-end question paper is for 2 ½ hours. The semester-end examination question paper has to be set with limited choice within each set of questions.

For all four unit syllabi, the question paper must have five sets of questions of 12 marks each; each of the five questions is compulsory, with options within each question:

- Question 1, carrying 12 marks, has a set of sub-questions from Unit I. Possible sub-questions include the following formats: Answer any 2 sub-questions out of 3, or any 3 out of 5, or any 4 out of 6.
- Question 2, carrying 12 marks, has a set of sub-questions from Unit II. Possible sub-questions include the following formats: Answer any 2 sub-questions out of 3, or any 3 out of 5, or any 4 out of 6.
- Question 3, carrying 12 marks, has a set of sub-questions from Unit III. Possible sub-questions include the following formats: Answer any 2 sub-questions out of 3, or any 3 out of 5, or any 4 out of 6. (Format may be modified for a lengthier statistics sum.)
- Question 4, carrying 12 marks, has a set of sub-questions from Unit IV. Possible sub-questions include the following formats: Answer any 2 sub-questions out of 3, or any 3 out of 5, or any 4 out of 6. (Format may be modified for a lengthier statistics sum.)

- Question 5, carrying 12 marks, has a set of sub-questions from Units I, II, III, and IV. Possible sub-questions include the following formats: Answer any 2 sub-questions out of 3, or any 3 out of 5, or any 4 out of 6.

	Total Marks/ Duration	Internal Assessment	Semester End Exams	Pattern
Theory Papers	100 marks/ 2 ½ hours	40	60	Q 1.(12 marks)- Unit 1 Q 2.(12 marks)- Unit 2 Q 3.(12 marks)- Unit 3 Q 4.(12 marks)- Unit 4 Q 5.(12 marks)- Units 1, 2, 3, 4, & 5

For all three unit syllabi, the question paper must have four sets of questions of 15 marks each; each of the four questions is compulsory, with options within each question:

- Question 1, carrying 15 marks, has a set of sub-questions from Unit I. Possible sub-questions include the following formats: Answer any 2 sub-questions out of 3, or any 3 out of 5, or any 5 out of 8.
- Question 2, carrying 15 marks, has a set of sub-questions from Unit II. Possible sub-questions include the following formats: Answer any 2 sub-questions out of 3, or any 3 out of 5, or any 5 out of 8. (Format may be modified for a lengthier statistics sum.)
- Question 3, carrying 15 marks, has a set of sub-questions from Unit III. Possible sub-questions include the following formats: Answer any 2 sub-questions out of 3, or any 3 out of 5, or any 5 out of 8. (Format may be modified for a lengthier statistics sum.)
- Question 4, carrying 15 marks, has a set of sub-questions from Units I, II, & III. Possible sub-questions include the following formats: Answer any 2 sub-questions out of 3, or any 3 out of 5, or any 5 out of 8.

	Total Marks/ Duration	Internal Assessment	Semester End Exams	Pattern
Theory Papers	100 marks/ 2 and ½ hours	40	60	Q 1.(15 marks)- Unit 1 Q 2.(15 marks)- Unit 2 Q 3.(15 marks)- Unit 3 Q 4.(15 marks)- Units 1, 2 and 3

Part B: Practical Papers

Each Practical Paper of 50 marks will be evaluated in a semester-end examination of 50 marks. There are no internal marks for these practical papers. The semester-end examination is of 3 ½ hours.

	Total Marks/ Duration	Internal Assessment	Semester End Exams	Pattern
Practical Paper	50 marks/ 3 ½ hours	-	50	-

Dissertation carries 100 marks in each of Semesters III and IV. Of these 100 marks, 50 marks are to be scored by the guide (25 marks for execution of the project/process & 25 marks for the final outcome of the project), and 50 marks by the referee(s) on the day of the viva-voce examination (25 marks for the written submission & 25 marks for the viva).