



**NAGINDAS KHANDWALA COLLEGE
OF COMMERCE, ARTS &
MANAGEMENT STUDIES (AUTONOMOUS)**

Re-accredited by NAAC with 'A' Grade (3rd Cycle)
ISO 9001:2015 Certified

**Bhavishya Bharat Campus, S. V. Road, Malad (West)
Mumbai-400 064**

Programme Code: PMSIND

M.Sc. in Integrative Nutrition & Dietetics
Two Year Integrated Programme -

Four Semesters

Course Structure

**Under Choice Based Credit, Grading and Semester
System**

Implemented during Academic Year- 2021-2022

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1. Preamble

The Nutrition Industry is experiencing accelerated growth in several sectors amid a burgeoning global shift in consumer behavior regarding what we put in our bodies, aging population desiring improved muscle, joint, and cognitive health, and emerging middle and affluent classes in key markets.

The growth in this industry is primarily driven by the increasing focus on personal health and wellbeing. With a shift in urban lifestyle towards sedentary, there is a renewed focus on fitness to avoid lifestyle-related diseases and deal with stress. Seeking professional guidance for fitness and slimming are no longer considered a luxury, but an elementary part of a healthy lifestyle. This change in consumer behavior and preferences will continue to provide an impetus to the industry.

Recruitment and retention of skilled manpower is the biggest challenge faced by the industry today. There is a dearth of good training institutes, with standardized and accredited courses.

The vocational training programs often impart theoretical knowledge with little hands-on experience. Hence, in-house training becomes the only option for companies to equip the workforce with the relevant skill set. There is a very limited pool of skilled professionals available in the country whereas the demand is huge. The attrition rate in the industry is high and retaining experienced professionals has become a key challenge. There are no dedicated government institutes or training centers to equip people with desired skills. Hence, there is a need for Recognized Degree and Diploma programmes in Integrative Nutrition & Dietetics.

1.1 About Khandwala College

Khandwala College is a multi-faculty institution (Estd. 1983), affiliated to University of Mumbai. It offers 23 UG, 6 PG, 4 Add On, 3 Ph. D with 9 Departments and 2 Research Centres imparting education to more than 6500 students. The Vision of the institute includes Education for all, Education for the youth and Education for the future of our country. The Mission is to serve the society at large and students belonging to linguistic minority in particular with commitment, dedication and devotion. The Quality Policy includes commitment towards imparting Quality Education to youth, enabling them to develop the right attitude, professional competence and inculcating right ethical values.

The institution has been awarded “A” Grade (Third Cycle) by National Assessment and Accreditation Council, Best College by University of Mumbai (2012), lead college for a cluster of colleges, Educational Excellence Award by Indus Foundation, USA and Best Ensemble Faculty (Academic Brilliance Awards – 2013) by Education Expo TV’s Research Wing for Excellence in Professional Education & Industry and ISO 9001:2015 certified by TUV Nord. We have been awarded IMC Ramkrishna Bajaj National Quality Commendation Certificate in 2013-14. Our college has been awarded Autonomous status from 2016. Khandwala College, as

an Autonomous College; is offering a new Bachelor of Tourism & Travel Management (BTTM) Programme as a Three-Year Integrated Programme – with Six Semesters Course Structure - Under Choice Based Credit, Grading and Semester System.

1.2 Vision and Mission of Khandwala College

Vision

Education for all

Education for the youth

Education for the future of our country

Mission

The college's focus is on the future of our students irrespective of their gender and place in society. Every student is like a flame reaching out to the brightness of the sun i.e. the bright future of India

2. Programme Objectives & Outcomes

2.1 Programme Objectives

1. To provide intensive theoretical & practical knowledge related to the field of nutrition & dietetics.
2. To provide an integrated perspective of nutrition & dietetics along with a good amount of exposure to real life cases / technical knowhow.
3. To analyze the macro and micronutrient content, nutrient density, and additional food components of a client's diet.
4. To design culturally sensitive food plans that support changing nutritional needs during the various lifecycle stages and promote disease prevention and management.
5. To formulate comprehensive clinical intervention plans that incorporate whole foods, supplements, lifestyle changes, and other integrative health approaches.
6. To apply the nutrition care process to assess status, develop nutrition diagnoses and interventions, evaluate, and monitor the client's progress using a functional nutrition approach.
7. To develop personal mindful eating practices and guide groups or clients in mindfulness practices.

2.2 Programme Outcomes

After successful completion of the M.Sc. in Integrative Nutrition & Dietetics the learner will be able to:

1. Assess nutritional status of individuals in various life-cycle stages and determine nutrition-related conditions and diseases by applying knowledge of metabolism and nutrient functions, food sources, and physiologic systems.
2. Exhibit effective oral communication through personal interaction as well as classroom presentations, individually or as part of a group, to a larger audience.
3. Demonstrate critical thinking and analytical skills through writing and verbal assessments.
4. Possess skills and experience relating to health & nutrition consulting in a professional setting.

3. Eligibility, Selection and Admission Criterion

Candidates for being eligible for admission to the two-year course leading to the Degree of M.Sc. in Integrative Nutrition & Dietetics, shall be required to have passed the Graduation Examination or equivalent qualification from any recognized Board/ University

3.1 Eligibility Criterion

Passed Graduation in Bachelor of Science with specialization in fields such as Foods, Nutrition & Dietetics/ Bachelor of Home Science with Food Nutrition / Biotechnology /B.Sc. with Biochemistry / Life Science / Microbiology / Biochemistry / Biotec & Dietetics /B.Sc. with Biochemistry / B.Sc. with any other Biological Science / B.Sc. with Home Science/ B.Sc (Hons) Integrative Nutrition & Dietetics, etc. and related graduation. Lateral Entry shall be applicable for students who have pursued similar or related Programmes from any University. Eligibility Criteria shall be applicable for lateral entry.

3.2 Selection and Admission Criterion for Eligible Candidates

The interested students shall register for Aptitude Test and Interview. Reservations as per University rules will be applicable.

The admission of students shall be based on:

- Academic and non- academic credentials till date.
- Performance in Aptitude Test [comprising of questions in Mathematics/Statistics, English, Logical Reasoning, Analytical Ability], and Performance in Personal Interview.
- The candidate has to fulfil all the prescribed admission requirements / norms of the College.
- In all matters relating to admission to the programme the decision of the Management of institute/ college shall be final.
- At any time after admission, if found that a candidate has not fulfilled one or many of the requirements stipulated by the College, or submitted forged certificates, the Institute has the right to revoke the admission and will forfeit the fee paid. In addition, legal action may be taken against the candidate as decided by the Management of institute/ college.

3.3 Eligibility for the award of the degree

- A candidate shall be eligible for the award of the Degree only if he/she has undergone the prescribed course of study for a period of not less than two academic years, passed the examinations of all the Four Semesters earning 104 credits, and have completed 8 credits earned by successfully completing the required certifications, letter grade of at least D or above (i.e. O/ A+/A/ B+/B/C/D) in core.
- No dues to the Institute, Libraries etc.; and
- No disciplinary action is pending against him / her.

3.4 Faculty under which the Degree is awarded

M.Sc. in Integrative Nutrition & Dietetics programme is awarded under the faculty of Science

3.5 Intake and Fees

Intake of 60 Students in the first year with an additional division of 60 students from the second year onwards. Additional 15% shall be permitted to make provision for any cancellation of Admissions. Additional admissions to the extent of 15% will be permitted for foreign students every year.

Programme Fees for each Semester - Rs. 2,12,500/- . The fees can be increased by 12% every year.

3.6 Attendance

- A student has to obtain a minimum 75% cumulative attendance for the theory lectures, practical and tutorial (wherever prescribed) separately will be required out of the total number of lectures, practical and tutorials on the subject conducted in the term.
- 25% allowance in attendance is given to account for activities under NCC / NSS / Cultural / Sports / Minor Medical conditions etc.
- A student with a cumulative attendance of less than 75%, will not be permitted to appear for the end semester examination for all the courses in that semester and will be categorized as “DE”, meaning Detained due to shortage of attendance. The students with “DE” category cannot proceed to the subsequent semester.
- Such students shall register for all the courses of the semester in which DE has occurred, in the subsequent year by paying the prescribed fee.
- Additional condonation may be considered in rare and genuine cases which includes, approved leave for attending select NCC / Sports Camps, Internships, Training, cases requiring prolonged medical treatment and critical illness involving hospitalization.
- For medical cases, submission of complete medical history and records with prior information from the parent / guardian to the institute is mandatory. Such condonation is permitted only twice for a student in the entire duration of the programme.

4. Scheme of Examination

The Examination shall be divided into parts i.e. Continuous Internal Evaluation including Assignment, Projects, Seminars, Case Studies and Class Tests which will be of 40 marks and the Semester End Examinations which will be of 60 marks. The Semester Wise Credit Points will be varied from course to course but the value of Credits for Graduate Programme shall be of 104 Credits. Students will have to earn 8 extra credits under autonomy. This will be achieved by completing 2 certifications of 4 credits each from an approved list of certifications. The examinations can be conducted in online/offline mode. The institute may decide the examination pattern - written, oral, practical, presentation, project etc. for any or all courses/subjects as appropriate.

The Credits are defined in terms of the learner's hours which are divided into two parts such as Actual and Notional. The value of a particular course can be measured in number of Credit Points. The value of One (01) Credit is equal to 15 Hours of learners' load. Notional learning hours include direct contact hours with teachers and trainers, time spent in self learning, preparation for assignments, carrying out assignments and assessments etc.

Scheme of Total Credits

Sr. No.	Year	Credits
1	Year 1	52
2	Year 2	52
	Total Credits for Award of Degree	104
	Additional Credits	8
	Maximum Credits for Award of Degree	112

4.1 Credit Based Evaluation System Scheme of Examination

For all 4 semesters, the performance of the learners shall be evaluated into two components. The first component shall carry 40% marks which will be a Continuous Internal Evaluation while the second component shall carry 60% marks at semester end examination.

The allocation of marks for the Continuous Internal Evaluation 40% and Semester End Examination 60% are as shown below:

4.2 Structure of Continuous Internal Evaluation – 40% = 40 marks

Sr. No.	Particulars	Marks
1	Class test held in the given semester	15 marks

2	Subject specific Term Work Module/assessment modes – as decided by the department in the beginning of the semester (like Extension/field/experimental work, Short Quiz; Objective test, open book test etc. and written assignments, Case study, Projects, Posters and exhibits etc. for which the assessment is to be based on class presentations wherever applicable)	15 marks
3	Attendance & Active participation in routine class instructional deliveries (and in practical work, tutorial, field work, cultural activities etc. as the case may be)	10 marks

4.3 Structure of End Examination – 60% = 60 marks

Semester End Examination will be organized after all modules of the course are taught in the class.

It will be a written examination / or as per the needs of the course a practical examination or a combination of both. This examination will be for 60 marks.

The assessment of Continuous Internal Evaluation and Semester End Examination as mentioned above for the Semesters I to IV shall be processed by the College – ‘Institutions of their Learners’ and issue the grade cards to them after the conversion of marks into grades as the procedure mentioned below.

The learners to pass a course shall have to obtain a minimum of 40% marks in aggregate for each course where the course consists of Continuous Internal Evaluation & Semester End Examination. The learner shall obtain a minimum of 40% marks (i.e. 16 out of 40) in the Continuous Internal Evaluation and 40% marks in Semester End Examination (i.e. 24 out of 60) separately, to pass the course and a minimum of Grade D in each project, wherever applicable, to pass a particular semester. A learner will be said to have passed the course if the learner passes the Continuous Internal Evaluation & Semester End Examination together.

4.4 Suggested Question Paper Pattern

A) Written Class Test (15 Marks) - 30 mins

1.	Match the Column / Fill in the Blanks/ Multiple Choice Questions (Any Six out of Eight) (1 Marks each)	06 Marks
2.	(<i>Concept based Questions</i>) Answers the following (Attempt Any Two of Three) (2 Marks each)	04 Marks

3.	Answer in Brief (Attempt Any One of the Two) (5 Marks each)	05 Marks
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B) Semester End Examinations (60 Marks) - 2hrs

QI	Match the Column / Fill in the Blanks/ Multiple Choice Questions/True or False (Any 10 out of 15) (1 Marks each)	10 Marks
QII A	(<i>Concept based Questions</i>) Answer in Brief (Any Three out of Five) (5 Marks each)	15 Marks
	OR	
QII B	(<i>Concept based Questions</i>) Answer in Brief (Any Three out of Five) (5 Marks each)	15 Marks
QIII A	(Application based/Scenario based Questions) Answer in Detail (Attempt Any Four of Six) (5 Marks each)	20 Marks
	OR	
QIII B	(Application based/Scenario based Questions) Answer in Detail (Attempt Any Four of Six) (5 Marks each)	20 Marks
QIV	Long Answer Type Question (Any One out of Two)	15 Marks

4.5 Passing Standards

Grade	Marks	Grade Points
O	80 & Above	10
A+	70 to 79.99	9
A	60 to 69.99	8
B+	55 to 59.99	7

B	50 to 54.99	6
C	45 to 49.99	5
D	40 to 44.99	4
F	Less than 40	0

- The learners shall obtain a minimum of 40% marks (i.e. 16 out of 40) in the Continuous Internal Evaluation (CIE) and 40% marks in Semester End Examination (i.e. 24 out of 60) separately, to pass the course and a minimum of Grade D to pass a particular semester.
- Learners who fail to clear Class Test I or were unable to appear for Class Test I on account of Medical grounds, Bereavement of a family member, Internships/Training or Positioned at Events by the College can appear for Class Test II
- If just prior to or during the CIE a bereavement (of an immediate family member) occurs. (Note: In this case the Death Certificate of the departed and the Parent's note will have to be given to the College within 2 days of returning to College, for this clause to hold).
- A learner will be said to have passed the course if the learner passes the Continuous Internal Evaluation (CIE) and Semester End Examination.

4.6 ATKT in Class Test

Students failing to clear the Class Test will have to submit a project on a topic approved by the subject teacher.

The allocation of marks will be as follows:

- Written Assignment – 10 marks
- Presentation- 5 marks

4.7 Approved Certifications for Additional Credits

Attending National Conference	1 Credit
Attending International Conference	2 Credits
Presentation of Paper in National Conference	2 Credits
Presentation of Paper in International Conference in India	2 Credits
Presentation of Paper in International Conference in any other country	4 Credits
Online Certification in relevance to the areas of Nutrition and Dietetics (Coursera/Udemy) 60 Hours	4 Credits

All M.Sc. in Integrative Nutrition & Dietetics students graduating will have the option to earn maximum upto 8 (eight) additional credits. Students can earn these credits anytime during the Programme.

4.8 Semester Abroad Programme

Students who are allowed to undergo internship or training in Industries in India or abroad during their course work or attend any National / International Institute under semester abroad programme (SAP) up to a maximum of 1 semesters will be granted credit equivalence for the Course Work/Project Work done by them in the Industry /Foreign Institute as per the recommendations of the Equivalence committee.

4.9 Eligibility for Faculty

Master 's degree with 55% marks (or an equivalent grade in a point scale wherever grading system is followed) in a relevant/allied subject OR Relevant work experience in the industry or related areas.

5. Teaching Methodology

1. Classroom Sessions

- **Lectures:** Lectures shall be delivered by experienced faculties along with visiting faculties and experts from the Industry in online/offline or blended mode.
- **Assignments & Projects:** Shall be assigned at regular intervals of the course. It offers an opportunity for students to meet, interact and collaborate with experienced people from the industry.
- **Knowledge Workshops and Industry Seminars:** Shall be organized at regular intervals to keep the students informed about the latest developments in the Nutrition & Dietetics Industry. These workshops are uniquely designed with a focus on practical industry – relevant topics.

2. Guest Lectures And Case Studies

- **Guest Lecture:** Eminent people from the Nutrition & Dietetics industry shall be invited as guest speakers to impart lessons and their rich experiences on various fields related to this industry to the students. They also focus on imparting training around management concepts that have today become essential skills to carve a niche in the industry.
- **Case Studies:** Case studies highlighting various practical and situational issues shall be regularly discussed during classroom sessions. The discussion caters towards identifying what went wrong in the case and what could have been done in a better manner, this helps train students to handle such situations in the future. The exercise also improves the analyzing and analytical capabilities of our students.

3. Innovative & Interactive Learning Technology

- **Educational wikis:** It keeps track of education-oriented wikis, establishes constructive interactions with them, and researches their technology, activity, culture, processes, and impact.
- **Creative Presentation Ideas:** Gone are the days when Microsoft Presentation was the only means to make academic training interactive and engaging. Enliven your material and engage the students with these simple and easy to implement methodologies:
 - **Prezi Presentation:** Prezi is a powerful communication and presentation tool that aims to replace PowerPoint presentation. Equipping students with the knowledge of this tool helps in preparing them to adapt easily to the ever-changing dynamics of the corporate world.
- **CREATE through Technology:**

- **YouTube Broadcasting:** Harness the power of YouTube as an effective broadcasting medium to create and share your ideas and thoughts with diverse audiences.
- **Communication and Collaboration:** Google Apps provides students a chance to learn how to use webmail services, calendar (shared calendaring), G-Talk (instant messaging and voice/video chat) and Drive (online document creation & sharing).
- **Education through Blogs:** A powerful and interactive medium for learning. Ideal to educate, discuss and share innovative ideas across a large and diverse set of audiences.

4. Unparalleled Internships & Practical Training

- **Internships & Practical Training:** These internships and training act like great learning platforms giving them the live experience of managing a case.
- **In-House Projects:** Students shall be provided with an opportunity to work on in-house projects right from the start to finish, to provide them with hands-on experience, which helps them to gain excellent Nutrition & Dietetics skills.

6. Ad-hoc Board of Studies

Following Academicians, Faculty members & Experts have been consulted for the contents and development of the Syllabus for this course:

- Principal Dr. (Mrs.) Ancy Jose- Principal, Khandwala College
- CA Dr. Varsha Ainapure – M Com., FCA, Ph.D., Post-Doc (USA), Adjunct Professor, Khandwala College
- Mr. Vipul Solanki, MMS
- Ms. Sneha Asar, MBA
- Ms. Hemali Malavia, M.Sc. - Faculty
- Dr. Akshat Chaddha, Industry Representative
- Ms. Hardika Vira, Industry Representative

M.Sc. in Integrative Nutrition & Dietetics

Two Year Integrated Programme

Four Semesters

Basic Structure: Distribution of Courses

1	Skill Enhancement Compulsory Course (SEC)	6 Papers of 2 Credits Hrs. each (Total Credits Hrs. 6*2)	12
2	Core Course (CC)	12 Papers of 4 Credits Hrs. each (Total Credits Hrs. 12*4)	48
3	Core Course - Practical (CC-P)	4 Papers of 2 Credits Hrs. each (Total Credits Hrs. 4*2)	8
4	Discipline Specific Compulsory Course (DSC)	7 Papers of 4 Credits Hr. each (Total Credits Hrs. 7*4) 1 Papers of 2 Credits Hr. each (Total Credits Hr. 1*2) 1 Papers of 6 Credits Hr. each (Total Credits Hr. 1*6)	36
	Total Credits Hrs		104

M.Sc. in Integrative Nutrition & Dietetics
Under Choice Based Credit, Grading and Semester System
Curriculum Framework
FIRST YEAR

Sr. No	Semester I	Subject code	Credits	Sr. No	Semester II	Subject code	Credits
	<i>Core Course (CC)</i>				<i>Core Course (CC)</i>		
1	CC-1 Lifecycle Nutrition	2111PSNDLN	4	1	CC-4 Therapeutic Diet	2121PSNDTD	4
2	CC-2 Food Science - I	2112PSNDFS	4	2	CC-5 Food Science II	2122PSNDFS	4
3	CC-3 Food Processing & Preservation - I	2113PSNDFP	4	3	CC-6 Food Processing & Preservation - II	2123PSNDFP	4
	<i>Core Course - Practical (CC-P)</i>				<i>Core Course - Practical (CC-P)</i>		
4	CC-P-1 Practical - I	2114PSNDPR	2	4	CC-P-3 Food Science - II (Practical)	2124PSNDFS	2
5	CC-P-2 Practical - II	2115PSNDPR	2	5	CC-P-4 Food Processing & Preservation (Practical)	2125PSNDFP	2
	<i>Discipline Specific Compulsory Course (DSC)</i>				<i>Discipline Specific Compulsory Course (DSC)</i>		
6	DSC-1 Human Anatomy - I	2116PSNDHA	4	6	DSC-3 Human Anatomy - II	2126PSNDHA	4
7	DSC-2 Biochemistry - I	2117PSNDBC	4	7	DSC-4 Human Nutrition	2127PSNDHN	4
	<i>Skill Enhancement Compulsory Course (SEC)</i>				<i>Skill Enhancement Compulsory Course (SEC)</i>		
8	SEC-1 Sanskrit/ Allied / Other related course	2118PSNDSA	2	8	SEC-2 Sanskrit/ Allied / Other related course	2128PSNDSA	2
	TOTAL		26		TOTAL		26

SECOND YEAR

Sr. No.	Semester III	Subject code	Credits	Sr. No.	Semester IV	Subject code	Credits
	<i>Core Course (CC)</i>				<i>Core Course (CC)</i>		
1	CC-7 Disease Management through Nutrition - I	2231PSNDDM	4	1	CC-10 Nutrigenetics	2241PSNDNG	4
2	CC-8 Immunology	2232PSNDIM	4	2	CC-11 Disease Management through Nutrition - II	2242PSNDM	4
3	CC-9 Alternative Health Strategies & Therapies	2233PSNDHT	4	3	CC-12 Lifestyle Pillars	2243PSNDLP	4
	<i>Discipline Specific Compulsory Course (DSC)</i>				<i>Discipline Specific Compulsory Course (DSC)</i>		
4	DSC-5 Food Psychology	2234PSNDFP	4	4	DSC- 8 Public Health Nutrition	2244PSNDPH	4
5	DSC-6 Sports Nutrition	2235PSNDSN	4	5	DSC-9 Dissertation	2245PSNDT	6
6	DSC-7 Research Methodology & Bio Statistics	2236PSNDRB	2				
	<i>Skill Enhancement Course (SEC)</i>				<i>Skill Enhancement Course (SEC)</i>		
7	SEC-3 Communication & Counseling Skills	2237PSNDCC	2	6	SEC-5 Entrepreneurship & Management	2246PSNDEM	2
8	SEC-4 Sanskrit/ Allied / Other related course	2238PSNDSA	2	7	SEC-6 Sanskrit/ Allied / Other related course	2247PSNDSA	2
	TOTAL		26		TOTAL		26

The syllabus can be updated/revised/modified from time to time to meet industry requirements.

Nagindas Khandwala College (Autonomous)

**Syllabus and Question Paper Pattern
of Courses of**

M.Sc. in Integrative Nutrition & Dietetics

**First Year
*Semester I and II***

Under Choice Based Credit, Grading and Semester System

***Syllabus of Courses of
M.Sc. in Integrative Nutrition & Dietetics
at Semester I***

1. Lifecycle Nutrition

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Standardization and Meal Planning	15
Module 2	Prenatal to Lactation	15
Module 3	Infancy to Adolescence	15
Module 4	Geriatric nutrition	15
	Total	60

Course Objectives

1. To discuss, contrast, and evaluate the roles of nutrition and wellness within the complex processes of pregnancy, lactation, child development, and aging.
2. To distinguish, adapt, and design nutrition and wellness interventions which integrate the social-psychological influences on maternal and child development and aging to food intake, nutritional status, and overall wellness.

Course Outcomes

After successful completion of the course the learner will be able to:

1. Determine the nutrition and diet requirements in various stages of life.
2. Recognize the geriatric nutrition deficiency issues and considerations.

Detailed Syllabus

Module	Topics	No. of Lectures
1	Standardization and Meal Planning	15
	<ul style="list-style-type: none"> ● Basic concepts of cooking ● Standardization and Meal planning ● Reading reports and interpretation of reports for each clinical condition 	
2	Prenatal to Lactation	15
	<ul style="list-style-type: none"> ● IVF, IUD, IUI- pros and cons ● Different procedures for conceiving ● Factors that impact conception, physiological and psychological changes, vitamins and minerals of interest, ● Macronutrients of nutrients and micronutrients of interest during all 3 cycles ● Superfoods of interest for preconception, pregnancy and lactation 	
3	Infancy to Adolescence	15
	<ul style="list-style-type: none"> ● Infancy to Adolescence - Dietary modification, Diet planning, and Preventive measures for - PEM, Iron deficiency anemia and Vitamin A deficiency ● Rickets- superfoods of interest, weaning foods, vitamins and minerals of interest during growth and development ● Challenges faced in adolescence physiological and psychological changes in adolescence 	
4	Geriatric nutrition	15
	<ul style="list-style-type: none"> ● Geriatric nutrition- issues- physiology- Parkinson's, Alzheimer's, superfoods of interest, dentures ● Impact of age on blood pressure, challenges faced, diet planning, soft diet, the impact of age on emotions 	

Reference Books

1. Rajammal P. Devadas and Jaya Muthu, (1996): A text book of Child Development, Macmillan, N.Delhi.
2. Hurlock E.B., (1972): Child development, McGraw Hill Book Company.
3. Suriakanthi A., (1997): Child Development - An Introduction, Kavitha Publishers.
4. Hurlock,E.B., (1995): Developmental Psychology-A life span approach, 5th Edition, McGraw Hill Book Co., New York.
5. Nanda V.K., (1998): Principles of Child Development, Anmol Publications Pvt. Ltd., New Delhi.
6. Berk L.E., (2004): Child Development, Pearson Longman New Delhi.

***Syllabus of Courses of
M.Sc. in Integrative Nutrition & Dietetics
at Semester I***

2. Food Science - I

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Food Science and Water	15
Module 2	Whole Grains	15
Module 3	Fats	15
Module 4	Plant antioxidants and Fiber	15
	Total	60

Course Objectives

1. To understand the chemistry of food components like proteins, carbohydrates and lipids.
2. To understand the structure and nutritive value, understand the processing factors and acquire skills in preserving nutrients and pigments in the processing and storage of vegetables and fruits.

Course Outcomes

After successful completion of the course the learner will be able to:

1. Analyze the various food components and its nutritional value.
2. Process and preserve food materials in a methodological and coherent manner.

Detailed Syllabus

Module	Topics	No. of Lectures
1	Food Science and Water	15
	<ul style="list-style-type: none"> ● Food Science and Water- Introduction to food science, water ● RO, Kangen, alkaline water 	
2	Whole Grains	15
	<ul style="list-style-type: none"> ● Whole Grains- types of grains, composition in nutritive value and classification, structure, processed / refined/ polished grains ● Toxin constituents of pulses, types of cereals and pulses - its impact on satiety, its role as macronutrient 	
3	Fats	15
	<ul style="list-style-type: none"> ● Fats- Types, Sources, Daily allowance, e.g. Oils, Different types of Nuts n seeds- composition n nutritive value and classification ● Structure- almonds, walnuts, flaxseeds, pumpkin seeds, sunflower seeds, peanuts, brazil nuts, pecans 	
4	Plant Antioxidants and Fiber	15
	<ul style="list-style-type: none"> ● Plant antioxidants and fiber- Fruits n veggies - different colored fruits and the antioxidant compound ● Composition and nutritive value and classification, structure- types of veggies- Type A, B, C, fiber content, its impact on satiety and gut health, types of fiber, benefits of fiber. 	

Reference Books

1. Potter, N. and Hotchkiss, J.H. Food Science, 5th Ed., CBS Publications and Distributors, Daryaganji, New Delhi, 1998.
2. Shakuntala Manay, Shadaksharaswamy. M (2000) Foods, Facts and Principles, New Age International Pvt Ltd Publishers, 2nd Edition
3. Usha Chandrasekhar, Food Science and Application in Indian Cookery, Phoenix Publishing House P. Ltd., New Delhi, 2002.
4. Srilakshmi, B. Food Science, New Age International Publishers, New Delhi, 2010
5. Swaminathan, M, Handbook of Food Science and Experimental Foods, BAPPCO, Bangalore, 1992
6. Brow, A., Understanding Food, Thomson Learning Publications, Wadsworth, 2000.
7. Mehas, K.Y. and Rodgers, S.L. Food Science and You, McMillan McGraw Company, New York, 2000.
8. Parker, R. Introduction to Food Science, Delmer, Thomson Learning Co., Delma, 20

***Syllabus of Courses of
M.Sc. in Integrative Nutrition & Dietetics
at Semester I***

3. Food Processing and Preservation-I

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Introduction to Food Processing and Preservation	15
Module 2	Food Microbiology and Food Spoilage	15
Module 3	Processing of Cereals and Millets	15
Module 4	Processing of Milk and Milk Products	15
	Total	60

Course Objectives

1. To gain knowledge in food processing and food conservation
2. To understand the principles of food processing
3. To understand the food processing techniques of various food groups

Course Outcome

After successful completion of the course the learner will be able to:

1. Gain knowledge in food processing and food conservation
2. Understand the factors that affect food microbiology and food spoilage

Detailed Syllabus

Module	Topics	No. of Lectures
1	Introduction to Food Processing and Preservation	15
	<ul style="list-style-type: none"> ● Nature and properties of food, fluid and visco elastic behavior of foods ● Principles of different food processing. Effect of food processing on nutritional properties of food ● Importance of food processing- industrial structure, different processes, its impact on nutrition, Hygiene quality wrt to food processing, Standards and laws related to food industry 	
2	Food Microbiology and Food Spoilage	15
	<ul style="list-style-type: none"> ● Food microbiology and food spoilage: food borne bacteria, moulds, yeast ● Methods for detection of microorganisms in food- meat, dairy, sea foods, vegetables etc. 	
3	Processing of Cereals and Millets	15
	<ul style="list-style-type: none"> ● Milling products and by products of wheat, rice, corn, barley, oats, sorghum and other millets, whole wheat atta, blended flour, fortified flour, flaked, puffed and popped cereals, malted cereals, ● Processed foods - bakery products, pasta products and value-added products, use of leavening agents, emulsifiers, improvers in baking, its impact on nutritive values of grains and side effect on human anatomy 	
4	Processing of Milk and Milk Products	15
	<ul style="list-style-type: none"> ● Milk – manufacture of different types of milk, drying of whole and skim milk, cream separation, churning of butter, processing of different types of cheese ● Probiotic milk products - yoghurt, curd, ice-cream, indigenous milk products - khoa, kalakand, channa, paneer ● Impact of processes on nutritive value of milk 	

	<ul style="list-style-type: none"> • Different processing methods, homogenisation, pasteurisation, toned milk, skim milk, double toned milk 	
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Reference Books

1. Shakuntala Manay, N. and Shadaksharaswamy, M., Foods – Facts and Principles, New Age International (P) Limited Publishers, New Delhi, 2003.
2. Sivasankar B, Food Processing and Preservation, Prentice – Hall of India Private Ltd., New Delhi, 2002.
3. Bawa AS, Raju PS, Chauhan OP, Food Science, New India Publishing Agency, New Delhi, 2013.
4. Srilakshmi, N., Food Science, New Age International Private Ltd., New Delhi, 2002.
5. Swaminathan, M., Food Science, Chemistry and Experimental Foods, Bappco Publishers, Bangalore, 2004.
6. Chandrasekhar, U, Food Science and Applications in Indian Cookery, Phoenix Publishing House Private Ltd., New Delhi, 2002
7. Fellow, P., Food Processing Technology – Principles and Practices, 3rd Edition, CRC Press Woodland Publishers, England, 2009.
8. Adams, M.R. and Moss, M.O., Food Microbiology, New Age International (P) Ltd., New Delhi, 2005

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4. Practicals – I

Modules at a Glance

Practicals

1. Derivation of exchange list
2. Standardisation of different food groups
3. Standardisation of cooked food
4. Meal planning for:
 - Preconception
 - Pregnancy - Trimester I, II and III
 - Lactation
 - Weaning, infancy and kids
 - Adolescence
 - Geriatrics
5. Cooking practicals for:
 - Preconception
 - Pregnancy - Trimester I, II and III
 - Lactation
 - Weaning, infancy and kids
 - Adolescence
 - Geriatrics
6. Demonstration of different cooking techniques

Course Objectives

1. Discuss, contrast, and evaluate the roles of nutrition and wellness within the complex processes of pregnancy, lactation, child development, and aging.
2. Distinguish, adapt, and design nutrition and wellness interventions which integrate the social-psychological influences on maternal and child development and aging to food intake, nutritional status, and overall wellness.

Course Outcome

After successful completion of the course the learner will be able to:

1. Determine the nutrition and diet requirements in various stages of life.

2. Recognize the geriatric nutrition deficiency issues and considerations.

Reference Books

1. Rajammal P. Devadas and Jaya N.Muthu, (1996): A text book of Child Development, Macmillan, N.Delhi.
2. Hurlock E.B., (1972): Child development, McGraw Hill Book Company.
3. Suriakanthi A., (1997): Child Development - An Introduction, Kavitha Publishers.
4. Hurlock,E.B., (1995): Developmental Psychology-A life span approach, 5th Edition, McGraw Hill Book Co., New York.
5. Nanda V.K., (1998): Principles of Child Development, Anmol Publications Pvt. Ltd., New Delhi.
6. Berk L.E., (2004): Child Development, Pearson Longman New Delhi.

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**5. Practical II
Modules at a Glance**

1. Estimation of serum iron
2. Demonstration- ESR, differential blood count
3. Estimation of carbohydrate
4. Estimation of protein
5. Qualitative analysis of fats
6. Qualitative analysis of proteins
7. Impact of hot and cold temperatures on food borne bacteria

Course Objectives

1. Understand the lipid metabolism and its regulation
2. Correlate the action of hormones with metabolic regulation
3. Learn the principles of spectrophotometry

Course Outcome

After successful completion of the course the learner will be able to:

1. Understand the enzymes, their types, enzyme activity and their diagnostic role
2. Have coherent and systematic knowledge on carbohydrate metabolic regulation
3. Understand the principles of spectrophotometry.

Reference Books

1. J. L. Jain, Sunjay Jain and Nitin Jain, Fundamentals of Biochemistry Publishers: S. Chand & Co Ltd, 2008.
2. Ambika Shanmugam, Fundamentals of Biochemistry for Medical Students, 7th Edition, Lippincott Williams and Wilkins, 2012.
3. Jeremy M. Berg, John L. Tymoczko, Lubert Stryer, Biochemistry, Palgrave MacMillan; 7th revised international edition, 2011
4. Victor Rodwell, David Bender, Kathleen M. Botham, Peter, J.Kennelly, P.Anthony Weil, Harpers Illustrated Biochemistry, McGraw-Hill Education / Medical; 30 edition, 2015
5. David L, Nelson, Michael M, Cox, Lehninger's Principles of Biochemistry, W. H. Freeman; 5th edition, 2008

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6. Human Anatomy - I

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Human Anatomy & Mitochondria	15
Module 2	Circulatory system – Blood and Heart	15
Module 3	Respiratory and Reproductive System	15
Module 4	Urine System, Endocrine and Exocrine	15
	Total	60

Course Objectives

1. To enable the learners to understand the current state of knowledge about the functional organization of the human body.
2. To help the learners understand the principles of blood and circulatory systems

Course Outcome

After successful completion of the course the learner will be able to:

1. Develop the insight of normal functioning of all the organ systems of the body and their interactions.
2. Interpret the mitochondria, blood and circulatory systems.

Detailed Syllabus

Module	Topics	No. of Lectures
1	Human Anatomy & Mitochondria	15
	<ul style="list-style-type: none"> ● Human Physiology - Concept of anatomy and physiology, medical terminologies, overview of different systems, cells tissues organ level organization ● Mitochondria - Structure, Function, Impact on weight gain and loss, Impact of neurotransmitters on mitochondrial function, Superfoods to boost mitochondrial function, Factors that impact mitochondria 	
2	Circulatory System – Blood and Heart	15
	<ul style="list-style-type: none"> ● Blood - Functions and Properties of blood, Blood components, Physical characteristics of blood, Formation of blood cells, RBC< WBC morphology, Types functions, Stem cell transplant, Blood clotting, Homeostasis, Blood Groups and Types, Structure and Function of blood ● Heart - Anatomy of heart, Heart valves and Circulation of blood, Arteries, Hemodynamics, Blood pressure and blood flow, Cardiac cycle, Cardiac output, Exercise and Heart, Circulatory system, shock and Homeostasis, Aging and Cardiovascular System 	
3	Respiratory and Reproductive System	15
	<ul style="list-style-type: none"> ● Respiratory- anatomy, pulmonary ventilation, lung volume and capacity, exchange of gases, transport of gases, control of respiration, exercise and respiratory system, development of the respiratory system, aging and respiratory system, complications ● Reproductive- male reproductive system - anatomy, spermatogenesis, hormonal control of testes, reproductive system ducts in male's accessory sex gland, Female reproductive system - Anatomy, structure and function, female reproductive cycle, birth control method, abortion, development of reproductive system, aging and reproductive system 	

4	Urine System, Endocrine and Exocrine	15
	<ul style="list-style-type: none"> ● Urinary System- anatomy and histology of kidneys, overview of renal physiology, tubular reabsorption and tubular secretion, production of dilute and concentrated urine, evaluation of kidney function, urine transportation, storage and elimination, aging and urinary system 	

Reference Books

1. Meyer B J, Meij H S and Meyer A C., Human Physiology, AITBS Publishers and Distributors.
2. Wilson, K.J.W and Waugh, A. (1996): Ross and Wilson, Anatomy and Physiology in Health and Illness, 8th Edition, Churchill Livingstone.
3. Ranganathan, T.S. (2004): A Textbook of Human Anatomy, Chand & Co. N. Delhi.
4. Jain, A.K., Textbook of Physiology, Vol. I and II, Avichal Publishing Co., New Delhi.
5. Chatterjee C.C. (1987): Human Physiology, Vol. I & II, Medical Allied Agency, Calcutta.
6. Guyton, A.G. and Hall, J.B. (1996): Textbook of Medical Physiology, (9th Edition, W.B. Sanders Company, Prism Books (Pvt.) Ltd., Bangalore.

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7. Biochemistry I

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Carbohydrate	15
Module 2	Protein	15
Module 3	Lipid	15
Module 4	Nucleotides, Nucleic Acids and Enzymes	15
	Total	60

Course Objectives

1. To understand the lipid metabolism and its regulation
2. To correlate the action of hormones with metabolic regulation.

Course Outcome

After successful completion of the course the learner will be able to:

1. Understand the enzymes, their types, enzyme activity and their diagnostic role
2. Develop coherent and systematic knowledge on carbohydrate metabolic regulation

Detailed Syllabus

Module	Topics	No. of Lectures
1	Carbohydrate	15
	<ul style="list-style-type: none"> ● Monosaccharides: types, characteristics and properties; disaccharides, oligosaccharides, polysaccharides – biological significance, Carbohydrate metabolism ● Metabolic Pathway - Glycolysis, TCA cycle, HMP shunt, Glyoxylate cycle. ● Gluconeogenesis from TCA intermediates / amino acids / acetyl-CoA, concept of Glycogenesis and glycogenolysis. Biosynthesis of polysaccharides and sugar ● Interconversions - importance of carbohydrates wrt energy, impact of carbohydrate on gut health and brain health 	
2	Protein	15
	<ul style="list-style-type: none"> ● Amino acids: classification, structure, properties, Protein structure: peptide linkage, covalent backbone, three-dimensional conformation; quaternary structure of oligomeric proteins. Determination of -N and -C terminal amino acids, Protein functions. Metabolism – Synthesis of protein and metabolism of amino acids ● Muscle growth, hormones, enzyme, Complete protein wrt to growth and multiplication 	
3	Lipid	15
	<ul style="list-style-type: none"> ● Classification, structure, properties; biological significance. ● Bioenergetics – electron transport and oxidative phosphorylation, redox potential, high energy compounds ● ATP and significance, Lipid metabolism - beta oxidation of fatty acids, Biosynthesis of fatty acids ● Side effects of PUFA, its impact on inflammation, omega 3 and 6 - its pros, cons and usage, its impact on immunity, gut, liver and brain health (ketone formation) 	
4	Nucleotides, Nucleic Acids and Enzymes	15

	<ul style="list-style-type: none"> ● Structure of Purine and pyrimidine nucleotides: double helical structure of DNA and RNA, ● Biosynthesis and catabolism of purine and pyrimidine nucleotides. Transcription, translation ● Definition, IUPAC classification of enzymes, factors affecting enzyme activity, ● Chemical pollutants, mutation and deficiency of micronutrients on Replication (growth cycle) 	
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Reference Books

1. J. L. Jain, Sunjay Jain and Nitin Jain, Fundamentals of Biochemistry Publishers: S. Chand & Co Ltd, 2008.
2. Ambika Shanmugam, Fundamentals of Biochemistry for Medical Students, 7th Edition, Lippincott Williams and Wilkins, 2012.
3. Jeremy M. Berg, John L. Tymoczko, Lubert Stryer, Biochemistry, Palgrave MacMillan; 7th revised international edition, 2011
4. Victor Rodwell, David Bender, Kathleen M. Botham, Peter, J.Kennelly, P.Anthony Weil, Harpers Illustrated Biochemistry, McGraw-Hill Education / Medical; 30 edition, 2015
5. David L, Nelson, Michael M, Cox, Lehninger's Principles of Biochemistry, W. H. Freeman; 5th edition, 2008.

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8. Sanskrit/ Allied/ Other related courses

Sr.	Modules/Units
1	Word Class Articles, Prepositions, Verbs, Adverbs, Conjunctions, Interjections
2	Tenses, Concord, Voice Tense and Aspect, Subject and Verb Agreement, Person and Number, Active and Passive Voice
3	Spelling and Punctuation Rules of Punctuation, Basic Rules of Spelling
4	Sentences Types of Sentences, Conversion of Sentences

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1. Therapeutic Diet

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Principles of Nutrition Care	12
Module 2	Infections, Fevers, Food Allergy	12
Module 3	Etiology, Clinical features and nutritional management	12
Module 4	Diseases of the Gastrointestinal Tract	12
Module 5	Diseases of the liver, Gall bladder and Exocrine pancreas	12
	Total	60

Course Objectives

1. To learn the principles of dietary counseling.
2. To enable the learners to correlate the diet with infections and diseases.

Course Outcome

After successful completion of the course the learner will be able to:

1. Gain knowledge about causative factors and metabolic changes in various diseases/disorders and the associated principles of diet therapy.
2. Recognize significance of etiology, clinical features and nutritional management in diet therapy

Detailed Syllabus

Module	Topics	No. of Lectures
1	Principles of Nutrition Care	12
	<ul style="list-style-type: none"> ● Nutrition Care Process - Therapeutic adaptations of the normal diet, Progressive diets – clear fluid, full fluid, soft and regular ● Definition of Dietetics, dietitian, Goals of Diet Therapy ● Types of dietitian, role and responsibilities of dietitians, qualification, qualities and professional ethics, code of conduct. ● Specially modified therapeutic diets, High calorie low calorie, high and low protein, bland, high and low residue diets. ● Special Feeding methods- Enteral nutrition- methods- nasogastric, gastrostomy and jejunostomy types of food, infusion techniques. TPN- Types of infusion, TPN formula for adults. 	
2	Infections, Fevers, Food Allergy	12
	<ul style="list-style-type: none"> ● Etiology, Clinical features and Nutritional management of Infections and Fevers, Reading reports for each condition - <ul style="list-style-type: none"> ○ Typhoid ○ Tuberculosis ○ HIV ○ GI Tract Disorders: ○ Diarrhea ○ Constipation ○ Acidity- medication- side effects. ○ Liver: Infective Hepatitis ● Food allergy and food intolerance ● Etiology, clinical features, diagnosis and nutritional management - Lactose intolerance, gluten intolerance, igG, igE with respect to gut 	
3	Etiology, clinical features and nutritional management	12

	<ul style="list-style-type: none"> ● Weight Imbalances-Overweight and obesity; Underweight ● Eating disorder- anorexia nervosa and bulimia ● Metabolic syndrome- causes, symptoms, classic features, medical nutritional therapy, lifestyle management 	
4	Diseases of the Gastrointestinal Tract	12
	<ul style="list-style-type: none"> ● Diseases of the gastrointestinal tract: Causes, pathogenesis, dietary modification and diet planning for <ul style="list-style-type: none"> ○ GERD and Gastritis ○ Peptic ulcer and hemorrhoids ○ SIBO, Hpylori ○ IBS and IBD 	
5	Diseases of the liver, Gall bladder and Exocrine pancreas	12
	<ul style="list-style-type: none"> ● Diseases of the liver, Gall bladder and Exocrine pancreas – pathogenesis, causes, signs and symptoms, dietary modification and diet planning for: <ul style="list-style-type: none"> ○ Liver- fatty liver, hepatitis- A, B, C, fulminant hepatitis, cirrhosis- alcoholic, nonalcoholic, hepatic encephalopathy- hepatic coma, End stage liver disease ○ Gallbladder – cholecystitis, cholelithiasis ○ Pancreas – pancreatitis- acute and chronic 	

Reference Books

1. Khanna K, Gupta S, Seth R, Passi SJ, Mahna R, Puri S (2013). Textbook of Nutrition and Dietetics. Phoenix Publishing House Pvt. Ltd.
2. Mahan L K and Escott Stump S (2013). Krause's Food & Nutrition Therapy, 13th ed. Saunders-Elsevier.
3. Stacy Nix (2009). William's Basic Nutrition and Diet Therapy, 13th Edition. Elsevier Mosby.

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2. Food Science II

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Animal Protein Part I - Milk and Egg	12
Module 2	Animal Protein Part II - Fish and Meat	12
Module 3	Super Foods	12
Module 4	Refined Sugar	12
Module 5	Food – Drug interaction	12
	Total	60

Course Objectives

1. To help learners understand the chemistry of food components like proteins, carbohydrates and lipids.
2. To enable the learners to understand the concept of food-drug interaction.

Course Outcome

After successful completion of the course the learner will be able to:

1. Analyze and interpret various food components, their types, structure, classification and significance.

Detailed Syllabus

Module	Topics	No. of Lectures
1	Animal Protein Part I - Milk and egg	12
	<ul style="list-style-type: none"> ● Milk- nutritive value, types of milk importance of milk and milk products paneer, cheese, khoa, in our diet ● Egg - Structure, composition, uses in diet 	
2	Animal Protein Part II - Fish and Meat	12
	<ul style="list-style-type: none"> ● Fish and meat - Types of fish and meat, nutritive value, – Curing meat and impact on nutrition. Use of antibiotics and hormones to improve mass production and its impact on human health 	
3	Super Foods	12
	<ul style="list-style-type: none"> ● Super foods- pre-probiotic in detail, microgreens and organic foods, functional foods- spices and condiments, emerging trends in food technology- bio tech, bio fortification, organic foods, GM foods 	
4	Refined Sugar	12
	<ul style="list-style-type: none"> ● Refined Sugar-Nutritive value of refined sugar, empty calories, products high in refined sugar, HFCS, hidden names of sugar, myth, healthy alternatives, ill effects of sugar 	
5	Food – Drug interaction	12
	<ul style="list-style-type: none"> ● Food – Drug interaction ● Impact of protein on drugs, Impact of drug on liver, drug concentration. 	

Reference Books

1. Potter, N. and Hotchkiss, J.H. Food Science, 5th Ed., CBS Publications and Distributors, Daryaganji, New Delhi, 1998.
2. Shakuntala Manay, Shadaksharaswamy. M (2000) Foods, Facts and Principles, New Age International Pvt Ltd Publishers, 2nd Edition
3. Usha Chandrasekhar, Food Science and Application in Indian Cookery, Phoenix Publishing House P. Ltd., New Delhi, 2002.
4. Srilakshmi, B. Food Science, New Age International Publishers, New Delhi, 2010
5. Swaminathan, M, Hand Book of Food Science and Experimental Foods, BAPPCO, Bangalore, 1992
6. Brow, A., Understanding Food, Thomson Learning Publications, Wadsworth, 2000.
7. Mehas, K.Y. and Rodgers, S.L. Food Science and You, McMillan McGraw Company, New York, 2000.
8. Parker, R. Introduction to food Science, Delmer, Thomson Learning Co., Delma, 2000.

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3. Food Processing & Preservation

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Water, Carbohydrates and Starch	15
Module 2	Proteins & Lipids	15
Module 3	Enzymes	15
Module 4	Food Colours and Flavouring Principles in Different Foods	15
	Total	60

Course Objectives

1. To enable the understanding of the chemistry of food components, the chemical and biochemical reactions in foods.
2. To impart a systematic knowledge of basic and applied aspects of food processing and technology.
3. To enable students to become familiar with the quality and safety of food.

Course Outcome

After successful completion of the course the learner will be able to:

1. Gain knowledge in food processing and food conservation
2. Understand the factors that affect food microbiology and food spoilage

Detailed Syllabus

Module	Topics	No. of Lectures
1	Water, Carbohydrates and Starch	15
	<ul style="list-style-type: none"> ● Water: States of water, water activity, water in food preparation. ● Physical aspects of food preparation: energy and food energy transfer, mass transfer, state of matter, dispersions, emulsions, gels, foams. ● Carbohydrates: overview, Sugars-properties of sugars, chemical reactions – Hydrolysis, caramelization, maillard reaction. Food Applications: crystalline candies, crystallization, ripening, syrup, sauces, jams and jellies, sweeteners - types, merits and demerits, safety aspects of sweeteners. ● Starch: structure, functional properties, Gelatinization, pasting, Gelations, syneresis, retrogradation, dextrinization. Factors affecting gelatinization and gelation. Modified starch, resistant starch, Gums – Functions, sources, applications. Pectic substances, pectin gels 	
2	Proteins & Lipids	15
	<ul style="list-style-type: none"> ● Proteins – Overview, hydrolysis, denaturation, Coagulation, Gluten complex development, Gelatin gel, modified meat products, soy proteins, texturised vegetable proteins, non-conventional sources of protein. ● Lipids Overview, crystallinity of solid fats. chemical degradation, oxidative and hydrolytic rancidity, effect of heat, chemical modifications of fats, Hydrogenation, trans fats, functional roles of fats, fat replacements. 	
3	Enzymes	15
	<ul style="list-style-type: none"> ● Enzymes – Enzyme inactivation and control, food modifications using microbial & non microbial enzymes, enzyme browning, enzyme utilization in the food 	
4	Food Colours and Flavouring Principles in Different Foods	15

	<ul style="list-style-type: none"> ● Food colours – Pigments in animal and plant foods, effects of processing, pH and storage on food colours, food colourants- permitted and non-permitted ● Flavouring principles in different foods – flavours of spices, vegetables and fruits, fats and oils, flesh food, milk Artificial flavours 	
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Reference Books

1. Borvers, J. (1992). Food Theory and Application (2ndEd), New York: Maxwell MacMillan International Edition. Manay, N. S. and Sharaswamy, S. M. (1997).
2. Foods: Facts and Principles New Delhi: New Age International Publishers. McWilliams, M (2007).
3. Foods: Experimental Perspectives 5th Ed, New Jersey: Macmillar Publishing Co. Potter, N. N. and Hutchkiss, J. H. (1997).
4. Food Science, 5th Ed, New Delhi: CBS Publishers and Distributors. Rick Parker (2003)
5. Introduction to Food Science, New York: Delmar Thomson Learning. Scottsmith and Hui Y.H (Editors) (2004)
6. Food Processing – Principles and Applications London Blackwell Publishing. Subbulakshmi, G and Udipi, S. A. (2001).
7. Foods Processing and Preservation, New Delhi: New Age International (P) Ltd. Publishing. Swaminathan, M. (1995).
8. Food Science Chemistry and Experimental Food. The Bangalore Printing and Publishing Co. Ltd. Vacklavick, V. and Christian, E. (2003).
9. Essentials of Food Science. New York: Kluwer Academic/ Plenum Publisher.

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4. Food Science - II Practicals

Modules at a Glance

1. Estimation of calcium in food
2. Estimation of iron in food
3. Estimation of vitamin c
4. Estimation of Phosphorous
5. Estimation of potassium

Demonstration

1. Growing microgreens
2. Demonstration of impact of microorganisms on food
3. Impact of heat / cooking on food item
4. Right cooking techniques

Course Objectives

1. To help learners understand the chemistry of food components like proteins, carbohydrates and lipids.
2. To enable the learners to understand the concept of food-drug interaction.

Course Outcome

After successful completion of the course the learner will be able to:

1. Analyze and interpret various food components and their types
2. Understand the structure, classification and significance of various food components.

Reference Books

1. Potter, N. and Hotchkiss, J.H. Food Science, 5th Ed., CBS Publications and Distributors, Daryaganji, New Delhi, 1998.
2. Shakuntala Manay, Shadaksharaswamy. M (2000) Foods, Facts and Principles, New Age International Pvt Ltd Publishers, 2nd Edition
3. Usha Chandrasekhar, Food Science and Application in Indian Cookery, Phoenix Publishing House P. Ltd., New Delhi, 2002.
4. Srilakshmi, B. Food Science, New Age International Publishers, New Delhi, 2010
5. Swaminathan, M, Hand Book of Food Science and Experimental Foods, BAPPCO, Bangalore, 1992
6. Brow, A., Understanding Food, Thomson Learning Publications, Wadsworth, 2000.
7. Mehas, K.Y. and Rodgers, S.L. Food Science and You, McMillan McGraw Company, New York, 2000.
8. Parker, R. Introduction to food Science, Delmer, Thomson Learning Co., Delma, 2000.

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5. Food Processing & Preservation Practical's

Modules at a Glance

1. Field visit to food industry
2. Market survey for all packaged food items with quality of material used in the packaging and their ill effects on human body and environment

Course Objectives

1. To abet learners with various food preservation methods and techniques.
2. To help the learners understand various practices of food adulteration and methods of food packaging.
3. To understand about various food additives and fortifications.

Course Outcome

After successful completion of the course the learner will be able to:

1. Examine the different preservation techniques used in the industry
2. Understand food adulteration and international standards
3. Understand different forms of food packaging

Reference Books

1. Shakuntala Manay, N. and Shadaksharaswamy, M., Foods – Facts and Principles, New Age International (P) Limited Publishers, New Delhi, 2003.
2. Sivasankar B, Food Processing and Preservation, Prentice – Hall of India Private Ltd., New Delhi, 2002.
3. Bawa AS, Raju PS, Chauhan OP, Food Science, New India Publishing Agency, New Delhi, 2013.
4. Srilakshmi, N., Food Science, New Age International Private Ltd., New Delhi, 2002.
5. Swaminathan, M., Food Science, Chemistry and Experimental Foods, Bappco Publishers, Bangalore, 2004.
6. Chandrasekhar, U, Food Science and Applications in Indian Cookery, Phoenix Publishing House Private Ltd., New Delhi, 2002
7. Fellow, P., Food Processing Technology – Principles and Practices, 3rd Edition, CRC Press Woodland Publishers, England, 2009.
8. Adams, M.R. and Moss, M.O., Food Microbiology, New Age International (P) Ltd., Delhi, 2005

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6. Human Anatomy – II

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Sensory organs, Sensory system and Fluid electrolyte balance	15
Module 2	Nervous system	15
Module 3	Bone and Muscles	15
Module 4	Upper and Lower GI	15
	Total	60

Course Objectives

1. To help learners understand the functioning of Respiratory and Reproductive systems.
2. To enable the learners to recognize the mechanism of urinary, endocrine and exocrine systems.

Course Outcome

After successful completion of the course the learner will be able to:

1. Understand the various systems in the human body and their functioning
2. Interpret the mechanism and complications in various systems.

Detailed Syllabus

Module	Topics	No. of Lectures
1	Sensory organs, Sensory system and Fluid electrolyte balance	15
	<ul style="list-style-type: none"> ● Sensory organs and sensory system- olfaction - sense of smell: anatomy , physiology , olfactory pathway, Gustation - sense of taste- anatomy of taste buds, physiology of gustation, gustatory pathway, Vision : hearing equilibrium, anatomy of ear, structure function, physiology and equilibrium pathways , ageing and special senses , somatic sensations, somatic sensory pathways, integrative functions of cerebrum, disorders , ● Fluid electrolyte balance- Fluid components and fluid balance, source of body water gain and loss, its regulation, electrolytes in body fluid, concentrations, sodium potassium calcium magnesium, bicarbonates, acid base balance action of buffer system, protein buffer system , carbonic acid bicarbonate buffer system, exhalation of CO₂, acid base imbalance respiratory acidosis, metabolic acidosis 	
2	Nervous system	15
	<ul style="list-style-type: none"> ● Overview of nervous system, structure and functions, organisations of nervous system; central and peripheral Nervous system, electrical signals in neurons, signal transmission, Neurotransmitters Neural circuits - regeneration and repair, Disorders ● Brain and Spine: spinal cord- anatomy, spinal nerves, spinal cord physiology, brain organisation protection and blood supply, cerebrospinal fluid, Brain stem, Cerebellum, Functional Organisation of cerebral cortex, Cranial nerves Development of nervous system, Disorders 	
3	Bone and Muscles	15

	<ul style="list-style-type: none"> ● Bone- Bone formation, osteoclast, osteoblast, structure of bones, functions of bones ● Muscles: Types of muscles, Disorders overview of muscular system, muscle metabolism, types of skeletal muscles, development of muscles cardiac muscle tissues, smooth muscle tissues 	
4	Upper and Lower GI	15
	<ul style="list-style-type: none"> ● Upper GI: Overview of digestive system, neural innervation of GI tract, Structure and function of - peritoneum, mouth, pharynx, esophagus, deglutition, stomach ● Lower GI: structure and function of - pancreas, liver and gallbladder, small intestine, large intestine, phases of digestion, homeostasis of imbalance 	

Reference Books

1. Meyer B J, Meij H S and Meyer A C., Human Physiology, AITBS Publishers and Distributors.
2. Wilson, K.J.W and Waugh, A. (1996): Ross and Wilson, Anatomy and Physiology in Health and Illness, 8th Edition, Churchill Livingstone.
3. Ranganathan, T.S. (2004): A Textbook of Human Anatomy, Chand & Co. N. Delhi.
4. Jain, A.K., Textbook of Physiology, Vol. I and II, Avichal Publishing Co., New Delhi.
5. Chatterjee C.C. (1987): Human Physiology, Vol. I & II, Medical Allied Agency, Calcutta.
6. Guyton, A.G. and Hall, J.B. (1996): Textbook of Medical Physiology, (9th Edition, W.B. Sanders Company, Prism Books (Pvt.) Ltd., Bangalore.

***Syllabus of Courses of
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at Semester II***

7. Human Nutrition

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Fat sol Vitamins	15
Module 2	Water sol Vits	15
Module 3	Minerals	15
Module 4	Fluid and Electrolytes	15
	Total	60

Course Objectives

1. To understand Fat sol minerals and vitamins.
2. To help the learners understand the structure, function and sources of fluid and electrolytes.

Course Outcome

After successful completion of the course the learner will be able to:

1. Understand the different types of vitamins and the deficiencies.
2. Identify the types of minerals and the deficiencies.
3. Recognize the different types of Fluids and electrolytes

Detailed Syllabus

Module	Topics	No. of Lectures
1	Fat sol Vitamins	15
	<ul style="list-style-type: none"> ● Fat sol Vitamins - Structure, functions, sources, deficiency and toxicity- A, D, E, K 	
2	Water sol Vits	15
	<ul style="list-style-type: none"> ● Water sol Vits - Structure, functions, sources, deficiency and toxicity- C, B vitamins- B1 to B12 	
3	Minerals	15
	<ul style="list-style-type: none"> ● Minerals - Structure, functions, sources, deficiency and toxicity- Iron, Ca, Ph, Iodine, Zn, Se, Mg, Mn 	
4	Fluid and Electrolytes	15
	<ul style="list-style-type: none"> ● Fluid and Electrolytes - Structure, functions, sources, deficiency and toxicity- Electrolyte deficiency and its impact on health. Dehydration- impact on health, fluid overload- disorder 	

Reference Books

1. J. L. Jain, Sunjay Jain and Nitin Jain, Fundamentals of Biochemistry Publishers: S. Chand & Co Ltd, 2008.
2. Ambika Shanmugam, Fundamentals of Biochemistry for Medical Students, 7th Edition, Lippincott Williams and Wilkins, 2012.
3. Jeremy M. Berg, John L. Tymoczko, Lubert Stryer, Biochemistry, Palgrave MacMillan; 7th revised international edition, 2011
4. Victor Rodwell, David Bender, Kathleen M. Botham, Peter, J. Kennelly, P. Anthony Weil, Harpers Illustrated Biochemistry, McGraw-Hill Education / Medical; 30 edition, 2015
5. David L, Nelson, Michael M, Cox, Lehninger's Principles of Biochemistry, W. H. Freeman; 5th edition, 2008.

***Syllabus of Courses of
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at Semester II***

8. Sanskrit/ Allied/ Other related courses

- Structure of Language
- Nouns and various cases
- Ten conjugations
- Voices
- Causal
- Absolute Locative
- Frequentatives
- Desideratives
- Sandhis
- Compounds
- Gerunds
- Infinitives
- History of Sanskrit Literature

OR

Soft Skills & Personality Development

Module 1-Self Analysis and Goal Setting

Module 2- Attitude and Creativity

Module 3-Motivation and Leadership

Module 4- Time Management and Decision Making

Module 5-Stress Management

Nagindas Khandwala College (Autonomous)

**Syllabus and Question Paper Pattern
of Courses of**

M.Sc. in Integrative Nutrition & Dietetics

**Second Year
*Semester III and IV***

**Under Choice Based Credit, Grading and Semester
System**

***Syllabus of Courses of
M.Sc. in Integrative Nutrition & Dietetics
at Semester III***

1. Disease Management through Nutrition – I

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Diabetes	12
Module 2	Cardiac Disease	12
Module 3	Pulmonary Disease	12
Module 4	Thyroid Disease	12
Module 5	Autoimmune conditions	12
	Total	60

Course Objectives

1. To discuss critically the changes in nutritional requirements in various disease states.
2. To recognize the evidence linking foods, nutrients and dietary patterns to the etiology of major diet-related diseases.

Course Outcome

After successful completion of the course the learner will be able to:

1. Interpret the etiology, clinical features, basic diagnosis and nutritional management in various disease state.
2. Understand the fundamentals of diabetes, cardiac, pulmonary and thyroids diseases

Detailed Syllabus

Module	Topics	No. of Lectures
1	Diabetes	12
	<ul style="list-style-type: none"> ● Type 1 and Type 2 Diabetes Mellitus ● Gestational Diabetes (GDM) ● Latent Autoimmune Diabetes of Adults (LADA) ● Secondary Diabetes 	
2	Cardiac Disease	12
	<ul style="list-style-type: none"> ● Hypertension and Coronary Heart Disease <ul style="list-style-type: none"> ○ AF- Atrial Fibrillation ○ Hypercholesterolemia- Lipid profile, Familial hypercholesterolemia ○ IHD- Ischemic heart disease ○ Cardiac cachexia 	
3	Pulmonary Disease	12
	<ul style="list-style-type: none"> ● Asthma, COPD, Allergic rhinitis, ● ARDS, Bronchitis, laryngeal amyloidosis, Pneumonia, influenza 	
4	Thyroid Disease	12
	<ul style="list-style-type: none"> ● Etiology, clinical features, basic diagnosis and nutritional management of Thyroid gland, ● Hashimotos, graves, Hypo, hyper, thyroiditis 	
5	Autoimmune conditions	12
	<ul style="list-style-type: none"> ● Etiology, clinical features, basic diagnosis and nutritional management of Autoimmune conditions 	

Reference Books

1. Lee RD & Neiman DC. (2009). Nutritional Assessment. 5th Edition. Brown & Benchmark.
2. Mahan, L. K. and Escott Stump. S. (2016) Krause's Food & Nutrition Therapy 14th ed. Saunders-Elsevier
3. Shils, M.E., Shike, M, Ross, A.C., Caballero B and Cousins RJ (2005) Modern Nutrition in Health and Disease. 10th ed. Lipincott, William and Wilkins.
4. Williams, S.R. (2001) Basic Nutrition and Diet Therapy. 11th ed. Times Mirror Mosby College Publishing
5. World Cancer Research Fund & American Institute for Cancer Research (2007) Food, Nutrition, Physical Activity and the Prevention of Cancer- A Global Perspective. Washington E.D. WCRF.

***Syllabus of Courses of
M.Sc. in Integrative Nutrition & Dietetics
at Semester III***

2. Immunology

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Introduction to Immunology	15
Module 2	Humoral Immunity	15
Module 3	Hypersensitivity	15
Module 4	Autoimmune Conditions	15
	Total	60

Course Objectives

1. To help the learners understand the principles of immunology.
2. To determine the factors that causes hypersensitivity and autoimmune conditions.

Course Outcome

After successful completion of the course the learner will be able to:

1. Describe immunological response and how it is triggered and regulated.
2. Describe the roles of the immune system in both maintaining health and contributing to disease.

Detailed Syllabus

Module	Topics	No. of Lectures
1	Immunology	15
	<ul style="list-style-type: none"> ● Immunology: Introduction to immunology – primary line of defence mechanism, ● Surface barriers -Physical or chemical barriers that prevent infection (i.e. skin, tears, mucus, saliva, Gastric acid, etc.), phagocytosis. ● Macrophages, kupffer cells , Inflammation, Inflammatory reflex, Acute-phase proteins, concept of antigen , antibodies 	
2	Humoral immunity	15
	<ul style="list-style-type: none"> ● Humoral immunity - Primary lymphoid organs, secondary lymphoid organs, lymphatic system, complement cascade introduction types of antibodies, graft rejection, bone marrow, thymus, ● Maturation and production of B cells and T cells, types of antibodies, structure function, VDJ chain reaction, MHC - I and II, CD4, CD8, antigen antibody complex 	
3	Hypersensitivity	15
	<ul style="list-style-type: none"> ● Hypersensitivity - antigens, hypersensitivity and allergic response, anaphylactic ● Antibodies, IgE, IgG, IgM, immune complex, types of hypersensitivity, 	
4	Autoimmune conditions	15
	<ul style="list-style-type: none"> ● Autoimmune condition- definition, Type 1 diabetes, Lupus, rheumatoid arthritis, graves, psoriasis, ● Multiple sclerosis, celiac disease, SLE, IBD, leaky gut syndrome, fishnet phenomenon and autoimmune condition , symptoms, causes 	

Reference Books

1. Austrian, S. S., Developmental theories through the life cycle, New York: Columbia University Press, 2013.
2. Berk, L. E. (2009). Development through the lifespan. New Delhi: Pearson Education.
3. Bjorklund, B. R. (2015). The Journey of Adulthood (8th ed.). Pearson.
4. Feldman, R. S. (1997). Development across life span. New jersey: Prentice hall.
5. Kerschner, H. K., & Silverstein, N. M. (2018). Introduction to Senior Transportation Enhancing Community Mobility and Transportation Services. Routledge

***Syllabus of Courses of
M.Sc. in Integrative Nutrition & Dietetics
at Semester III***

3. Alternative Health Strategies & Therapies

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Asanas and Pranayama	15
Module 2	Mudra, Bandhas and Meditation	15
Module 3	Eastern Alternative Health Strategies and Therapies	15
Module 4	Western Alternative Health Strategies and Therapies	15
	Total	60

Course Objectives

1. To recognize the basic concepts of Yoga.
2. To develop skills required to meditate and practice Yoga.

Course Outcome

After successful completion of the course the learner will be able to:

1. Foster harmony in the body, mind, and environment.
2. Develop practices to train the body and mind to self-observe and become aware of their own nature.

Detailed Syllabus

Module	Topics	No. of Lectures
1	Asanas and Pranayama	15
	<ul style="list-style-type: none"> ● Meaning, Definition, Aims, Objective of Hath Yoga and Ashtanga Yoga ● Different types of Asanas with Reference to Hath Pradipika, Gherand Aamhita, Patanjali Yoga Sutras- indications, contraindications ● Pranayama with Reference to Hath Pradipika, Gherand Aamhita, Patanjali Yoga Sutras- different types, indications, contraindications 	
2	Mudra, Bandhas and Meditation	15
	<ul style="list-style-type: none"> ● Concept, Meaning, Application of Mudra and Bandhas. ● Concept, Meaning and Various Techniques of Meditation. 	
3	Eastern Alternative Health Strategies and Therapies	15
	<ul style="list-style-type: none"> ● Yoga ● Mindfulness and meditation ● Laughter therapy ● Acupuncture / acupressure ● Any other 	
4	Western Alternative Health Strategies and Therapies	15
	<ul style="list-style-type: none"> ● Music therapy ● Dance therapy ● Art-based therapy ● Flower Therapy ● Essential oils ● Any other 	

Reference Books

1. Bases of Yoga- Shri Aurbindo
2. Patanjali Yoga Sutra – Gita Press Gorakhpur
3. Swami Niranjanananda Saraswati- Gherand Samhita, Bihar School of Yoga Munger.
4. Swami Digambar & Jha P – Hatha Pradipika kaivalydam Yoga Prakashan, Lonavala, Pune.
5. Saraswati Satyananda, Asana, Pranayama, Mudra Bandha- Bihar School of Yoga Munger.
6. Meditation Techniques of the Buddhist and Taoist Masters – Daniel Odier.

***Syllabus of Courses of
M.Sc. in Integrative Nutrition & Dietetics
at Semester III***

4. Food Psychology

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	The psychology of food choices and eating behavior	15
Module 2	Applications of food psychology for health maintenance and disease prevention	15
Module 3	Psychology of the food and nutrition consumer - I	15
Module 4	Psychology of the food and nutrition consumer - II	15
	Total	60

Course 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

Course Outcome

After successful completion of the course the learner will be able to:

1. Describe the psychology of food choices in relation to eating behavior
2. Relate and apply food psychology for health maintenance and disease prevention

Detailed Syllabus

Module	Topics	No. of Lectures
1	The psychology of food choices and eating behavior	15
	<ul style="list-style-type: none"> ● Models of food choice ● Influences on food choice Biological ● Genetic influences on energy and nutrient intake ● Neurobiology of food intake 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 Influences of Media on food choice ● Food choices across the life span ● Food product development and marketing ideas based on factors affecting choice of foods. 	
2	Applications of food psychology for health maintenance and disease prevention	15
	<ul style="list-style-type: none"> ● Strategies to change dietary behavior ● Optimism and intention ● Strategic automisation ● Using stages of change model to change dietary behavior Applications of food psychology in pediatric population 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. ● Obesity - Behavioural phenotype in obesity, mindful eating 	

	<ul style="list-style-type: none"> ● 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. 	
3	Psychology of the food and nutrition consumer - I	15
	<ul style="list-style-type: none"> ● The psychology of the food shopper ● 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 	
4	Psychology of the food and nutrition consumer - II	15
	<ul style="list-style-type: none"> ● Food trends and the changing consumer ● Consumer attitudes to health ● Factors affecting the consumers healthy food choices Ecological consciousness and sustainability with regard food consumption ● Environmental influences in food purchase. ● Encouraging ethical and sustainable food consumption. ● Food product development and marketing to positively impact nutrition status. 	

Reference Books

1. Booth D.A. (1994). *The Psychology of Nutrition*, Taylor and Francis, UK.
2. Committee on Examination of the Adequacy of Food Resources and SNAP Allotments; Food and Nutrition Board; Committee on National Statistics; Institute of Medicine; National Research Council. Editors: Caswell J. and Yaktine a.(2013).
3. Supplemental Nutrition Assistance Program-Examining the Evidence to Define Benefit Adequacy, National Academies Press (US); Washington (DC). Conner M and Armitage J. (2002).
4. *The social psychology of food*, Open University Press, Mc –Graw Hill Education, UK. Institute of Medicine; Food and Nutrition Board; Board on Children, Youth, and Families; Committee on Food Marketing and the Diets of Children and Youth; McGinnis M, Gootman J., and Kraak V. Editors. (2006).
5. *Food Marketing to Children and Youth- Threat or Opportunity?* National Academic Press. DOI: <https://doi.org/10.17226/11514>. <https://www.nap.edu/read/11514> Layman B. (2012), *A Psychology of Food-More Than a Matter of Tastes*, Springer, Kindle Edition. Mayer E. (2016).
6. *The Mind-Gut Connection: How the Hidden Conversation Within Our Bodies Impacts Our Mood, Our Choices, and Our Overall Health*, Harper Collins Publishers. Mendes R. and Dias E. (2011).
7. *Health Protection, Health Promotion, and Disease Prevention at the Workplace*, Oxford University Press. DOI:10.1093/acprof:oso/9780195380002.003.0018 Ogden J.(2011).
8. *The Psychology of Eating: From Healthy to Disordered Behavior*. John Wiley & Sons Stuckey B. (2012).
9. *Taste What You're Missing: The Passionate Eater's Guide to Why Good Food Tastes Good*, Simon and Schuster Inc, New york. Rankin S.H., Stallings K.D. and London F. (2005)
10. *Patient Education in Health and Illness*, Lippincott Williams & Wilkins, Philadelphia. Shepherd R. and Raats M. (2010).
11. *The Psychology of Food Choice*

***Syllabus of Courses of
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5. Sports Nutrition

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Introduction to Basic Nutrition	15
Module 2	Exercise physiology & Diet Planning	15
Module 3	Hydration and electrolytes	15
Module 4	Fitness assessment	15
	Total	60

Course Objectives

1. To understand the knowledge related to physical fitness, health and nutrition

Course Outcome

After successful completion of the course the learner will be able to:

1. To plan meals for athletes and sportsperson
2. To understand the importance of sports nutrition

Detailed Syllabus

Module	Topics	No. of Lectures
1	Introduction to Basic Nutrition	15
	<ul style="list-style-type: none"> ● Introduction to Basic Nutrition: Role & importance of nutrition, Macronutrients - carbohydrates, proteins fats and water Micronutrients- zinc selenium chromium calcium magnesium iron iodine in detail with regards to exercise ● Supplements - composition of supplements, how and when to use the supplements, Whey-whey protein concentrate, whey protein isolate casein - whey composition / proportion BCAA (Branch Chained Amino Acids), glutamine, creatinine, Steroids, fat burners, NO boosters, - benefits, dosage, side effects ● Antioxidants, natural and supplement form both- Vit C, CoQ10, colostrum, Vit B, D, E, preparing for an event- carbo loading, resting, hydration, supplements to take and avoid before an event 	
2	Exercise physiology & Diet Planning	15
	<ul style="list-style-type: none"> ● Exercise physiology: Musculoskeletal anatomy- strength, power, endurance, overview of aerobic and anaerobic pathway, Effect of training on heart & lung performance, Importance of heart rate monitoring and how do you calculate it ● Diet planning in Sports: Marathon Runs, Cricket etc.: Strength Sports: Boxing, Weightlifting etc., Athletes Diet and eating disorders, Weight maintenance plans 	
3	Hydration and electrolytes	15
	<ul style="list-style-type: none"> ● Hydration and electrolytes- Role of water in energy metabolism, impact of dehydration on cells and hence activity, importance of sodium, potassium, iron calcium and magnesium in exercising individuals' dehydration, heat injury, sports drinks 	
4	Fitness assessment	15
	<ul style="list-style-type: none"> ● Fitness assessment- anthropometric measurements, BMR, factors, measuring Resting Metabolic Rate, Max Heart Rate, Body Mass Index, Body Fat composition, Body composition analysis, endurance difference between subcutaneous and visceral fat, its significance ● Ergonomics and Injury Management- lymphatic drainage, muscle development, impact of exercise on physiology, muscle injury, different exercise 	

Reference Books

1. Havley E. T. and Franks B. D. (1997) Health Fitness instructions handbook. Third edition. Human kinetics Champaign Illinois.
2. Carry Egger, Nigel champion and Allan Bolton compiled buy the fitness header's handbook A& C black London.
3. McArdle, W. D, Frank I. Katch, F. I and Victor L. Katch (1996) Exercise Nutrition: Energy Nutrition and Human Performance. William & Wilkin Publishing USA.
4. Mahan, K and Stump, E. S (1996) Krause Food and Nutrition and Diet Therapy W.B Saunders Company, USA.
5. Uppal. A.K. (2004) Physical Fitness and Wellness Friends publications India.
6. Werner W. K Hoejer (1989), Lifetime Physical Fitness and Wellness, Morton Publishing Company, Colorado.
7. Mishra, S. C (2005) Physiology in Sports. Sports Publication, New Delhi

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6. Research Methodology & Bio Statistics

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Introduction to Research	7
Module 2	Tools of Research	8
Module 3	Statistics	7
Module 4	Writing Research Paper	8
	Total	30

Course Objectives

1. To explain the scope of biostatistics and research work
2. To understand calculation and presentation of the data
3. To gain insights on how to present the research work writing and correlate it.

Course Outcome

After successful completion of the course the learner will be able to:

1. Understand the Biostatistics arrangement, presentation and formation of tables and charts.
2. Gain the knowledge about the correlation and regression & application of different methods and analysis of data
3. Write dissertation, thesis and research paper.

Detailed Syllabus

Module	Topics	No. of Lectures
1	Introduction to Research	15
	<ul style="list-style-type: none"> ● Meaning of research, importance and types of research B. ● Steps in research process- Selection of a topic, search strategies, a review of literature, formulation of a hypothesis, methodology, ● Analyzing the results and making conclusions ● Variables- Definition, Types and levels of measurements ● Research design and sampling in life sciences 	
2	Tools of Research	15
	<ul style="list-style-type: none"> ● Tools of research (focus on tools in nutrition review others) ● Concept of validity and reliability ● Ethics in research in general and with human beings ● Scientific writing – avoiding plagiarism, using citations, quotations, writing a bibliography, avoiding jargon, writing a research proposal ● Definition and types of statistics - descriptive and inferential 	
3	Statistics	15
	<ul style="list-style-type: none"> ● Descriptive statistics <ul style="list-style-type: none"> ○ frequencies and graphs ○ measures of central tendency- mean, median and mode ○ measures of variation- S.D., range ○ Standard scores- Z score, T score ● Hypothesis testing and significance levels Inferential stats. ● Contrast phenomena- t test, ANOVA, chi-square ● Relationships between variables- correlation, regression analysis 	
4	Writing Research Paper	15
	<ul style="list-style-type: none"> ● Research article discussions: Reviewing Learning Outcomes, methodology, statistical analysis, understanding results in research papers discussion in class with sample research articles. (minimum 7-8 different types) ● Scientific writing: Review paper writing 	

Reference Books

1. Bell, J. (1997): *Doing Your Research Project: A Guide for First-time Researchers in Education and Social Science*, Viva Books, New Delhi Bulmer,
2. M.C. (1984): *Sociological Research Methods: An Introduction*, Macmillan, Hong Kong. Festinger, L. and Katz, D. (ed.)
3. (1977): *Research Methods in the Behavioral Sciences*, Amerind Publishing, New Delhi. Holloway,
4. I. (1997): *Basic Concepts of Qualitative Research*, Blackwell Science, London. Jain,
5. G. (1998): *Research Methodology: Methods and Techniques*, Mangal Deep, Jaipur. Kothari,
6. C.R. (2000): *Research Methodology: Methods and Techniques*, Wishwa Prakashan, New Delhi. Kumar,
7. A. (1997): *Social Research Method (The Art of Scientific Investigation)*, Anmol Publication, New Delhi. Kumar,
8. A. (2002): *Research Methodology in Social Sciences*, Sarup and Sons, New Delhi. McBurney,
9. D.H. (2001): *Research Methodology*, Thomson-Wadsworth, Australia.
10. Statistics:
 1. Gupta, S. (2001) "Research Methodology and Statistical Techniques", Deep and Deep, New Delhi,
 2. Hooda, R.P. (2003) "Statistics for Business and Economics", 3rd ed., Macmillan India Ltd., Delhi,

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7. Communication and Counselling Skills - I

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Introduction and Concepts	7
Module 2	Transactional Analysis	8
Module 3	Personality Development	7
Module 4	Communication Skills	8
	Total	30

Course Objectives

1. To assist learners in developing their Personality and Etiquettes.
2. To enable learners to develop Communication Skills.

Course Outcome

After successful completion of the course the learner will be able to:

1. Understand the concept of personality and its development
2. Know the basic principles of communication

Detailed Syllabus

Module	Topics	No. of Lectures
1	Introduction and Concepts	7
	<ul style="list-style-type: none"> ● Self- concepts, attitudes, goals and values. 	
2	Transactional Analysis	8
	<ul style="list-style-type: none"> ● Introduction to transactional analysis - ego states, types of transactions, social time structuring, games, stamps, rackets, strokes and scripts. 	
3	Personality Development	7
	<ul style="list-style-type: none"> ● Building self- esteem, social skills, assertiveness training and leadership. 	
4	Communication Skills	8
	<ul style="list-style-type: none"> ● Definition, listening, non-listening, verbal and non-verbal communication (body language) barriers to communication. 	

Reference Books

1. Alien, R.K. (1970) Organisational Management through Communication.
2. Ashley,A(1992) A Handbook Of Commercial Correspondence, Oxford University Press.
3. Aswalthapa, K (1991) Organisational Behaviour, Himalayan Publication, Mumbai.
4. Atreya N and Guha (1994) Effective Credit Management, MMC School of Management, Mumbai.
5. Bahl,J.C. and Nagamia,S.M. (1974) Modern Business Correspondence and Minute Writing.
6. Balan,K.R. and Rayudu C.S. (1996) Effective Communication, Beacon New Delhi.

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8. Sanskrit/ Allied/ Other related courses

- Vedic Sukta of concord Samjnanasukta
- Ten verses describing rainy season from Ramayana
- Selected verses from the second chapter of Bhagavadgeeta
- Twenty verses from Raghuvamsha by Kalidasa (Canto I.1-20)
- Ashtapadi by Jayadev
- Ten chitrashlok verses
- Ten verses related to health from Ayurveda 8) Fifteen verses from modern Sanskrit literature – Vainayakam

OR

Effective Presentation Skills

Module 1-Fundamentals of Effective Presentations

Module 2- Preparing the Contents

Module 3- Speaking Skills

Module 4-Essentials for Dynamic Presentation and Speeches

***Syllabus of Courses of
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1. Nutrigenetics

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Introduction	15
Module 2	Introduction to genetics	15
Module 3	Etiology, Clinical features, basic diagnosis and nutritional management of inborn error	15
Module 4	Nutritional care for the children with special needs	15
	Total	60

Course Objectives

1. To evaluate the methodology and derivation of requirements for micronutrients.
2. To appreciate importance of nutrition immunity interactions and their operational implications.

Course Outcome

After successful completion of the course the learner will be able to:

1. Understand nutritional management in special conditions.
2. Track emerging concepts in the field of nutrition.

Detailed Syllabus

Module	Topics	No. of Lectures
1	Introduction	15
	<ul style="list-style-type: none"> ● Introduction to Nutrigenetics, Nutrigenetics and Disease, Human genetics. 	
2	Introduction to Genetics	15
	<ul style="list-style-type: none"> ● Diet and Microbiome, Epigenetics, Concepts of DNA, RNA, transcription and translation, transgenerational effect 	
3	Etiology, Clinical features, basic diagnosis and nutritional management of inborn errors	15
	<ul style="list-style-type: none"> ● Etiology, Clinical features, basic diagnosis and nutritional management of inborn errors of metabolism prognosis, symptoms, dietary management - Phenylketonuria, Galactosemia 	
4	Nutritional care for the children with special needs	15
	<ul style="list-style-type: none"> ● Nutritional care for the children with special needs – overview of the disability, food and nutritional needs and their modification. <ol style="list-style-type: none"> i. Attention deficit hyperactivity disorder ii. Autism iii. Cerebral palsy iv. Down's syndrome 	

Assignment

1. Scope of nutrigenetics,
2. Bombay blood group diets
3. Estimation of serum sodium
4. Estimation of serum potassium
5. Hospital visit for spO₂, spCO₂
6. Acid Ash and alkaline ash for food items

Meal planning and cooking for -

1. Type 1, type 2, GDM, Lada diabetes
2. Ischemic heart disease, atherosclerosis, CVD
3. Dyslipidemia
4. Allergic rhinitis, asthma, bronchitis, COPD
5. Hypothyroidism, hyperthyroidism, hashimotos , graves
6. Autoimmune condition
7. Cancer
8. Akd, Ckd,
9. Pcod. Endometriosis menopause
10. Burns sepsis trauma
11. Parkinson's, Alzheimer's, autism's Asperger's syndrome

Assignments -

1. Fad diets
2. Impaction of genetics on nutrition
3. Blood group diets
4. Prenatal trauma and impact on child health
5. Impact of lifestyle on health

Reference Books

1. Simopoulos A.P., Ordovas J.M. (Eds.) (2004). *Nutrigenetics and Nutrigenomics*. USA: Karger

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2. Disease Management through Nutrition - II

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Women's health	12
Module 2	Renal conditions	12
Module 3	Cancer	12
Module 4	Sepsis, Burns, Trauma	12
Module 5	Enteral-Parenteral Nutrition	12
	Total	60

Course Objective

1. To understand the importance of nutritional assessment in the care of patients.

Course Outcome

After successful completion of the course the learner will be able to:

1. Identify the health issues, clinical features and diagnosis of various parts of the human body.

Detailed Syllabus

Module	Topics	No. of Lectures
1	Women's health	12
	<ul style="list-style-type: none"> ● Etiology, clinical features, Basic diagnosis and nutritional management of Women's health PCOS, Endometriosis/ irregular periods ● Pre-Menopause/ Menopause - Impact of age on bone health, Estrogen and Osteoarthritis 	
2	Renal conditions	12
	<ul style="list-style-type: none"> ● Etiology, Clinical features, Basic diagnosis and Nutritional management of Renal conditions; ● Nephrotic syndrome, Nephritic syndrome, ARF, ESRD, CKD, Dialysis- types, how it is performed, IGA nephropathy, 	
3	Cancer	12
	<ul style="list-style-type: none"> ● Cancer- What is cancer, Impact of chemotherapy and radiation and MNT 	
4	Spesis, Burns, Trauma	12
	<ul style="list-style-type: none"> ● Etiology, clinical features, basic diagnosis and nutritional management of Spesis, Burns, Trauma 	
5	Enteral-Parenteral Nutrition	12
	<ul style="list-style-type: none"> ● Etiology, clinical features, basic diagnosis and nutritional management of Enteral-Parenteral Nutrition- RT, PEG, Gastrostomy, jejunostomy, TPN composition 	

Reference Books

1. Lee RD & Neiman DC. (2009). Nutritional Assessment. 5th Edition. Brown & Benchmark.
2. Mahan, L. K. and Escott Stump. S. (2016) Krause's Food & Nutrition Therapy 14th ed. Saunders-Elsevier
3. Shils, M.E., Shike, M, Ross, A.C., Caballero B and Cousins RJ (2005) Modern Nutrition in Health and Disease. 10th ed. Lipincott, William and Wilkins.
4. Williams, S.R. (2001) Basic Nutrition and Diet Therapy. 11th ed. Times Mirror Mosby College Publishing
5. World Cancer Research Fund & American Institute for Cancer Research (2007) Food, Nutrition, Physical Activity and the Prevention of Cancer- A Global Perspective. Washington E.D. WCRF

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3. Lifestyle Pillars

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Sleep Cycle	15
Module 2	Stress	15
Module 3	Hydration	15
Module 4	Exercise	15
	Total	60

Course Objectives

1. To identify sleep cycles and its impact in human body and mind.
2. To determine the causes of stress and hydration.
3. To understand the importance of exercise and its impact on body.

Course Outcome

After successful completion of the course the learner will be able to:

1. Understand the basic lifestyle changes in a human body
2. Explain the benefits and need for exercise in a human body

Detailed Syllabus

Module	Topics	No. of Lectures
1	Sleep cycle	15
	<ul style="list-style-type: none"> • Sleep- cycle, brain waves, conditions that impact sleep cycle, sleep and bedtime routine, • Importance of sleep and side effects of sleep deprivation - immunity, hormonal imbalance, gut etc adrenal fatigue with respect to sleep - neurotransmitters with respect to sleep and its impact on blood parameters 	
2	Stress	15
	<ul style="list-style-type: none"> • Stress/ emotional health - how does stress affect, Sympathetic Nervous system and Parasympathetic Nervous system, stress and inflammation, • Stress-immunity, ways to manage stress, adrenal fatigue with respect to stress neurotransmitters with respect to stress and its impact on blood parameters 	
3	Hydration	15
	<ul style="list-style-type: none"> • Hydration and basic lifestyle changes - Hydration- Functions and importance- adequate hydration- foods that dehydrate you, side effects of dehydration, • Concepts of IF, DF, CIF, Hydration and its impact on cell functions and various metabolic processes like glycolysis, various metabolic functions, hydration during exercise, overhydration and its impact on kidney 	
4	Exercise	15
	<ul style="list-style-type: none"> • Exercise- Benefits of exercise, Types - Aerobic and Anaerobic- and cover eggs on detail, side effects of over exercising, impact of no/ over exercise on muscles- weight gain/loss and exercise/ muscle gain and loss with respect to exercise, • Impact of exercise on BMR, relation of exercise with sleep and stress, impact of dehydration on exercise 	

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4. Public Health Nutrition

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	An overview of Public health Nutrition	15
Module 2	Dietary Guidelines	15
Module 3	Public health Issues	15
Module 4	HIV and macronutrients and micronutrient nutrition Public Health Nutrition strategies	15
	Total	60

Course Objective

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

Course Outcome

After successful completion of the course the learner will be able to:

1. Gain an understanding of Public Health Nutrition
2. Discuss the various dietary guidelines related to nutrition
3. Identify the Public Health Issues and health related strategies

Detailed Syllabus

Module	Topics	No. of Lectures
1	An overview of Public health Nutrition	15
	<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 	
2	Dietary Guidelines	15
	<ul style="list-style-type: none"> ● Dietary goals versus dietary guidelines. ● Quantitative and Qualitative dietary guidelines. ● Steps involved in devising dietary guidelines. Food Choice Population issues affecting food choice. Individual issues affecting food choice. ● Assessment of Nutritional Status in Individuals and Populations. New-born care, child survival, ● Child Undernutrition and nutritional status of women and Children. ● 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. 	

	<ul style="list-style-type: none"> ● Dual nutrition burden in women: causes, consequences and control measures. Interventions to improve dietary intake and nutritional status in women. 	
3	Public health Issues	15
	<ul style="list-style-type: none"> ● Study of the following with greater emphasis to the current Indian context. ● Nutrition and Reproductive health Maternal nutrition, Intrauterine Growth Retardation (IUGR)and foetal outcome. ● Geriatric Nutrition and Common health problems. ● Public Health Impact of Obesity-Obesity as a determinant of mortality and morbidity ● Micronutrient deficiency. ● Hidden Hunger ● Vitamin A deficiency ● Vitamin D deficiency ● Iodine Deficiency Disorders ● Iron deficiency and anaemia ● Zinc Deficiency 	
4	HIV and macronutrients and micronutrient nutrition Public Health Nutrition strategies	15
	<ul style="list-style-type: none"> ● HIV and macronutrients and micronutrient nutrition Public Health Nutrition strategies related non-communicable chronic disorders ● Prevalence of non-communicable diseases at global and national level Prevention and Control of NCDs <ul style="list-style-type: none"> ○ Cancers ○ Diabetes ○ Hypertension. ● CVD Nutrition –Health education and communication for behavioural change. ● Techniques and Methodologies. Research Methods used in Public health nutrition: ● Critical Factors-Case Studies 	

Reference Books

1. Gibney, M.J. Margetts, B.M., Kearney, J.M. and Arab, L. (2012). Public health Nutrition.
2. The Nutrition Society Blackwell Publishing Company, Oxford.,Kent,UK Jelliffe, D.B. (1966).
3. The Assessment of the Nutritional Status of the community, WHO Geneva. Lee, R.D. and Nieman, D.C. (2003).
4. Nutritional Assessment 3rd Ed. McGraw – Hill Higher education. NewYork. 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).
5. 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)
6. Public Health Nutrition in Developing countries –Part I & Part II Woodhead Publishing India Pvt. Ltd,New Delhi.

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5. Dissertation

An independent research project work undertaken by students under the guidance of a teacher, can either be a survey or practical research. The research should be submitted at the end of session in the form of a dissertation.

The student should appear before the examiners board and the dissertation shall be evaluated by means of presentation and viva - voce.

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**6. Entrepreneurship & Management
Modules at a Glance**

Sr. No.	Modules	No. of lectures
Module 1	Introduction to Food Service Units	7
Module 2	Organization & Management	7
Module 3	Food Production Process	8
Module 4	Financial Management & Personnel Management	8
	Total	30

Course Objectives

1. To understand the forms and practices adopted at small scale enterprises
2. To develop competencies in financial process practiced at the organisations
3. To take up entrepreneurship ventures in food and other related areas

Course Outcome

After successful completion of the course the learner will be able to:

1. Choose the resources needed for an enterprise
2. Compile the sales management tasks at the food-based business
3. Analyse the various departments and their functions.

Detailed Syllabus

Module	Topics	No. of Lectures
1	Introduction to Food Service Units	7
	<ul style="list-style-type: none"> ● Origin of Food Service units ● Kinds of food service units ● Menu Planning <ul style="list-style-type: none"> ○ Importance of menu ○ Factors affecting menu planning ○ Types of menu 	
2	Organization & Management	7
	<ul style="list-style-type: none"> ● Principles of management ● Functions of management/ manager 	
3	Food Production Process	8
	<ul style="list-style-type: none"> ● Food purchase and receiving ● Storage ● Quantity food production: Standardization of recipes, Recipe adjustments and portion control ● Quantity food production techniques ● Food service ● Food hygiene and sanitation ● Space and Equipment <ul style="list-style-type: none"> ○ Types of kitchen areas, Flow of work and work area relationship ○ Equipment <ul style="list-style-type: none"> a) Factors affecting selection of equipment b) Equipment needs for different situations 	
4	Financial Management & Personnel Management	8
	<ul style="list-style-type: none"> ● Importance of Financial Management ● Budgets and Budgeting process ● Cost concepts ● Functions of a personnel manager, 	

	<ul style="list-style-type: none"> ● Factors to consider while planning the kind and number of personnel: Menu, type of operations, Type of service, Job description and job specification 	
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Planning of A Small Food Service

- Preliminary Planning

Survey of types of units, identifying clientele, menu, operations and delivery

- Planning the set up:
 - a) Identifying resources
 - b) Developing Project plan
 - c) Determining investments
- Development of a business plan

Assignments

1. Market survey for food items both raw and processed
2. Survey of food service units
3. Standardization of a recipe
4. Preparing Quick Foods for scaling up for quantity production
5. Planning menus for the following
 - Packed meals for office employees
 - Nutritious tiffins for school children
 - School/college canteens
6. Demonstration of a specialized cuisine
7. Develop a checklist for good hygiene practices

Reference Books

1. West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition Revised by Hargar FV, Shuggart SG, & Palgne Palacio June, Macmillian Publishing Company New York.
2. Sethi Mohini (2005) Institution Food Management New Age International Publishers
3. Knight J B & Kotschevar LH (2000) Quantity Food Production Planning & Management 3rd edition John Wiley & Sons
4. Dessler Gary (1987) Personnel Management, Modern Concepts & Techniques Prentice Hall New Jersey
5. Tripathi P C (2000) Personnel management 15th ed Sultan Chand, New Delhi
6. Kazarian E A (1977) Food Service facilities Planning 3rd Edition Von Nostrand Reinhold New York
7. Kotas Richard & Jayawardardene. C (1994) Profitable Food and Beverage Management Hodder & Stoughton Publications
8. Longree K, Langree K, Longrie K (1996) Quantity Food sanitation, John Wiley & sons
9. Roday .S (2003) Food Hygiene & Sanitation , Tata Mc Graw Hill publication Ltd
10. Taneja S and Gupta SL (2001) Entrepreneurship development, Galgotia Publishing

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7. Sanskrit/ Allied/ Other related courses

- Selected portion from Taittiriyaopaniṣad
- An extract from drama Pratiṃā by Bhaṣa
- A story from Pañcātātram
- An extract from Mricchakatikā by Śhūdraka
- A dialogue based on Meghadūtam
- An extract from drama Malavikāgnimitram
- Spy system in KāutilyaArthashastra (5 types of stationary spies)

OR

Selling Skills

Module 1-Basics of Selling

Module 2-Sales Conversation

Module 3-Negotiation

Module 4-Closure