MGM University

Vision

- To ensure sustainable human development which encourages self-reliant and self-content society.
- To promote activities related to community services, social welfare and also Indian heritage and culture.
- To inculcate the culture of non-violence and truthfulness through vipassanna meditation and Gandhian Philosophy.
- To develop the culture of simple living and high thinking

Mission

- To impart state of art education and technical expertise to students and give necessary training to teachers to create self-reliant society for future.
- To encourage students to participate in Indian and International activities in sports, literature, etc. so that future generation becomes base for free and liberal society
- To educate students in areas like Management, Finance, Human relations to inculcate philosophy of simple living and high thinking value of simple economic society.
- To inculcate culture of non-violence and truthfulness through Vipassana.

  To sustain activities of Indian culture (viz. classical dance, music and fine arts) through establishing institutes like Mahagami, Naturopathy, etc.

विद्यापीठ गीत

अत्त दिप भव भव प्रदिप भव,

स्वरूप रूप भव हो

ज्ञान सब्ब विज्ञान सब्ब भव ,

सब्ब दिप भव हो

अत्ताहि अत्त नो नाथो ,

अत्ताहि अत्त नो गति

अत्त मार्गपर अप्रमादसे है तुझे चलना

सब्ब का कल्याण हो ,

वो कार्यकुशल करना

सब्ब का उत्तम मंगल , पथप्रदर्शक हो

अत्त दिप भव भव प्रदिप भव ,

स्वरूप रूप भव हो

ज्ञान सब्ब विज्ञान सब्ब भव ,

सब्ब दिप भव हो

बुद्धमं शरनं गच्छामि :

धम्मं शरनं गच्छामि :

संघं शरनं गच्छामि :

INSTITUTE OF BIOSCIENCE AND TECHNOLOGY

We are contributor in Medical and Advances in Agriculture sciences by studying living systems and organisms for development and research purpose. We shape our student for their bright future in thin field by proving knowledge and best practical facilities.

The Mahatma Gandhi Mission's Institute of Biosciences and Technology is promoted by Mahatma Gandhi Mission (MGM) Trust. The Mahatma Gandhi Mission Trust was founded with a vision to address the educational, health and other social needs of the public since 1983. MGM visualized the density of the field of life science resources and possible careers which will be helpful in the area of research. Through this keen interest MGM established the department of Biotechnology and Bioinformatics in 2001-2002.

Then in the year 2002-2003, with the affiliation of Dr. Babasaheb Ambedkar Marathwada University, the course of M.Sc. Biotechnology was started – a very large ambition and a great milestone in the area of Biotechnology. In the year 2004-05 MGM's IBT launched a course of B.Sc. Agricultural Biotechnology under the affiliation of Marathwada Krishi Vidyapeeth, Parbhani. With the launch of this course the department of biotechnology and Bioinformatics became the crowning glories of Marathwada region.

A tiny seedling turned into a huge tree with multiple branches. In the year 2005-2006 MGM's IBT visualized the importance informatics. Consistent with the attitude to excel in the field of biotechnology, the course of M.Sc. Bioinformatics was launched under the affiliation of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, in 2005-2006.

Now MGM's IBT is well established in the field of research focusing on the areas of Biotechnology and Bioinformatics with well-equipped R&D laboratory encouraging and supporting extensive research.

Vision

"To achieve academic excellence through research, teaching and training in biosciences disciplines which will eventually serve and benefits the society"

Mission

- To Generate necessary and intellectually qualified biological work force.
- Strive to provide services and solutions through biologic knowledge forecasting the welfare and benefit of the society

Programs offered at IBT

Undergraduate Programmes	Postgraduate Programmes	PhD Programmes	PG Diploma Programmes	Certificate Programmes
B.Sc. Biotechnology Honours / Honours with Research	M.Sc. Biotechnology	Ph.D. Biotechnology		
B.Sc. Microbiology Honours/ Honours with Research	M.Sc.Microbiology/ Virology	Ph.D. Microbiology		
B.Sc. Bioinformatics Honours / Honours with Research	M.Sc. Bioinformatics	Ph.D. Bioinformatics		
B.Sc. Food Technology and Processing Honours / Honours with Research	M.Sc. Food Technology	Ph.D. Food Technology		
B.Sc. Food nutrition and Ditetics Honours / Honours with Research	M.Sc. Plant Breeding & Molecular Genetics	Ph.D. Plant Breeding & Molecular Genetics		
		Ph.D. Plant Biotechnology		

Name of Program – B.Sc. (Food Technology and Processing) Hons. / Hons. with Research

Duration – Four Years

Eligibility –

1. Maharashtra State Candidate.

(i) The Candidate should be an Indian National and having domicile of Maharashtra state and/or born in Maharashtra state.

(ii) Passed HSC or its equivalent examination with Physics and Mathematics as compulsory subjects along with one of the Chemistry or Biotechnology or Biology or Technical Vocational subject or Computer Science or Information Technology or Informatics Practices or Agriculture or Engineering Graphics or Business Studies, and obtained at least 45% marks (at least 40% marks, in case of Backward class categories and Persons with Disability candidates belonging to Maharashtra State only) in the above subjects taken together and the candidate should have appeared in MGMU-CET / MHT-CET / PERA CET should obtain non zero score in MGMU-CET / MHT-CET / PERA CET. However, preference shall be given to the candidate obtaining non-zero positive score in MGMU-CET over the candidates who obtained non-zero score in MHT-CET / PERA CET.

2. All India Candidates –

(i) The Candidate should be an Indian National.

(ii) Passed HSC or its equivalent examination with Physics and Mathematics as compulsory subjects along with one of the Chemistry or Biotechnology or Biology or Technical Vocational subject or Computer Science or Information Technology or Informatics Practices or Agriculture or Engineering Graphics or Business Studies , and obtained at least 45% marks (at least 40% marks, in case of Backward class categories and Persons with Disability candidates belonging to Maharashtra State only) in the above subjects taken together and candidate should have appeared in MGMU-CET / MHT-CET / PERA CET should obtain non-zero score in MGMU-CET / MHT-CET / PERA CET. However, preference shall be given to the candidate obtaining non-zero positive score in over the candidates who obtained non-zero score in MGMU-CET / MHT-CET / PERA CET.

Name of Faculty: Basic and Applied SciencesGraduate (UG) Program
Name of the College/Institute/Department/School: Institute of Bioscience and Technology

Name of the Programme: B.Sc./B.Sc. Hons. /B.Sc. Hons with Research
Programme Type (UG/PG): **UG/** B.Sc./B.Sc. Hons./B.Sc. Hons with Research of Food Nutrition and Dietetics
Duration: 04 Years (08 Semesters)

Semester I

Course Category	Course Code	Course Title	Nature of Course	No. of Credits	Teaching (Contact hrs/ week)		Evaluation Scheme (Marks)			Minimum Passing (Marks)		
					L	P	Internal	External	Total	Internal	External	Total
MM	FND42MML101	Principles of Human Nutrition-I	Lecture	2	2		30	20	50		8	20
MM	FND42MML102	Human Anatomy & Physiology-I	Lecture	3	3	-	60	40	100		16	40
IKS	FND42IKL101	Holistic medicine and wellness	Lecture	2	2	-	30	20	50		8	20
AEC	MGM54AEL104	Functional Marathi	Lecture	2	2	-	30	20	50		8	20
OE		Open Elective I	Lecture	2	2	-	30	20	50		8	20
OE		Open Elective II	Lecture	2	2	-	30	20	50		8	20
VEC	MGM21VEL101	Environmental Studies	Lecture	2	2	-	30	20	50		8	20
VSC	FND42VSP101	Practical Techniques In Human Nutrition	Practical	2		4	30	20	50		8	20
SEC	FND42SEP101	Nutrition Lab-I	Practical	2		4	30	20	50		8	20
MM	FND42MMP101	Key Skills for Nutrition and Dietetics I	Practical	1	-	2	30	20	50		8	20
CC	MGM62CCP101	Cultural Activities	Practical	2		4	30	20	50		8	20
Total				**22**	**15**	**14**	360	240	600		96	240

Note:
Nature of Course : L- Lecture, P-Practical, S-Seminar, J-Project, I-Internship, D-Dissertation,
Course Category: MM-Major Mandatory, ME-Major Elective, MI-Minor, OE-Generic / Open electives, VSC-Vocational skill course, SEC-Skill Enhancement course, AEC-Ability Enhancement course, IKS-Indian Knowledge system, VEC-Value Education course, OJT-On Job Training / Internship / Apprenticeship, FP-Field project, CEP-Community engagement and service, CC-Co – curricular course, RM-Research methodology, RP-Research project

Semester II													
Course Category	**Course Code**	**Course Title**	**Nature of Course**	**No. of Credits**	**Teaching (Contact hrs/ week)**		**Evaluation Scheme (Marks)**			**Minimum Passing (Marks)**		
					L	**P**	**Internal**	**External**	**Total**	**Internal**	**External**	**Total**
MM	FND42MML 103	Principles of Human Nutrition-II	Lecture	2	2		30	20	50		8	20
MM	FND42MML 104	Human Anatomy & Physiology-II	Lecture	3	3	-	60	40	100		16	40
MI		Minor Course	Lecture	2	2	-	30	20	50		8	20
AEC	MGM54AEL 101	Communicative English	Lecture	2	2	-	30	20	50		8	20
OE		Open Elective I	Lecture	2	2	-	30	20	50		8	20
OE		Open Elective II	Lecture	2	2	-	30	20	50		8	20
VEC	MGM21VEL 102	Universal Human Values	Lecture	2	2	-	30	20	50		8	20
VSC	FND42VSP102	Techniques In Dietetics and Nutritional Research	Practical	2		4	30	20	50		8	20
SEC	FND42SEP102	Nutrition Lab-II	Practical	2		4	30	20	50		8	20
MM	FND42MMP102	Key Skills for Nutrition and Dietetics II	Practical	1	-	2	30	20	50		8	20
CC	MGM82CCP 103	Sports	Practical	2		4	30	20	50		8	20
Total				**22**	**15**	**14**	360	240	600		96	240

Note:
Nature of Course : L- Lecture, P-Practical, S-Seminar, J-Project, I-Internship, D-Dissertation,
Course Category: MM-Major Mandatory, ME-Major Elective, MI-Minor, OE-Generic / Open electives, VSC-Vocational skill course, SEC-Skill Enhancement course, AEC-Ability Enhancement course, IKS-Indian Knowledge system, VEC-Value Education course, OJT-On Job Training / Internship / Apprenticeship, FP-Field project, CEP-Community engagement and service, CC-Co – curricular course, RM-Research methodology, RP-Research project

Level 4.5 Award of UG certificate with 40 credits and an additional 4-credits core NSQF course / internship OR continue with major and minor

Semester III													
Course Category	**Course Code**	**Course Title**	**Nature of Course**	**No. of Credits**	**Teaching (Contact Hrs/ week)**		**Evaluation Scheme (Marks)**			**Minimum Passing (Marks)**		
					L	**P**	**Internal**	**External**	**Total**	**Internal**	**External**	**Total**
MM	FND42MML201	Nutrition through the life cycle- I	Lecture	3	3	-	60	40	100	-	16	40
MM	FND42MML202	Food Safety Preservation and Legislation	Lecture	2	2	-	30	20	50	-	08	20
MM	FND42MML203	Fundamentals of Food Science-I	Lecture	2	2	-	30	20	50	-	08	20
OE		Open Elective V	Lecture	2	2	-	30	20	50	-	08	20
MI		Minor Course	Lecture	3	3	-	60	40	100	-	16	40
AEC	MGM54AEL103	Functional Hindi	Lecture	2	2	-	30	20	50	-	08	20
MI		Minor Course	Practical	1	-	2	30	20	50	-	08	20
VSC	FND42VSP201	Practical of Nutrition through Life cycle	Practical	2	-	4	30	20	50	-	08	20
MM	FND42MMP201	Practical of Food preservation	Practical	1	-	2	30	20	50	-	08	20
FP	FND42FPJ201	Filed Project	Project	2	-	4	30	20	50	-	08	20
CC	MGM82CCP201	Health and Wellness	Practical	2	-	4	30	20	50	-	08	20
Total				22	14	16	390	260	650	0	104	260

Note:
Nature of Course : L- Lecture, P-Practical, S-Seminar, J-Project, I-Internship, D-Dissertation,
Course Category: MM-Major Mandatory, ME-Major Elective, MI-Minor, OE-Generic / Open electives, VSC-Vocational skill course, SEC-Skill Enhancement course, AEC-Ability Enhancement course, IKS-Indian Knowledge system, VEC-Value Education course, OJT-On Job Training / Internship / Apprenticeship, FP-Field project, CEP-Community engagement and service, CC-Co – curricular course, RM-Research methodology, RP-Research project

Level 5.0Award of UG Diploma in major and minor with (44+44)= 88 credits and an additional 4-credits core NSQF course / internship OR continue with major and minor

Semester IV												
Course Category	**Course Code**	**Course Title**	**Nature of Course**	**No. of Credits**	**Teaching (Contact Hrs/ week)**		**Evaluation Scheme (Marks)**			**Minimum Passing (Marks)**		
					L	**P**	**Internal**	**External**	**Total**	**Internal**	**External**	**Total**
MM	FND42MML 204	Nutrition Diagnosis and intervention	Lecture	2	2		30	20	50	-	08	20
MM	FND42MML 205	Nutrition through the life cycle II	Lecture	3	3	-	60	40	100	-	16	40
MM	FND42MML 206	Fundamentals of Food Science-II	Lecture	2	2	-	30	20	50	-	08	20
OE		Open Elective VI	Lecture	2	2	-	30	20	50	-	08	20
MI		Minor Course	Lecture	3	3	-	60	40	100	-	16	40
AEC	MGM54AEL 203	Communication Skills	Lecture	2	2	-	30	20	50	-	08	20
SEC	FND42SEP201	Clinical Nutrition and Dietetics (Case Study)	Practical	2	-	4	30	20	50	-	08	20
MI		Minor Course	Practical	1	-	2	30	20	50	-	08	20
MM	FND42MMP 202	Dietary Assessment Techniques for Dieticians	Practical	1	-	2	30	20	50	-	08	20
CEP	FND42CEP201	Community Engagement Programs	Project	2	-	4	30	20	50	-	08	20
CC	MGM73CCP 105	Fine Arts	Practical	2	-	4	30	20	50	-	08	20
Total				**22**	**14**	**16**	**390**	**260**	**650**	**-**	**104**	**260**

Note:
Nature of Course : L- Lecture, P-Practical, S-Seminar, J-Project, I-Internship, D-Dissertation,
Course Category: MM-Major Mandatory, ME-Major Elective, MI-Minor, OE-Generic / Open electives, VSC-Vocational skill course, SEC-Skill Enhancement course, AEC-Ability Enhancement course, IKS-Indian Knowledge system, VEC-Value Education course, OJT-On Job Training / Internship / Apprenticeship, FP-Field project, CEP-Community engagement and service, CC-Co – curricular course, RM-Research methodology, RP-Research project

Semester VI													
Course Category	**Course Code**	**Course Title**	**Nature of Course**	**No. of Credits**	**Teaching (Contact hrs/ week)**		**Evaluation Scheme (Marks)**			**Minimum Passing (Marks)**		
					L	**P**	**Internal**	**External**	**Total**	**Internal**	**External**	**Total**
MM	FND42MML304	Global Issues in Nutrition	Lecture	2	2		30	20	50		8	20
MM	FND42MML305	Food Microbiology and toxication-II	Lecture	3	3		60	40	100		16	40
MM	FND42MML306	Medical Nutrition Therapy-II	Lecture	3	3		60	40	100		16	40
ME	FND42MEL202	Family Meal Management	Lecture	3	3		60	40	100		16	40
MI		Minor Course	Lecture	3	3		60	40	100		16	40
MI		Minor Course	Practical	2		4	30	20	50		8	20
OJT	FND42JTP301	On Job Training	Practical	4		8	60	40	100		16	40
MM	FND42MMP302	Biostatistics and scientific writing	Practical	1		2	30	20	50		8	20
MM	FND42MMP303	Diet Therapy (Case Study)	Practical	1		2	30	20	50		8	20
ME	FND42MEP202	Family Meal Management Survey	Practical	1		2	30	20	50		8	20
				22	**14**	**16**	450	300	**750**		120	300

Note:
Nature of Course : L- Lecture, P-Practical, S-Seminar, J-Project, I-Internship, D-Dissertation,
Course Category: MM-Major Mandatory, ME-Major Elective, MI-Minor, OE-Generic / Open electives, VSC-Vocational skill course, SEC-Skill Enhancement course, AEC-Ability Enhancement course, IKS-Indian Knowledge system, VEC-Value Education course, OJT-On Job Training / Internship / Apprenticeship, FP-Field project, CEP-Community engagement and service, CC-Co – curricular course, RM-Research methodology, RP-Research project

Level 5.5 Award of UG degree in major and minor (44+44+44)=132 credits OR continue with major and minor

Semester VII													
Course Category	**Course Code**	**Course Title**	**Nature of Course**	**No. of Credits**	**Teaching (Contact hrs/ week)**		**Evaluation Scheme (Marks)**			**Minimum Passing (Marks)**		
					L	**P**	**Internal**	**External**	**Total**	**Internal**	**External**	**Total**
MM	FND42MML401	Space Nutrition & Planning	Lecture	3	3		60	40	100		16	40
MM	FND42MML402	Diabetes Management	Lecture	3	3		60	40	100		16	40
MM	FND42MML403	Sports And Exercise Nutrition	Lecture	3	3		60	40	100		16	40
MM	FND42MML404	Entrepreneurship Development	Lecture	2	2		30	20	50		8	20
ME	FND42MEL301	Community Nutrition	Lecture	3	3		60	40	100		16	40
RM	FND42RML401	Research Methodology	Lecture	3	3		60	40	100		16	40
RM	FND42RMP401	Seminar (Research Paper Based)	Practical	1		2	30	20	50		8	20
ME	FND42MEP301	Community Nutrition	Practical	1		2	30	20	50		8	20
MM	FND42MMP401	Industrial Food Manufacture And Product Development	Practical	1		2	30	20	50		8	20
MM	FND42MMP402	Nutritional Lab	Practical	1		2	30	20	50		8	20
MM	FND42MMP403	Entrepreneurship Development Lab	Practical	1		2	30	20	50		8	20
				22	**17**	**10**	480	320	**800**		128	320

Note:
Nature of Course : L- Lecture, P-Practical, S-Seminar, J-Project, I-Internship, D-Dissertation,
Course Category: MM-Major Mandatory, ME-Major Elective, MI-Minor, OE-Generic / Open electives, VSC-Vocational skill course, SEC-Skill Enhancement course, AEC-Ability Enhancement course, IKS-Indian Knowledge system, VEC-Value Education course, OJT-On Job Training / Internship / Apprenticeship, FP-Field project, CEP-Community engagement and service, CC-Co – curricular course, RM-Research methodology, RP-Research project

Semester VIII													
Course Category	**Course Code**	**Course Title**	**Nature of Course**	**No. of Credits**	**Teaching (Contact hrs/ week)**		**Evaluation Scheme (Marks)**			**Minimum Passing (Marks)**		
					L	**P**	**Internal**	**External**	**Total**	**Internal**	**External**	**Total**
MM	FND42MML405	3 Months Internship (Hospital internship)	Lecture	3	3		60	40	100		16	40
MM	FND42MML406	Internship Report Writing	Lecture	3	3		60	40	100		16	40
MM	FND42MML407	Community Nutrition	Lecture	3	3		60	40	100		16	40
MM	FND42MML408	Geriatric Nutrition	Lecture	2	2		30	20	50		8	20
ME	FND42MEL302	Diet counselling and Patient Care	Lecture	3	3		60	40	100		16	40
OJT	FND42JTP401	On Job Training	Training	4		8	60	40	100		16	40
ME	FND42MEP302	Food Sanitation and Hygiene	Practical	1		2	30	20	50		8	20
MM	FND42MMP404	Food Safety and Quality Control	Practical	1		2	30	20	50		8	20
MM	FND42MMP405	Big Idea	Practical	1		2	30	20	50		8	20
MM	FND42MMP406	Seminar (Research Paper Based)	Practical	1		2	30	20	50		8	20
				22	**14**	**16**	450	300	**750**		120	300

Note:
Nature of Course : L- Lecture, P-Practical, S-Seminar, J-Project, I-Internship, D-Dissertation,
Course Category: MM-Major Mandatory, ME-Major Elective, MI-Minor, OE-Generic / Open electives, VSC-Vocational skill course, SEC-Skill Enhancement course, AEC-Ability Enhancement course, IKS-Indian Knowledge system, VEC-Value Education course, OJT-On Job Training / Internship / Apprenticeship, FP-Field project, CEP-Community engagement and service, CC-Co – curricular course, RM-Research methodology, RP-Research project

Level 6.0 Four year UG Honours Degree in major and minor (44+44+44+44) = 176 credits

Syllabus
Semester-III

Course code: FND42MML201 **Course category:** Major Mandatory	**Course name:** Nutrition through the life cycle I
Credits: 3 **Teaching scheme:** L-3	**Evaluation scheme:** CA–60, ESE–40
Exam Duration: 02 Hrs	
Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.	
Course Objectives:	
1. To introduce students with the basic concepts and principles of menu planning.	
2. To make students understand the application of concepts & principles in pregnancy	
3. To develop the ability to integrate various food for lactating mother.	
4. Critical comments on the scenario of health and the nutrition situation of women and men to various levels	
5. Menu planning for adults, pregnancy and lactation and elderly people	
Course Outcomes: At the end of the course, the students will be able to -	
CO1: Student will be able to apply the acquired knowledge in various fields of study.	
CO2: Students will be able to develop enhanced skills for identification of issues in the field of food and nutrition	
CO3: Students will be able to develop and practically applicable strategies for research projects	
CO4: Students will be able to use the acquired knowledge in Dietetics field.	

Contents –

Unit	Content	Teaching hours
I	Steps of Menu Planning, Nutrition and food Requirement for Adults, Nutritional requirements, Food Requirements	**9**
II	Nutrition for reproductive health and lactation, Preconception and fertility and conception, Pregnancy – Physiological changes, Periconceptional Nutrition, Nutritional Requirements, Food requirements, General Dietary Problems complication, Indian Pregnant women	**9**
III	Nutritional and Food equipment's of Lactating Women, Role of Hormones in Milk Production, Nutritional Requirements, Food Requirements, Food requirements, Indian Nursing Mother	**9**
IV	Nutritional and food requirements During old Age, Processing of age Nutritional Requirements, Food Reequipments, Nutritional Related Problems of old age, Degenerative Diseases, Exercise and Old Age, Drugs, and old Age	**9**
V	**Introduction to Nutrition and Life Stages** - Understanding the importance of nutrition from prenatal to geriatric stages. **Prenatal Nutrition** - Addressing specific dietary needs during pregnancy for maternal and fetal health	**9**

Text Books:
1. Principles of Nutrition - Eva D. Wilson, Catherine H Fisher, Eastern Pvt Ltd.
2. Public Health & Nutritional care - Bhavana Shabarwala, Common wealth publisher
3. Nutrition in the Community-The Art of Delivering Services - Owen, A.Y & Fracle, R.T
4. Nutrition, principles and application in health promotion - Carol west suitor merrily forbes, Crowley, Lippincot companay Ltd. 5. Text Book of Human Nutrition - Bamji MS, Rao NP, and Reddy V.; 2009; Oxford & IBH Publishing Co. Pvt Ltd.
6. Park's Textbook of Preventive and Social Medicine - Park K (2011), 21st Edition. M/s Banarasidas Bhanot Publishers, Jabalpur, India.
7. Principles of Food Sanitation, 1st Edition, Wiley-BlackJay JM, Loessner DA, Martin J. (2005)
8. Modern Food Microbiology. 7th ed. Springer. Graw Hill Publishing Co. Ltd Marriott N G (1985). A VI publication USA.
Reference Books:
1. Dietetics – Shrilakshmi
2. Krause & Mahans - Krause's Food & the Nutrition Care Process, Janice L. Raymond and Kelly Morrow

Course code: FND42MML202 **Course category:** Major Mandatory	**Course name:** Food Safety Preservation and Legislation
Credits: 2 **Teaching scheme:** L-2	**Evaluation scheme:** CA–30, ESE–20
Exam Duration: 01 Hrs	
Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.	
Course Objectives:	
1. Ensure Food Safety: Implement measures to prevent foodborne illnesses and ensure the safety of food products throughout the supply chain.	
2. Preserve Food Quality: Employ preservation techniques to maintain the nutritional value, flavor, and appearance of food items.	
3. Compliance with Regulations: Understand and adhere to food safety regulations and legislation to meet legal requirements and ensure consumer protection.	
4. Promote Public Health: Educate individuals and communities about the importance of food safety practices to safeguard public health.	
Course Outcomes: At the end of the course, the students will be able to -	
CO1: Knowledge of Food Safety Regulations: Students will demonstrate an understanding of relevant food safety laws, regulations, and standards.	
CO2: Application of Preservation Techniques: Students will be able to apply various preservation methods such as canning, freezing, and drying to maintain food quality and safety.	
CO3: Risk Assessment Skills: Students will develop the ability to assess potential hazards in food production and distribution and implement appropriate control measures.	
CO4: Communication and Collaboration: Students will effectively communicate food safety information and collaborate with stakeholders to address food safety issues.	
Contents –	

Unit	Content	Teaching hours
1	Introduction to concepts & definitions of food spoilage, safety and preservation. Microbes used in biotechnology, fermented foods and their benefits Food Safety – Basic Concepts- Introduction and Key Terms, Food safety and importance of safe food, Factors affecting food safety – Physical Hazards, Biological Hazards, Chemical Hazards Food Processing Operations, Principles, Good Manufacturing Practices. Overview of food packaging methods and principles including novel packaging materials/techniques	**7**
2	Evaluation of Food Quality- Sensory Evaluation, Sensory Tests, Types of Tests, Objective Evaluation, Instruments used for Texture Evaluation Over view of food additives with respect to their technological functions. Over view of anti- nutritional factors and their removal from foods. Over view of enzymes as food processing aids. Over view of nutraceuticals and functions foods. Overview of food contaminants and adulterants and their effects on human health. Food allergens and allergenicity. Importance of diet in alleviating health risks, especially non- communicable diseases Principles of food safety and preservation, methods of food preservation.	7

	Food fortification and food additives	
3	Tools and general principles and techniques in microbiological examination of foods. Food Preservation- Food Spoilage, Methods of food preservation, preservation by low temperature, preservation by high temperature, preservation by preservatives, preservation by osmosis, preservation by dehydration, preservation by fermentation. Public Health hazards due to contaminated foods: food borne infections and intoxications- symptoms, mode and sources of transmission and methods of preservation. Investigation and detection of food borne diseases outbreak.	8
4	Food Adulteration, Types of Adulterants, and methods of detection, Nutrition Enhancement Methods - Food Fortification, Enrichment, Supplementation, Fermentation, Germination, Pre- and Probiotics and Organic Foods. Food Safety Measures in a Food Service Establishment & Premises, Equipment and Utensils, Kitchen Layout, Storage, Transportation, Sanitary Facilities, Street Foods – Food Safety Measures, Temporary Food Service, Food Safety on Wheels,	8

Text Books:

1. Mahindra N. S, 2008, Food Additives, Characteristics, Detection and Estimation, APH Publishing Corporation, New Delhi.
2. Ward law G.M, Hamp J S, 2007, Perspectives in Nutrition, 7th edition, Mc Graw Hill
3. The Food Safety and Standards Act along with Rules and Regulations, 2011, Delhi, Commercial Law Publishers (India) Pvt Ltd.
4. Khanna K et al, 2013, Text Book of Nutrition and Dietetics, Phoenix publications
5. FSSAI Regulations book

Reference Books:

1. Sethi P and Lakra P, Aahaarvigyaan, Poshanevam suraksha, 2015, Elite Publishing House. 6.
2. Sharma S, Wadhwa A, 2003, Nutrition in the Community- a text book, Elite publishing house.
3. Fellows, P. J. (2016). Food Processing Technology: Principles and Practice, Fourth Edition, Woodhead Publishing
4. Kiron Prabhakar (2016). A Practical Guide to Food Laws and Regulations, Bloomsbury Professional, India.

Course code: FND42MML203	**Course name:** Fundamentals of Food Science-I
Course category: Major Mandatory	
Credits: 2 **Teaching scheme:** L-2	**Evaluation scheme:** CA–30, ESE–20
Exam Duration: 01 Hrs	
Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.	
Course Objectives:	
1. Understanding Food Composition: To comprehend the basic components of food, including macronutrients, micronutrients, water content, and additives.	
2. Exploring Food Processing Techniques: To learn about various methods used in food processing such as preservation, packaging, and thermal processing.	
3. Grasping Food Safety Principles: To understand the importance of food safety and hygiene practices to prevent foodborne illnesses.	
4. Studying Food Microbiology: To gain knowledge about microorganisms relevant to food science, including their roles in food spoilage, fermentation, and foodborne pathogens.	
Course Outcomes: At the end of the course, the students will be able to -	
CO1: The students understand the principles and fundamental concepts of food science.	
CO2: The students will be able apply the integrated acquired knowledge of food science concepts in health and nutrition	
CO3: The students gain the knowledge and learn the in-depth knowledge of various food groups.	
CO4: The students understand and gain practical insights of the effect of various techniques & methods on different food groups.	

Contents –

Unit	Content	Teaching hours
1	Food, Types of foods. Functional food groups-energy yielding, body building and protective foods (only sources and not properties and functions). Food Pyramid, My Plate. Study of various cooking methods - Boiling, steaming, stewing, frying, baking, roasting, broiling, cooking under pressure. Texturized foods, space foods, novel foods, organic foods, nano food, convenience foods	7
2	Introduction to Food Science. Effect of cooking and processing techniques on nutrients, Sensory evaluation of food Cereals, Millets and Pulses: Composition and nutritive value of wheat, rice and maize, Cereal cookery, Effect of cooking on parboiled and raw rice, principles of starch cookery, gelatinization, processing and storage in nutritive value. Methods for improving nutritional quality of foods-fermentation, germination, supplementation, fortification.	7
3	Vegetables and Fruits- Type, Composition, Nutritive value, Effect of cooking, processing and storage on pigments and nutritive value, Post	8

	harvest changes Milk and milk products- Nutritional composition, Properties, Processing, Storage and Packaging. Effects of heat, acid and enzyme on its quality, Milk Cookery. Sugar: Type, Function and Nutritional composition of sugar. Sugar cookery.	
4	Egg- Structure and Nutritional composition of egg, Evaluation of egg quality, Egg cookery Flesh Food- Type, Structure and Nutritional composition, Effect of cooking, processing and storage in nutritive value. Ageing, Tenderization, Curing	8

Textbooks/Suggested Reading

1. Gisslen, W. (2017). Professional baking. John Wiley & Sons.
2. Edwards, W. P., & Magee, T. R. (2008). Bakery technology and engineering. Springer Science & Business Media.
3. Stauffer, C. E. (2015). Technology of biscuits, crackers and cookies (2nd ed.). Woodhead Publishing.
4. Cauvain, S. P. (2013). Baking problems solved. Elsevier.
5. Shamsuzzoha, A. H. M., & Hossain, M. (2016). Bakery products science and technology. CRC Press.
6. Rao, P. H., & Ananthanarayanan, V. S. (2009). Bakery products: Science and technology. Blackwell Publishing.
7. Rao, P. H., & Ananthanarayanan, V. S. (2011). Handbook of food products manufacturing: Principles, bakery, beverages, cereals, cheese, confectionery, fats, fruits, and functional foods. John Wiley & Sons

Reference Books :

1. Meyer, .L.H (1987). Food Chemistry. CBS Publishers
2. "Cereal Grains: Properties, Processing, and Nutritional Attributes" by Sergio O. Serna-Saldivar
3. "Bakery Products: Science and Technology" by Y. H. Hui
4. "Milk and Dairy Products in Human Nutrition" edited by R. Gibson and J. Kurpad

Course code: FND42VSP201	**Course name:** Practical of Nutrition through life cycle – I
Course category: Vocational skill course	
Credits: 2 **Teaching scheme:** P-4	**Evaluation scheme:** CA–30, ESE–20
Exam Duration: 02 Hrs	
Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.	
Course Objectives:	

1. Understanding Life-Cycle Nutritional Needs: To comprehend the nutritional requirements at various stages of life, including infancy, childhood, adolescence, adulthood, and old age.
2. Assessing Nutritional Adequacy: To learn methods for assessing the adequacy of nutritional intake across different life stages and demographic groups.
3. Analyzing Dietary Patterns: To analyze dietary patterns and habits prevalent in different age groups and demographic backgrounds.
4. Evaluating Nutritional Interventions: To evaluate the effectiveness of nutritional interventions and recommendations in improving health outcomes throughout the life cycle.
5. Promoting Optimal Nutrition: To develop strategies for promoting optimal nutrition and healthy eating behaviors tailored to specific life stages and population groups.

Lab Outcomes: At the end of the course, the students will be able to -

LO1: Application of Nutritional Principles: Students will be able to apply principles of nutrition to assess and address the nutritional needs of individuals at various life stages.

LO2: Data Collection and Analysis: Students will gain proficiency in collecting and analyzing dietary data to assess nutritional status and develop dietary recommendations.

LO3: Nutritional Counseling Skills: Students will develop skills in providing nutritional counseling and education to individuals and groups across the life span.

LO4: Critical Thinking in Nutrition: Students will enhance critical thinking skills to evaluate nutrition-related research and interventions for their applicability to different life stages.

Contents –

Sr. No.	Title of the Experiment
1	Calculation of energy requirements (RDA) for adult male .
2	Exchange list for the Adults .
3	Calculate of energy requirements for adult female .
4	Prepare Menu planning for Adults Male .
5	Exchange list for the Female
6	Prepare Menu planning for Adults Female
7	Case study – take one adult male and calculate his protein requirements
8	Case study – take one adult female and calculate her protein requirements.
9	Calculate RDA for pregnancy 1 st and 2 nd trimester.

10	Prepare Exchange list for Pregnant lady.
11	Make a menu planning for pregnant women.
12	Actual preparation of menu planning (Cooking) for pregnant women.
13	Prepare Exchange list for lactating mothers.
14	Make a menu planning for lactating mothers
15	Actual preparation of menu planning (Cooking) for Lactating women.
16	Make a Guidelines for breastfeeding impotence .
17	Planning of Some recipes of Iron calcium folic acid rich.
18	Preparation of above recipes.
19	Calculation of above recipes.
20	Visit to Nursing home maternity home (HOSPITTAL)

Reference Books :

1. Nutrition Through the Life Cycle, 4th Edition - Author: Judith E. Brown - Publication: Cengage Learning - Year: 2010
2. Life Cycle Nutrition for Public Health Professionals - Author: Judith E. Brown - Publication: Springer Publishing Company - Year: 2020

Course code: FND42MMP201	**Course name:** Practical of Food Preservation
Course category: Major Mandatory	
Credits: 1 **Teaching scheme:** P-4	**Evaluation scheme:** CA–30, ESE–20
Exam Duration: 02 Hrs	
Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.	
Course Objectives:	

1. Understand the fundamental principles of food processing techniques such as fermentation, concentration, drying, dehydration, and chemical preservation.
2. Gain hands-on experience in food preservation methods and packaging technologies to enhance food shelf life and safety.
3. Learn the importance of quality control measures in food processing and preservation to ensure product integrity and consumer satisfaction.
4. Explore the role of regulatory guidelines and standards in governing food processing and preservation practices.
5. Develop practical skills in the production of a variety of preserved foods through different techniques and technologies.

Lab Outcomes: At the end of the course, the students will be able to -

LO1: Demonstrate proficiency in applying various food processing techniques for preservation, including fermentation, concentration, drying, dehydration, and chemical agents.

LO2: Analyze the effectiveness of different preservation methods in maintaining food quality, nutritional value, and safety.

LO3: Evaluate packaging materials and technologies suitable for different types of food products and processing methods.

LO4: Implement quality assurance protocols to monitor and control critical points in the food processing and preservation process.

Contents –

Sr. No.	Title of the Experiment
1	Lab rules
2	Adulteration of Milk
3	Adulteration of Pulses
4	Adulteration of spices
5	Adulteration of spices
6	Adulteration of Honey
7	Food preservation method. by drying
8	Asepsis handling of food.
9	Used of different drying methods (sun drying and machine drying)
10	Preparation of Jam

11	Preparation of Jelly
12	Preparation of sauces
13	Preparation of ketchups
14	Preparation of deafferents Chutneys
15	Visit to Food canning industry.
16	Visit to milk processing industry
17	Preparation of pineapple squash. Preparation go Syrup
18	Preparation 9 RTS (Ready to serve beverage)
19	Preparation of Mango Baz
20	Preparation of Lemon Pickel.

Textbooks/Suggested Reading

1. Mahindra N. S, 2008, Food Additives, Characteristics, Detection and Estimation, APH Publishing Corporation, New Delhi
2. Ward law G.M, Hamp J S, 2007, Perspectives in Nutrition, 7th edition, Mc Graw Hill
3. The Food Safety and Standards Act along with Rules and Regulations, 2011, Delhi, Commercial Law Publishers (India) Pvt Ltd.
4. Khanna K et al, 2013, Text Book of Nutrition and Dietetics, Phoenix publications FSSAI Regulations booklets
5. Catering Management An Integrated Approaches – Mohini Sethi, New Age International Publishers
6. Fundamentals of Foods, Nutrition and Diet Therapy - New Age International Publish

Course code: FND42FPJ201	**Course name:** Field Project
Course category: Field Project	
Credits: 2 **Teaching scheme:** J-4	**Evaluation scheme:** CA–30, ESE–20
Exam Duration: 02 Hrs	
Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.	
Course Objectives:	

1. Conduct comprehensive research on specific topics related to food nutrition and dietetics, aiming to deepen understanding and knowledge in the field.
2. Apply theoretical concepts learned in coursework to real-world scenarios, promoting practical skills development and problem-solving abilities.

Lab Outcomes: At the end of the course, the students will be able to -
LO1: Demonstrate proficiency in conducting literature reviews, critically evaluating information sources, and synthesizing findings relevant to food nutrition and dietetics projects.
LO2: Apply research methodologies and data collection techniques to investigate specific issues or trends in food nutrition and dietetics.

Contents –

Sr.No.	Title of the Experiment
1	Physiology and Promotion of Health
2	Community Nutrition
3	Clinical Nutrition
4	Food Safety and Quality
5	Nutritional Assessment

Ideas of project:

Defining project ideas is crucial for setting realistic expectations and laying out a clear vision for a project life cycle. Project-based learning not only provides opportunities for students to collaborate or drive their own learning, but it also teaches them skills such as problem solving, and helps to develop additional skills integral to their future, such as critical thinking and time management.

Literature survey:

A literature review establishes familiarity with and understanding of current research in a particular field before carrying out a new investigation. Conducting a literature review should

enable you to find out what research has already been done and identify what is unknown within your topic.

Performance:

Performance measurement during a project is to know how things are going so that we can have early warning of problems that might get in the way of achieving project objectives and so that we can manage expectations. The criteria of it as given below.

Implementation:

Follows closely the design, uses appropriate techniques with skill and understanding to produce a good solution.

Evaluation:

Clearly relates to the problem. Shows a good understanding and appreciation of the solution. Objectives of what has been done.

Project Log:

a. The individual student's effort and commitment.

b. The quality of the work produced by the individual student.

c. The student's integration and co-operation with the rest of the group.

d. The completeness of the logbook & time to time signature of guide

Objective: To elaborate the procedure for Guiding Student projects

Responsibility:

1. **All the Project Guide.**
2. **All Semester B.Sc. students**
3. **Project Heads**

PROCEDURE

SN	Activities	Responsibilities
1	PG students are deciding on their team members for their semester project with their proposed project domain and title	Project head, PG students
2	Director shall allocate the project guide based on their area of expertise (ot more than 3 batches to a guide)	Director
3	Ensuring that students have regular discussion meetings with their project guides.	Project guide Project head
4	Synopsis preparation and submission	Project head
5	Verification of student project log book	Project guide Project head
6	Approval of PPT: Abstract, existing, proposed system. 30% of proposed work. 80% of proposed work. 100% of	Project guide

	proposed work.	
7	Preparation and submission of progress report during project	Students Project head
8	Preparing list for Redo students (insufficient content, plagiarism, poor presentation, genuine absentees.	Project head
9	Submission of hard copy of project report	Project head
10	Evaluation of project report	External examiner
11	Organizing final project viva-voce	Project heads
12	Ensuring that if a candidate fails to submit the project report on or before the specified deadline , he/she is deemed to have failed in the project work and shall re – enroll for the same	Project head Project guide Director

Syllabus
Semester-IV

Course code: FND42MML204	**Course name:** Nutrition Diagnosis and intervention
Course category: Major Mandatory	
Credits: 2 **Teaching scheme:** L-2	**Evaluation scheme:** CA–30, ESE–20
Exam Duration: 01 Hrs	
Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.	
Course Objectives:	
Develop Assessment Skills: Enhance the ability to conduct thorough nutrition assessments, including gathering and analyzing relevant data on dietary intake, health status, and lifestyle factors.	
Formulate Nutrition Diagnoses: Learn to identify and prioritize nutrition-related problems based on assessment findings, using standardized terminology and diagnostic criteria.	
Design Tailored Interventions: Acquire the skills to develop evidence-based nutrition interventions that address identified nutrition diagnoses and individual client needs.	
Implement Intervention Plans: Gain proficiency in executing nutrition intervention strategies effectively, considering client preferences, cultural factors, and available resources.	
Evaluate Intervention Outcomes: Learn to assess the effectiveness of nutrition interventions, monitor progress, and adjust plans as necessary to achieve desired health outcomes.	
Course Outcomes: At the end of the course, the students will be able to -	
CO1: Demonstrate Competency in Nutrition Assessment: Students will be able to conduct comprehensive nutrition assessments, including anthropometric measurements, dietary analysis, and biochemical evaluations.	
CO2: Apply Nutrition Diagnosis Skills: Students will proficiently identify and articulate nutrition-related problems using standardized terminology and diagnostic criteria.	
CO3: Develop Effective Intervention Plans: Students will design evidence-based nutrition intervention plans tailored to individual client needs, preferences, and cultural backgrounds.	
CO4: Implement Intervention Strategies: Students will demonstrate the ability to implement nutrition intervention strategies in various settings, such as clinical, community, and food service environments.	

Contents –

Unit	Content	Teaching hours
1	Nutrition Care Process and Model Article, definition, importance of NCP, steps involved NCP Purpose, Tools for (kids and adults) & Examples Nutritional Risk Screening 2002 (NRS- 2002) Malnutrition Universal Screening Tool (MUST) Mini Nutritional Assessment (MNA), Nutrition assessment Tools	7
2	Nutrition Diagnosis Terminology. Nutrition Diagnosis Terms and Definitions., Nutrition Diagnosis Statements (or PES) for Caloric Energy Balance —Actual or estimated changes in energy (kcal). Oral or Nutrition Support Intake —Actual or estimated food and beverage intake from oral diet or nutrition support compared with patient/client's goal.	7
3	Fluid Intake Balance —Actual or estimated fluid intake compared with patient/client's goal. Nutrient Balance —Actual or estimated intake of specific nutrient	8

	groups or single nutrients as compared with desired levels. Fat and Cholesterol Balance, Protein Balance, Carbohydrate and Fiber Balance, Vitamin Balance, Mineral Balance Diagnosis Reference Sheets	
4	Nutrition Intervention Terms and Definitions. Introduction of the two phases of Nutrition Intervention: Planning and Implementing The organization of domains and classes of Nutrition Intervention The two phases of Nutrition Intervention: Planning and Implementing The organization of domains and classes of Nutrition Intervention Planning the Nutrition Intervention. Food And /Or Nutrient Delivery (ND Nutrition Education (E) Tools Nutrition counselling	8

Textbooks/Suggested Reading
1. Principles of Nutrition - Eva D. Wilson, Catherine H Fisher, Eastern Pvt Ltd.
2. Public Health & Nutritional care - Bhavana Shabarwala, Common wealth publisher
3. Nutrition in the Community-The Art of Delivering Services - Owen, A.Y & Fracle, R.T
4. Nutrition, principles and application in health promotion - Carol west suitor merrily forbes, Crowley, Lippincot companay Ltd.
5. Text Book of Human Nutrition - Bamji MS, Rao NP, and Reddy V.; 2009; Oxford & IBH Publishing Co. Pvt Ltd.
6. Park's Textbook of Preventive and Social Medicine - Park K (2011), 21st Edition. M/s Banarasidas Bhanot Publishers, Jabalpur, India.
7. Principles of Food Sanitation, 1st Edition, Wiley-BlackJay JM, Loessner DA, Martin J. (2005) Modern Food Microbiology. 7th ed. Springer. Graw Hill Publishing Co. Ltd Marriott N G (1985). A VI publication USA.
8. Principles of Nutrition - Eva D. Wilson, Catherine H Fisher, Eastern Pvt Ltd.
9. Public Health & Nutritional care - Bhavana Shabarwala, Common wealth publisher
10. Nutrition in the Community-The Art of Delivering Services - Owen, A.Y & Fracle, R.T
11. Nutrition, principles and application in health promotion - Carol west suitor merrily forbes, Crowley, Lippincot companay Ltd.
12. Text Book of Human Nutrition - Bamji MS, Rao NP, and Reddy V.; 2009; Oxford & IBH Publishing Co. Pvt Ltd.
13. Park's Textbook of Preventive and Social Medicine - Park K (2011), 21st Edition. M/s Banarasidas Bhanot Publishers, Jabalpur, India.
14. Principles of Food Sanitation, 1st Edition, Wiley-BlackJay JM, Loessner DA, Martin J. (2005) Modern Food Microbiology. 7th ed. Springer. Graw Hill Publishing Co. Ltd Marriott N G (1985). A VI publication USA.
Reference Books :
1. Nutrition , Monitoring & Assessment - Tara Gopala Das & Subadra Seshadari, Oxford Uni. Press
2. Perspectives in Nutrition - Wardlaw GM, Hampl JS.; Seventh Ed; 2007; McGraw Hill.

Course code: FND42MML205	**Course name:** Nutrition through Life cycle II
Course category: Major Mandatory	
Credits: 3 **Teaching scheme:** L-3	**Evaluation scheme:** CA–60, ESE–40
Exam Duration: 02 Hrs	
Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.	
Course Objectives:	
1. Understand Nutritional Requirements: Gain a comprehensive understanding of the nutritional needs during various stages of the human life cycle, including infancy, childhood, adolescence, adulthood, and old age.	
2. Explore Nutritional Challenges: Identify and analyze nutritional challenges and factors influencing dietary habits and choices across different life stages, considering physiological, psychological, and socio-economic factors.	
3. Examine Health Implications: Investigate the impact of nutrition on health outcomes and disease prevention throughout the life cycle, emphasizing the importance of balanced diets and healthy eating behaviors.	
4. Learn Lifespan Nutrition Planning: Acquire skills in planning and developing nutrition interventions and dietary recommendations tailored to specific age groups and life stages, considering diverse nutritional needs and preferences.	
5. Promote Optimal Health: Explore strategies to promote optimal nutrition and healthy lifestyle behaviors across the life cycle, aiming to enhance overall health and well-being.	
Course Outcomes: At the end of the course, the students will be able to -	
CO1: Students will gain better & integrated understanding of the principles and basic concepts of population and principles of nutritional assessment	
CO2: Students will develop the deeper insight for the principles of nutritional assessment in healthcare.	
CO3: Students will be familiarizing with various assessment technology and methods and their use for individual & public health	
CO4: Students will learn the application nutritional assessment principles techniques of public health and quality monitoring & surveillance system.	

Contents –

Unit	Content	Teaching hours
1	**Geriatric Nutrition** - Covers nutrition considerations for older adults, including addressing age-related changes, preventing malnutrition, and promoting independence and quality of life.	9
2	**Nutritional and Food Requirements of Infants** Growth and Development during Infancy, Nutritional Requirements, Food Requirements, Artificial Feeding, Low Birth Weight, Preterm Baby, Weaning	9
3	**Nutritional and food Requirements of Preschool Children Nutritional** and food Requirements of Preschool Children (1 to 6 Years) – Nutritional Requirements, Food Requirements, Nutrition Related Problems of Pre-schoolers, Feeding Programs	9
4	**Nutritional and food Requirements of School Children(7to12Years)-** NutritionalandfoodRequirementsofSchoolChildren(7to12Years)-NutritionalRequirements, Food Requirements, Diet Related Problems, Packed	9

	Lunches, School Lunch Programs	
5	**RDA For Adolescent** Nutritional and food Requirements of Adolescents-Nutritional Requirements, Food Requirements, Nutritional Problems, Physical Activity	9

Textbooks/Suggested Reading
1. Kaufman M (2007) Nutrition in promoting the public health strategies, principles and practices. Jones and Barlett Publishers
2. Park K (24th ed) (2017) Park's Textbook of Preventive and Social Medicine, Jabalpur M/s. Banarsidas Bhanot
3. ICMR (NIN) Dietary Guidelines for Indians (2nd ed) (2011) Dietary Guidelines for Indians: A manual
4. IFCT (2017) Indian food composition table, NIN 56
5. Ross A C (Eds) (2012) Nutrition in health and disease, Lippincott Williams & Wilkins
6. Shils M E (Eds) (1998) Nutrition in health and disease, Lippincott Williams & Wilkins
7. NNM: http://www.icds-wcd.nic.in/nnm/home.html Vir S (2011) Public health nutrition in developing countries, Woodhead Publishing India limited
8. Bonita, R., Beaglehole, R., Kjellström T. (2006) Basic Epidemiology, 2nd Edition, WHO,2006 http://whqlibdoc.who.int/publications/2006/9241547073_eng.pdf
9. Moon, G., Gould, M. (2000). Epidemiology: An Introduction. Philadelphia, Open University Press
Reference Books:
1. Dietetics – shrilakshmi
2. Advance Nutrition -IGNOU
3. Krause & Mahans - Krause's Food & the Nutrition Care Process, Janice L. Raymond and Kelly Morrow
4. Gibney M J, Margetts B M, Kearney J M Arab (IstEds) (2004) Public Health Nutrition NS Blackwell Publishing
5. Gopalan C (Ed) (1987) Combating Under nutrition- Basic Issues and Practical Approaches, Nutrition Foundation of India
6. Langseth L. (1996). Nutritional Epidemiology: Possibilities and Limitations. Washington DC, ILSI Press
7. Gordis L. Epidemiology. 5th ed. Philadelphia, PA: Saunders Elsevier, 2013
8. Aschengrau A., Seage G.R. (2014) Essentials of Epidemiology in Public Health. 3rd ed. Sudbury, MA: Jones & Bartlett
9. Willett, W. (2013) Monographs in Epidemiology and Biostatistics, Third Edition, Oxford University Press.
10. Achaya, K.T. (Ed) (1984) Interface Between Agriculture, Nutrition and Food Science, The United National University.
11. Beaton, G. H and Bengoa, J. M. (Eds) (1996) Nutrition in Preventive Medicine, WHO

Course code: FND42MML206	**Course name:** Fundamentals of Food Science – II
Course category: Major Mandatory	
Credits: 2 **Teaching scheme:** L-2	**Evaluation scheme:** CA–30, ESE–20
Exam Duration: 01 Hrs	
Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.	
Course Objectives:	
1. Understanding Food Composition: To comprehend the basic components of food, including macronutrients, micronutrients, water content, and additives.	
2. Exploring Food Processing Techniques: To learn about various methods used in food processing such as preservation, packaging, and thermal processing.	
3.Grasping Food Safety Principles: To understand the importance of food safety and hygiene practices to prevent foodborne illnesses.	
4.Studying Food Microbiology: To gain knowledge about microorganisms relevant to food science, including their roles in food spoilage, fermentation, and foodborne pathogens.	
5.Analyzing Food Quality and Nutrition: To develop skills in evaluating food quality parameters, nutritional content, sensory attributes, and factors affecting food stability	
Course Outcomes: At the end of the course, the students will be able to -	
CO1: Students understand the principles and fundamental concepts of food science.	
CO2: Students will be able apply the integrated acquired knowledge of food science concepts in health and nutrition.	
CO3: Students will gain the knowledge and acquire in-depth understanding of various food groups and their key constituents.	
CO4: Students will gain the insights of practical aspects of food groups in various fields.	
Contents –	

Unit	Content	Teaching hours
1	Nuts and Oilseeds- Type, Nutritive value and Function, its role and importance Beverages and Spices-Classification and Importance. Overview of Food toxins, Food Additives, Adulterants, Preservatives, Packaging.	7
2	Properties of foods: Physical properties(solutions, vapor pressure, boiling point, freezing point, osmotic pressure, viscosity, surface and interfacial tensions, specific gravity), Dispersion systems in of foods-Sol, Gel, Foam, Emulsion; Food preparation: Objective and method of cooking, cooking media, changes during cooking. Food pigments and colors: Some common pigments used in food industry (chlorophylls, myoglobin, anthocyanin, betalain, carotenoids, synthetic colors & lake /dye colors and other colorants); Flavours: types of flavour, flavour compounds, extraction principles of flavour, Sensation- smell sensation, texture sensation, visual appearance and sensation of taste.	8
3	Food additives: definition, need and classification of food additives, preservatives-Natural and Artificial, antioxidants, chelating agents, coloring agents, curing agents, Emulsions, flavours and flavour enhancers, leavening agents, nutritional supplements, non-nutritive sweeteners, pH control	7

	agents, stabilizer and thickeners, humectants anti-caking agents, firming agent, clarifying agent, flour bleaching agents	
4	An overview of digestion and absorption of food, Role of enzymes in digestion, regulators of gastrointestinal activity and hormonal mechanisms. Digestive process, absorptive mechanisms, digestion and absorption of nutrients. Factors affecting digestion of various foods and nutrients	8

Textbooks/Suggested Reading
1. Gisslen, W. (2017). Professional baking. John Wiley & Sons.
2. Edwards, W. P., & Magee, T. R. (2008). Bakery technology and engineering. Springer Science & Business Media.
3. Stauffer, C. E. (2015). Technology of biscuits, crackers and cookies (2nd ed.). Woodhead Publishing.
4. Cauvain, S. P. (2013). Baking problems solved. Elsevier.
5. Shamsuzzoha, A. H. M., & Hossain, M. (2016). Bakery products science and technology. CRC Press.
6. Rao, P. H., & Ananthanarayanan, V. S. (2009). Bakery products: Science and technology. Blackwell Publishing.
7. Rao, P. H., & Ananthanarayanan, V. S. (2011). Handbook of food products manufacturing: Principles, bakery, beverages, cereals, cheese, confectionery, fats, fruits, and functional foods. John Wiley & Sons
Reference Books :
1. Meyer, .L.H (1987). Food Chemistry. CBS Publishers
2. "Cereal Grains: Properties, Processing, and Nutritional Attributes" by Sergio O. Serna-Saldivar
3. "Bakery Products: Science and Technology" by Y. H. Hui
4. "Milk and Dairy Products in Human Nutrition" edited by R. Gibson and J. Kurpad
5. "Egg Science and Technology" by William J. Stadelman and Debbie Newkirk
6. "Cereal Chemistry and Technology" by Samuel A. Matz

Course code: FND42SEP201	**Course name:** Clinical Nutrition and Dietetics (Case Study)
Course category: Skill Enhancement course	
Credits: 2 **Teaching scheme:** P-4	**Evaluation scheme:** CA–30, ESE–20
Exam Duration: 02 Hrs	
Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.	
Course Objectives:	

1. Apply Theoretical Knowledge: Integrate theoretical knowledge of clinical nutrition and dietetics into practical case studies, fostering critical thinking and problem-solving skills.
2. Develop Assessment Skills: Enhance proficiency in conducting comprehensive nutritional assessments, including dietary intake analysis, anthropometric measurements, and biochemical evaluations.
3. Formulate Nutrition Plans: Practice formulating evidence-based nutrition intervention plans tailored to specific clinical conditions and patient needs, considering factors like age, medical history, and dietary preferences.
4. Implement Dietary Modifications: Gain experience in implementing dietary modifications and counseling strategies to address nutritional deficiencies, manage chronic diseases, and optimize patient outcomes.
5. Evaluate Outcomes: Learn to assess the effectiveness of nutrition interventions through monitoring and evaluating patient progress and adjusting treatment plans as necessary.

Lab Outcomes: At the end of the course, the students will be able to -

LO1: Student will be able to apply the acquired knowledge in various fields of study.

LO2: Students will be able to identify various assessment tools & methods.

LO3: Students will be able to develop enhanced skills for identification & diagnosis of various diseases.

LO4: Students will be able to do assessment of cases in both IPD and in community and plan effective therapy and interventions.

Contents –

Sr.No.	Title of the Experiment
1.	Standard operating procedure of lab
2.	Used different screening and assessments form for kids
3.	Used different screening and assessments form for Adults
4.	Used different screening and assessments form for Elderly
5.	Making a mini nutritional assessment short form.(For Diabetes, Heart disease and other Non – Communicable disease)
6.	Developing a food frequency questionnaire for collecting the diet history.
7.	Setting up a dummy unit for nutrition counselling in the class.

8.	Role play exercise for counselling.
9.	Enlist 5-8 simple message you would use for counselling adults about a healthy diet for them.
10.	Make a Assessment form, dietary guidelines and prepare nutritious recipes for a Pregnant women an exchange list for pregnant women.
11.	Plan a diet based on regional (Marathwada, Vidarbha, north Maharashtra) background for pregnant women.
12.	Make a diet chart for major religions patients in Maharashtra, India. (Maharashtrian, Marwadi, Gujrati, Jain, Muslim, Punjabi, Sindhi) case study – given by faculty
13.	Design and develop following population health and nutritional status assessment tools for investigation purpose
14.	Demonstrate anthropometric tools for infant and investigate a normal infant (male/ female) for the health and nutritional status and record the assessment. Investigate the infant for breastfeeding status and frequency.
15.	Demonstrate anthropometric tools for assessment of PEM and investigate children under 5 years for PEM cases.
16.	Investigate & diagnose the clinical signs & symptoms of following nutritional deficiencies & toxicities -PEM ,Anemia Diabetes , PCOD/PCOS
17.	Make a assessment form for adolescent girls
18.	Demonstrate anthropometric tools for adolescents visit schools and do assessment of adolescent boys and girls
19.	Plan few recipes for adolescent age group boys and girls (for tiffin)
20.	Preparation of recipes suggested for adolescent and calculation of recipes .

Reference Book / Hand Books/ Lab Manual
1. Applied Nutrition - Rajalakshmi R, Oxford and JBH Publishers
2. Nutrition and the community - Mc.Laren S, John Wiley & Sons
3. Extension Education - Reddy AA, Srilakshmi Press, Baptla
4. Education and Communication for development – OP Dahama and OP Bhatnagar, Oxford IBH Publishing Co.
5. Extension in rural communities - Savile AH, Oxford University Press

Course code: FND42MMP202	**Course name:** Dietary Assessment Techniques for Dieticians
Course category: Major Mandatory	
Credits: 1 **Teaching scheme:** P-2	**Evaluation scheme:** CA–30, ESE–20
Exam Duration: 02 Hrs	
Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.	
Course Objectives:	

1. Hands-on Training: Provide practical experience to dieticians in conducting various dietary assessment techniques, including food records, recalls, and frequency questionnaires.
2. Skill Development: Enhance skills in collecting accurate and reliable dietary data through direct observation, participant interviews, and food weighing methods.
3. Understanding Data Interpretation: Foster comprehension of dietary assessment data interpretation, including nutrient analysis, portion size estimation, and dietary pattern recognition.
4. Quality Assurance: Ensure proficiency in adhering to standardized protocols and quality assurance measures during dietary assessment procedures to minimize errors and bias.
5. Integration of Technology: Incorporate the use of technology-based tools and software for dietary assessment, such as digital food diaries and nutrition analysis software, to streamline data collection and analysis processes.

Lab Outcomes: At the end of the course, the students will be able to -
LO1: Students will be able to design assessment form.
LO2: Students will be able for patient counseling.
LO3: Develop food frequency questionnaire for collecting the diet history skills among dietetics students.
LO4: Students will be able to make a diet chart for adult pregnant women and lactating mother.

Sr.No.	Title of the Experiment
1.	Standard operating Procedure of laboratory
2.	Calculate RDA For Child 6 to 12 months and prepare a recipe of weaning food.
3.	Plan and prepare iron rich recipes and calculate their nutrients
4.	Make a food exchange list, diet chart and prepare a diet for 1- 6 years old child.
5.	Calculate RDA, make food exchange list and prepare a diet chart and recipe menu for a 7- 12 years old child.
6.	Calculate RDA, make food exchange list and prepare a diet chart and recipe menu for a 12- 18 and above years old
7.	Calculate RDA for adolescent

8.	Make exchange list and prepare a diet chart & recipe menu for an adolescent.
9.	Dietary Assessment- Multi-pass review and Practice
10.	Pediatric Assessment of Human Milk
11.	Infant formula calculations Pediatric Malnutrition
12.	Medical Record/Medical Terminology/Basic Skill
13.	Anthropometrics Assessment & Assessing the Prevalence of PEM
14.	Assessing Energy Needs/Energy Expenditure
15.	Biochemical Assessment of Nutritional Status
16.	Clinical and Dietary Assessment Malnutrition
17.	Nutrition Screening for Pediatric patients.
18.	To Make Ready to Eat Recipes.
19.	Market Survey for weaning food Formula.
20.	Visit a Anganwadi center or preschool and assess the nutritional problems in a child of 1 to 6 years.

Course code: FND42CEP201	**Course name:** Community Engagement Programme
Course category: Community Engagement Programme	
Credits: 2 **Teaching scheme:** P-4	**Evaluation scheme:** CA–30, ESE–20
Exam Duration: 02 Hrs	
Pre-requisites: The student should have basic knowledge of biological and applied sciences, and successfully completed the first year of the Degree Program.	
Course Objectives:	

1. Promoting Health Literacy: Enhance understanding of nutrition and dietetics principles within the community through interactive workshops, seminars, and educational campaigns.
2. Empowering Individuals: Empower individuals to make informed food choices by providing evidence-based nutrition information tailored to diverse cultural and socioeconomic backgrounds.
3. Addressing Nutritional Needs: Identify and address specific nutritional needs and challenges within the community, such as food insecurity, malnutrition, and diet-related chronic diseases.
4. Building Sustainable Practices: Advocate for sustainable food practices and community food systems, including promoting local agriculture, food preservation, and waste reduction initiatives.
5. Fostering Collaboration: Foster collaboration between nutrition professionals, community organizations, and policymakers to develop and implement effective nutrition programs and policies.

Lab Outcomes: At the end of the course, the students will be able to -

LO1: Increased Health Awareness: Participants demonstrate increased awareness and knowledge of nutrition and dietetics concepts, leading to improved health behaviors and outcomes.

LO2: Behavioral Change: Participants exhibit positive changes in dietary habits and lifestyle behaviors, incorporating nutrition recommendations into their daily lives.

LO3: Skill Development: Students acquire communication, counseling, and leadership skills necessary for effective community engagement and nutrition education delivery.

LO4: Community Impact: Community members experience improved access to nutritious foods, enhanced food security, and reduced prevalence of diet-related health conditions.

Sr.No.	Title of the Experiment
1	Physiology and Promotion of Health
2	Community Nutrition
3	Clinical Nutrition
4	Food Safety and Quality
5	Nutritional Assessment

Ideas of project:

Defining project ideas is crucial for setting realistic expectations and laying out a clear vision for a project life cycle. Project-based learning not only provides opportunities for students to collaborate or drive their own learning, but it also teaches them skills such as problem solving, and helps to develop additional skills integral to their future, such as critical thinking and time management.

Literature survey:

A literature review establishes familiarity with and understanding of current research in a particular field before carrying out a new investigation. Conducting a literature review should enable you to find out what research has already been done and identify what is unknown within your topic.

Performance:

Performance measurement during a project is to know how things are going so that we can have early warning of problems that might get in the way of achieving project objectives and so that we can manage expectations. The criteria of it as given below.

Implementation:

Follows closely the design, uses appropriate techniques with skill and understanding to produce a good solution.

Evaluation:

Clearly relates to the problem. Shows a good understanding and appreciation of the solution. Objectives of what has been done.

Project Log:

a. The individual student's effort and commitment.

b. The quality of the work produced by the individual student.

c. The student's integration and co-operation with the rest of the group.

d. The completeness of the logbook & time to time signature of guide

Objective: To elaborate the procedure for Guiding Student projects

Responsibility:

1. **All the Project Guide.**
2. **All Semester B.Sc. students**
3. **Project Heads**

PROCEDURE

SN	Activities	Responsibilities
1	PG students are deciding on their team members for their semester project with their proposed project domain and title	Project head, PG students
2	Director shall allocate the project guide based on their area of expertise (ot more than 3 batches to a guide)	Director
3	Ensuring that students have regular discussion meetings with their project guides.	Project guide Project head
4	Synopsis preparation and submission	Project head
5	Verification of student project log book	Project guide Project head
6	Approval of PPT: Abstract, existing, proposed system. 30% of proposed work. 80% of proposed work. 100% of proposed work.	Project guide
7	Preparation and submission of progress report during project	Students Project head
8	Preparing list for Redo students (insufficient content, plagiarism, poor presentation, genuine absentees.	Project head
9	Submission of hard copy of project report	Project head
10	Evaluation of project report	External examiner
11	Organizing final project viva-voce	Project heads
12	Ensuring that if a candidate fails to submit the project report on or before the specified deadline , he/she is deemed to have failed in the project work and shall re – enroll for the same	Project head Project guide Director