SCHOOL OF ARTS AND SCIENCE

Department of Food Science

B.Sc. Nutrition and Dietetics

SEMESTER V AND VI CURRICULUM (R2020)

SEMESTER –V										
S. No	Course Code	Course Title	Category	Periods			Credits	Max.Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20NDT515	Dietetics I	DSC	4	0	0	4	25	75	100
2	A20NDT516	Public Health Nutrition	DSC	4	0	0	4	25	75	100
3	A20NDT517	Food Product Development and Marketing	DSC	4	0	0	4	25	75	100
4	A20NDE507	Food Service Management	DSE	3	0	0	3	25	75	100
Practical										
5	A20NDL518	Dietetics I Practical	DSC	0	0	4	2	50	50	100
6	A20NDL519	Food Product Development	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
7	A20NDS505	In-Plant Training / Internship	SEC	0	0	4	2	100	0	100
							21	**300**	**400**	**700**

SEMESTER– VI										
S. No	Course Code	Course Title	Category	Periods			Credits	Max.Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20NDT620	Dietetics II	DSC	4	0	0	4	25	75	100
2	A20NDT621	Sports Nutrition	DSC	4	0	0	4	25	75	100
3	A20NDT622	Nutrition in Critical Care	DSC	3	1	0	4	25	75	100
4	A20NDE609	Health Psychology	DSE	3	0	0	3	25	75	100
Practical										
5	A20NDL623	Dietetics II Practical	DSC	0	0	4	2	50	50	100
6	A20NDP601	Project	DSC	0	0	10	5	40	60	100
Skill Enhancement Course										
7	A20NDS606	Basics in Research Methodology	SEC	0	0	4	2	100	0	100
							24	290	410	**700**

SEMESTER V AND VI SYLLABUS (R2020)

SEMESTER V

Department	**Food Science**	Programme: **B.Sc Nutrition and Dietetics**						
Semester	**Fifth**	Course Category Code: **DSC**			*En Type: **TE**			
Course Code	**A20NDT515**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name **DIETETICS – I**		**4**	**0**	**0**	**4**	**25**	**75**	**100**

Prerequisite	Diet management & Role of Dieticians	
Course Objectives	1. To provide comprehensive knowledge on principles and planning of therapeutic diets.	
	2. To determine the knowledge on nutritional needs of febrile conditions.	
	3. To acquire knowledge on nutritional needs of Gastro intestinal diseases.	
	4. To determine the nutritional support for Liver disorders.	
	5. To identify the knowledge on dietary management for Inborn errors of metabolism.	

Course Outcome	**On completion of the course, the students will be able to**		BT Mapping (Highest Level)
	CO1	Get an idea about the concept of therapeutic diet .	**K2**
	CO2	Identified the dietary management for febrile patients.	**K3**
	CO3	Understand the dietary principles for gastro intestinal diseases	**K3**
	CO4	Understand the role played by dietary measures to recover liver disorders	**K3**
	CO5	Get acquainted with nutritional support for Inborn errors of metabolism.	**K3**

UNIT-I	**Diet Therapy**	**Periods: 12**	
Dietetics - Definition, History of Dietetics, Objectives and Principles of Diet Therapy . a) Classification of Therapeutic Diets - Routine Hospital Diet – Clear liquid diet, Full fluid diet/liquid diet, Semi-solid diet, Soft diet, Bland diet, High & Low-calorie diet, High & Low protein diet, High & Low fiber diet, Low cholesterol diet. b) Adjuncts to Diet Therapy – Physical Activity, Exercise, Yoga and Stress Management.			**CO1**
UNIT-II	**Diet in Fever and Infectious Disease**	**Periods: 12**	
Febrile Condition – Overview Diagnosis, Causes, Symptoms, Dietary Management of Febrile conditions – Typhoid, influenza, malaria, tuberculosis, AIDS.			**CO2**
UNIT-III	**Diet in Gastro Intestinal Disease**	**Periods: 12**	
Gastrointestinal Diseases – Overview Diagnosis, Causes, Symptoms, Dietary management for: a. Upper Gastro Disease – Gastro Esophageal Reflex Disease (GERD), Indigestion, Peptic Ulcer, Gastri c Surgery. b. Intestinal Diseases – Constipation, Diarrhea, Dumping Syndrome, and Diverticular Disease. c. Inflammatory Bowel Diseases - Ulcerative Colitis - Crohn's Disease, Irritable BowelSyndrome, Intestinal gas and flatulence.			**CO3**
UNIT-IV	**Diet in Liver and Gall Bladder Diseases**	**Periods: 12**	
Liver – Functions of Liver, Factors responsible for liver damage , Liver Diseases - Infective hepatitis, Cirrhosis of liver, Hepatic Encephalopathy - Overview Diagnosis, Causes, Symptoms, Dietary management. Gall Bladder Diseases - Cholecystitis, Cholelithiasis.			**CO4**

UNIT-V	**Inborn Errors of Metabolism**	**Periods: 12**	
	Inborn Errors of Metabolism – Dietary Management for Phenylketonuria, Galactosaemia, Fructosuria, Fructose – 1,6, Biphosphatase Deficiency, Menke's Disease and Wilson's Disease.		**CO5**
Lecture Periods: 60	**Tutorial Periods: -**	**Practical Periods: -**	**Total Periods: 60**

Text Books

1. Srilakshmi, B., Nutrition Science, New Age International (P) Ltd., New Delhi, 2017.
2. Mahtab, S, Bamji, Kamala Krishnasamy, G.N.V. Brahmam, Text Book of Human Nutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi, 2015
3. Swaminathan, M., Advanced Textbook on Food and Nutrition, Vol. 1, Second Edition, Bangalore Printing and Publishing Co. Ltd., Bangalore, 2015.

Reference Books

1. Dietary Guidelines for Indians, ICMR, National Institute of Nutrition, Hyderabad, 2011.
2. Gordon M. Wardlaw, Paul M.Insel, Perspectives in nutrition 11th edition, Mosby- year Book,Inc.St.Louis,Missouri, 2019
3. Cornne H. Robinson Marilyn R. Lawler, Normal and Therapeutic Nutrition, Mac MillanPublishing Company, New York, 1986.
4. F.P. Antia, Clinical Dietetics and Nutrition, Oxford University press, 1989.
5. Krause, M.V. and Hunesher, M.A., Food, Nutrition and Diet Therapy, 14th Edition, W.B. Saunders Company, Philadelphia, London, 2016.

Web References

https://bowenstaff.bowen.edu.ng/lectureslides/1611582925.pdf
https://naturallyyours.in/blogs/blog/nutritional-management-in-fever https://medlineplus.gov/ency/article/002441.htm
https://liverfoundation.org/health-and-wellness/healthy-lifestyle/liver-disease-diets/

* TE – Theory Exam, LE – Lab Exam

Department	**Food Science**	Programme: **B.Sc Nutrition and Dietetics**						
Semester	**Fifth**	Course Category Code: DSC			*End Semester Exam Type: **TE**			
Course Code	**A20NDT516**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**PUBLIC HEALTH NUTRITION**	**4**	**0**	**0**	**4**	**25**	**75**	**100**

Prerequisite	**Basic knowledge in community health nutrition and deficiency disorders**		
Course Objectives	1. Identify the concepts and scope of Public health and community nutrition		
	2. Determine the nutritional problems		
	3. Determine the nutritional status of the community		
	4. Identify the hazards in community health.		
	5. Identify the preventive measures.		
Course Outcome	**On completion of the course, the students will be able to**		BT Mapping (Highest Level)
	CO1	Get an idea about the concepts and scope of Public health and community nutrition	**K2**
	CO2	Identified the nutritional problems in India.	**K3**
	CO3	Understand the steps to identify the nutritional status of the community	**K3**
	CO4	Determined the various hazards in community health	**K4**
	CO5	Get acquainted with the preventive measures taken by the Government	**K3**

UNIT-I	**Introduction to Public Health Nutrition**	**Periods: 12**	
Introduction, concepts, scope of public health and community nutrition, Global Public Health Nutrition (PHN), definition, PHN training and workforce, PHN positions and career settings, PHN future trends. Nutrition and Health in National Development, Role of Nutritionist in improving community.			**CO1**
UNIT-II	**Nutritional problems confronting the community**	**Periods: 12**	
Protein Energy Malnutrition- Prevalence, etiology, clinical features and prevention through food sources. Iron Deficiency Anemia- prevalence, etiology, clinical features, prophylaxis programme and prevention through food sources. Iodine Deficiency Disorder- prevalence, etiology, clinical features and prevention through food sources. Fluorosis- prevalence, etiology, clinical features and prevention. Vitamin A deficiency- prevalence, etiology, clinical features, prophylaxis programme and prevention through food sources. Vitamin D deficiency - prevalence, etiology, clinical features and prevention through food sources.			**CO2**
UNIT-III	**Determination of consumption and nutritional status of the community**	**Periods: 12**	
Nutrition and Behavior - Factors affecting food habits and food behavior Improvement of nutrition in community - fortification, conservation and education Weaning foods-planning, formulating and preparing importance of correct and timely weaning - Review.			**CO3**
UNIT-IV	**Nutrition Epidemiology Research Methods**	**Periods: 12**	
Epidemiology –Concept, approaches, types and significance. Principles of Nutritional Epidemiology. Measurement issues. Epidemiology of communicable and non-communicable diseases. Research methods and Study Design in Nutritional Epidemiology.			**CO4**
UNIT-V	**Nutrition intervention programs to Combat Malnutrition**	**Periods: 12**	

National organizations- ICMR-NIN, ICAR, CHEB, CSWB, SSWB, NNMB, CFTRI, DFRL, NFI and NIPCCD. International organizations- FAO, WHO, UNICEF, WFP, CARE, GAIN, AFPRO, CWS, CRS, and World Bank. Economics of Nutrition. Malnutrition and its economic consequences. Food security. Food production and food pricing. Recent advances in community nutrition research- Fortification & enrichment of foods.	**CO5**

Lecture Periods: 60	**Tutorial Periods: -**	**Practical Periods: -**	**Total Periods: 60**

Text Books

1. Boyle M.A.(2021). Community Nutrition in Action. 8th Edition. Cengage Learning, USA.
2. Steyn N. and Temple N.J. (2016). Community Nutrition for Developing Countries. Athabasca University Press, Canada.
3. Park K. (2021). Textbook Of Preventive And Social Medicine, 26th Edition. Banarsidas Bhanot Publisher, Madhya Pradesh, India.

Reference Books

1. Gibney M.J., Margetts B.M., Kearney J.M., Arab L. (2015). Public Health Nutrition. John Wiley and Sons, New York.
2. Stein N. (2014). Public Health Nutrition- Principles and Practice in Community and Global Health. Jones and Bartlett Learning, LLC Publishers, U.S.A.
3. Welch A.A., Kearney J.M., Buttriss J.L. and Lanham S.A. (2017). Public Health Nutrition, 2nd Edition. Wiley, U.K.
4. Nutrition- Concepts and Controversies, by Sizer F.S. and Whitney E, 15th Edition, 2016, Wadsworth Cengage Learning, USA.
5. Understanding Nutrition, by Whitney E. and Rolfes S.R,11th Edition, 2018, Wadsworth Cengage Learning, USA.

Web References

https://www.godigit.com/health-insurance/nutrition/nutritional-problems-in-india
https://www.mdsuajmer.ac.in/econtents/846_nutritional%20problems%20in%20India.pptx
https://www.researchgate.net/publication/317305228_NUTRITIONAL_PROBLEMS_in_India_world_ways_to_combat

* TE – Theory Exam, LE – Lab Exam

Department	**Food Science**	Programme: **B.Sc Nutrition and Dietetics**						
Semester	**Fifth**	Course Category Code: DSC			*End Semester Exam Type: **TE**			
Course Code	**A20NDT517**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**FOOD PRODUCT DEVELOPMENT AND MARKETING**	**4**	**0**	**0**	**4**	**25**	**75**	**100**

Course Objectives	**1.** To understand and know various aspects of food product development including Food Science and Technology	
	2. To understand the principles in product development and design	
	3. To identify the generation of new product ideas.	
	4. To understand the different steps involved in testing and evaluation.	
	5. Develop entrepreneurship skills for setting up small scale food industries	
Prerequisite	Product development, consumer view on food products and sensory evaluation	
Course Outcome	**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1 Identified various aspects of food product development including Food Science and Technology	**K2**
	CO2 Get acquaintance with the principles in product development and design	**K3**
	CO3 Frame the generation of new product ideas.	**K3**
	CO4 Understand the different steps involved in testing and evaluation.	**K4**
	CO5 Develop entrepreneurship skills for setting up small scale food industries	**K3**

UNIT-I	**Introduction to Food Product Development**	**Periods: 12**
New Food Product development, Phases in Food Product Development. Definition, classification, characterization, Factors in fluency new product development – social concerns, health concerns impact of technology and market place influence (Corporate, market place, technological and governmental influences). Trends in Social Change as a base for New Product Development.		**CO1**

UNIT-II	**Recipe Development**	**Periods: 12**
Traditional Foods, Weaning Foods, Convenience Foods, RTE, RTS, Extruded Foods, IMF Foods, Nutritional Supplements, Functional Foods, Neutraceuticals and Designer Foods, Plant Proteins – Emerging Foods, Alternate to meat Proteins, Sports foods, Foods for Defence services, Space Foods. Newer techniques adopted in product development.		**CO2**

UNIT-III	**Generation of New Product Ideas**	**Periods: 12**
Internal sources of ideas-census data, magazine, reward cards, surveys. Polling, membership list, seller/retailer and distributor, telephone and mails. External sources of ideas –competitors, food conference/exhibition, tradeshows and research symposia, public libraries, trade literature, government publications. Market place analysis, SWOT analysis		**CO3**

UNIT-IV	**Screening and Evaluation**	**Periods: 12**	
Screening and refining the screening procedure for the product-Objectives of screening. Standardization, Portion Size and Control -Sensory Evaluation - Shelf life testing. Nutrient Analysis. Food standards needed to introduce new product.			**CO4**
UNIT-V	**Marketing of Food Products**	**Periods: 12**	
Market Sector perspective and market research, Cost Calculation, Advertising methods, Product Sales, Product License, Legal specifications, Consumer Behaviour and Acceptance – Institutional Support for Entrepreneurship Development			**CO5**
Lecture Periods: 60	**Tutorial Periods: -**	**Practical Periods: -**	**Total Periods: 60**

Text Books

1. Srilakshmi, B. Second Edition, Food Science, New Age International (P) Limited Publishers, New Delhi. 2016
2. Harry T. Lawless, Hildegarde, Sensory Evaluation of Food Principles and Practices, Second Edition, Springer Science, 2010.
3. Joshi, V.K Sensory Science: Principles and Applications in Food Evaluation, 2016.

Reference Books

1. Hutenwigs, B.J. Food Color and Appearance, Published by Blackie Academic and Professional, London, 2010.
2. Howard R. Beckley, Jacquiline, H. Sensory and Consumer Research in Food Product Design and Development, 2016
3. Sadasivam, S. and Manickam, A. Biochemical Method, Second Edition,New Age International P. Ltd., Publishers, New Delhi, 2013.
4. Raghuramulu, N., Madhavannair, K. and Kalyana Sundaram, National Institute of Nutrition, 2013, A Manual of Laboratory Techniques, Hyderabad, 500007
5. Bi, Jian, Sensory Discrimination Tests and Measurements: Statistical Principles, Procedures and Tables, 2016.

Web References

https://www.foodresearchlab.com/what-we-do/new-product-development-service/new-food-product-development/
https://www.foodresearchlab.com/what-we-do/new-product-development-service/
https://www.sciencedirect.com/book/9781845697228/food-product-development
http://niftem-t.ac.in/food_product_development.php

* TE – Theory Exam, LE – Lab Exam

Department	**Food Science**			Programme: **B.Sc Nutrition and Dietetics**				
Semester	**Fifth**			Course Category Code: DSE		*End Semester Exam Type: **TE**		
Course Code	**A20NDE507**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**FOOD SERVICE MANAGEMENT**	**3**	**0**	**0**	**3**	**25**	**75**	**100**

Course Objectives	1.	Gain knowledge about various types of food services.
	2.	Determine the food management process.
	3.	Identify the various food trends and service.
	4.	Understand the kitchen layout and equipments.
	5.	Gain knowledge about the principles and functions of Management.
Prerequisite	Food service, food production, menu planning, purchase and storage.	

Course Outcome	**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1 Understand the types of food services	**K2**
	CO2 Acquired knowledge about the food production and management.	**K3**
	CO3 Understand the various food trends and service.	**K3**
	CO4 Understand the procedures for selection and use of equipments and layout	**K2**
	CO5 Get acquainted with the pprinciples and functions of Management.	**K3**

UNIT-I	**Food Service Institutions**	**Periods: 09**
Review of different types of institutional food service in operation - Commercial and Non- commercial - classification based on functional – profit oriented, service oriented and public health facility oriented food Service Institutions. Food Service – Formal and Informal types, Styles of Food Service – Centralized and Decentralized System of Service.		**CO1**
UNIT-II	**Food Management**	**Periods: 09**
Food management- Characteristics of foods, nutritional knowledge, food purchase, inventory management, menu planning, food production, food service, waste management. Need based specific units- Dietary, catering, institutional food service.		**CO2**
UNIT-III	**Food Services and its Trends**	**Periods: 09**
Styles of food service – Color, Table service, furnishing, packing services, service stations – hospitals, restaurants, hotels, Motels, food courts and catering services. Services - banquet and party setting and services, therapeutic diets, home remedies, traditional cookery, international cuisines, current trends- air catering, food service at old age homes, community kitchens, railway catering, robotic food service, virtual food service.		**CO3**
UNIT-IV	**Kitchen Layout and Equipments**	**Periods: 09**
Kitchen space, storage space, service areas, Factors affecting Planning of different work areas Equipment: Types, selection, purchase, design, installation, operation and maintenance.		**CO4**
UNIT-V	**Organization and Management**	**Periods: 09**

Management –Principles, Functions and tools of Management Personnel Management - Recruitment, Selection, Induction, Employee facilities and benefits. Training, Motivation and Leadership .	**CO5**

Lecture Periods: 45	**Tutorial Periods: -**	**Practical Periods: -**	**Total Periods: 45**

Text Books

1. Mohini Shetty, Institutional food management, New age International Publishers, 2016.
2. West ,BB, Wood "Food service in Institutions" ,Johnwiley & Sons,New York ,2015.
3. Sethi and Mahan S.-Catering Management and integrated approach, Johnwiley & Sons,New York,2010 .

Reference Books

1. Kotschevar, L. H. and Terrel, M. E. (1997). Food Service Planning: Layout and Equipment.John Wiley.
2. Minor, L. J., Cichy, R. F. (1984). Food Service Systems Management, Connecticut AVI Publ .
3. Kazarian, E. A. (1989). Food service facilities planning 3rd ed. New York. Van Nostrandand Reinhold.

Web References

https://www.ecpi.edu/blog/what-is-food-service-management-and-why-do-i-need-a-degree- for-it https://www.scitechnol.com/scholarly/food-service-management-journals-articles-ppts-list.php https://ziphaccp.com/en/food-service/food-service-management.html

* TE – Theory Exam, LE – Lab Exam

Department	**Food Science**	Programme: **B.Sc Nutrition and Dietetics**						
Semester	**Fifth**	Course Category Code: DSC			*End Semester Exam Type: L**E**			
Course Code	**A20NDL518**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**DIETETICS – I PRACTICAL**	**0**	**0**	**4**	**2**	**50**	**50**	**100**

Prerequisite	Diet Planning, Therapeutic Diet		
Course Objectives	To enable the students to 1. To deliver better understanding on the basic principles in diet planning. 2. To promote skills and techniques in planning and preparation of therapeutic diets for various disease conditions.		
Course Outcome	**On completion of the course, the students will be able to**		BT Mapping (Highest Level)
	CO1	Understand the basic principles involved in planning diets for different disease conditions.	**K3**
	CO2	Plan and prepare diets to meet out the quality and quantity requirements for specific disease conditions	**K3**
	CO3	Acquire practical knowledge of therapeutic diet to meet the requirement	**K3**

Experiments — **Practicals - 30 hrs**

Planning and Preparation of diet in:

1. Routine Hospital Diets
2. Febrile conditions
3. Gastrointestinal Disease
4. Liver and Gall bladder disease
5. Addictive patient.

Text Books

1. Srilakshmi, B., Nutrition Science, New Age International (P) Ltd., New Delhi, 2017.
2. Mahtab, S, Bamji, Kamala Krishnasamy, G.N.V. Brahmam, Text Book of Human Nutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi, 2015
3. Swaminathan, M., Advanced Textbook on Food and Nutrition, Vol. 1, Second Edition, Bangalore Printing and Publishing Co. Ltd., Bangalore, 2015.

Reference Books

1. Dietary Guidelines for Indians, ICMR, National Institute of Nutrition, Hyderabad, 2011.
2. Gordon M. Wardlaw, Paul M.Insel, Perspectives in nutrition 11th edition, Mosby- year Book,Inc.St.Louis,Missouri, 2019
3. Cornne H. Robinson Marilyn R. Lawler, Normal and Therapeutic Nutrition, Mac MillanPublishing Company, New York, 1986.
4. F.P. Antia, Clinical Dietetics and Nutrition, Oxford University press, 1989.
5. Krause, M.V. and Hunesher, M.A., Food, Nutrition and Diet Therapy, 14th Edition, W.B. Saunders Company,

Philadelphia, London, 2016.

Department	**Food Science**	Programme: **B.Sc Nutrition and Dietetics**						
Semester	**Fifth**	Course Category Code: DSC			*End Semester Exam Type: L**E**			
Course Code	**A20NDL519**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**FOOD PRODUCT DEVELOPMENT PRACTICAL**	**0**	**0**	**4**	**2**	**50**	**50**	**100**

Prerequisite	New Product Development and Sensory Evaluation
Course Objectives	To enable the students to 1. To develop skills in product development 2. To understand the steps involved in costing 3. To learn sales techniques

Course Outcome	**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
CO1	Identify suitable food groups for developing products	**K3**
CO2	Categorize the foods for developing recipes and preserved foods	**K3**
CO3	Understand the steps involved in the preparation of a new food product	**K3**
CO4	Standardize the developed food product for large scale cooking	**K3**
CO5	Learn marketing techniques and launch the developed products.	**K3**

Experiments **Practicals - 30 hrs**

Product Development and Standardization

1. Sensory evaluation of developed products using hedonic scales.
2. Cereal and Millet based foods
3. Health foods and nutritional supplements
4. Weaning foods
5. Convenience foods, RTS and RTE foods
6. Visit to food production and packaging unit of food industry

Text Books

1. Sudhir Gupta (2007). Handbook of Packaging Technology, Engineers India Research Institute, New Delhi
2. Khanaka, S.S., Entrepreneurial Development, S.Chand and Company Ltd, New Delhi, 2006.
3. Suja ,R.Nair(2014). Consumer Behaviour and Marketing Research, 1st edition, Himalaya publishers.

Reference Books

1. Hmacfie, (2007). Consumer led food Product Development, Weedhead publishing ltd., UK
2. Fuller, Gordon, W(2005). New Food Product Development, 2nd edition, CRC press, Boca, Raton, Florida,
3. Schaffner. D,J,Schroder, W.R.(2010). Food Marketing and International perspectives, web/ Mc Graw Hill Publication.

Department	**Food Science**	Programme: **B.Sc Nutrition and Dietetics**						
Semester	**Fifth**	Course Category Code: DSC			*End Semester Exam Type: L**E**			
Course Code	A20NDS505	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**INPLANT TRAINING / INTERNSHIP**	**0**	**0**	**4**	**2**	**50**	**50**	**00**
Prerequisite	Diet Planning, Therapeutic Diet							
Course Objectives	To enable the students to 1. Acquire knowledge about the preparation of diet chart, routine hospital diet. 2. Understand the supportive services available in hospital.							

INTERNSHIP:

Dietary Department: Students are expected to complete 30 days of training at the dietarydepartment including ward visits for case study

Support Services: Students are expected to complete 5 days of observational visits atLaboratory & Blood Bank

SUBMISSION OF CASE REPORT:

It includes (should be submitted to the respective institution)

- Brief description of the Hospital & dietary department (10 pages)
- Short report on the training undergone in Laboratory & Blood Bank(5 pages)
- Case study - **ONE** Patient (10 pages)
- Cover to cover – 25 pages
- Inclusive of graph, diagrams, pictures etc
- Times New Roman – font 1.1/2 spacing, 12 – font size
- Soft binding, certified by HOD.

Evaluation Method

Assessment	**Continuous Assessment Marks (CAM)**		**End Semester Examination (ESE) Marks**	**Total Marks**
	CAT 1	**CAT 2**		
Marks	50		50 (presentation – 40, viva -10)	100

***** Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

SEMESTER VI

Department	**Food Science**			Programme: **B.Sc Nutrition and Dietetics**				
Semester	**Sixth**			Course Category Code: DSC		*End Semester Exam Type: **TE**		
Course Code	**A20NDT620**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**DIETETICS - II**	**4**	**0**	**0**	**4**	**25**	**75**	**100**

Prerequisite	Nutrition and Diseases
Course Objectives	1. Provide comprehensive knowledge on role and need of dietician.
	2. Assess formulate & prepare diet for specific conditions of life style disorder
	3. Acquire knowledge on nutritional needs of Diabetes Mellitus.
	4. Determine the nutritional support for Cardiac disorders.
	5. Acquire the knowledge on dietary management for renal and special cases.

Course Outcome	**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1 Get an idea about the role of dietician	**K3**
	CO2 Identified the dietary management for obesity andunderweight.	**K3**
	CO3 Understand the dietary management for diabetes mellitus	**K3**
	CO4 Understand the role played by dietary measures to recover cardiacdisorders	**K3**
	CO5 Get acquainted with nutritional support for renal special case patients.	**K3**

UNIT-I	**The Dietician**	**Periods: 12**
Dietician: Definition; Educational Qualification of Dietician, Types and Role of dietician, Difference between registered dietician & Nutritionist, tools used by dietician. Indian Dietetic Association, Requirements for Registered Dietitian.		**CO1**
UNIT-II	**Diet in Obesity and Underweight**	**Periods: 12**
Aetiology, Role of Hormones, Assessment and Grades, Types, Treatment , Complications and Guidelines. Addictive Behavior - Anorexia Nervosa & Bulimia Nervosa		**CO2**
UNIT-III	**Diet in Diabetes Mellitus**	**Periods: 12**
Diabetes Mellitus - Aetiology, Types, Clinical Symptoms and treatment of Diabetes Mellitus (in brief). Diabetic complications – Cataract and Retinopathy, Neuropathy, Nephropathy, Diabetic Coma, Hypoglycemia and Ketoacidosis.		**CO3**
UNIT-IV	**Diet in Cardiovascular disease**	**Periods: 12**
Cardiovascular Diseases - Aetiology, Clinical Symptoms, Diagnosis and Treatment of Hypertension, Hyperlipidemia, Atherosclerosis, Ischemic Heart Disease.		**CO4**
UNIT-V	**Diet in Renal and Specific disease**	**Periods: 12**
Kidney Diseases - Aetiology, Clinical Symptoms, Diagnosis and Treatment of Glomerulonephritis, Nephrosis, Acute Renal Failure, Chronic Renal Failure.		**CO5**

Lecture Periods: 60	**Tutorial Periods: -**	**Practical Periods: -**	**Total Periods: 60**

Text Books

1. Raheena Begum. M., A Text book of Foods, Nutrition and Dietetics, Sterling PublishersPvt., Ltd 1991

2. Srilakshmi. B, Dietetics, New age international (Pvt Ltd.,) 2000
3. Subhangini. A. Joshi, Textbook of Nutrition and Dietetics, Tata Mc Graw hill publishinglimited, 1992

Reference Books

1. Dietary Guidelines for Indians, ICMR, National Institute of Nutrition, Hyderabad, 2011.
2. Gordon M. Wardlaw, Paul M.Insel, Perspectives in nutrition 11th edition, Mosby- year Book,Inc.St.Louis,Missouri, 2019
3. Cornne H. Robinson Marilyn R. Lawler, Normal and Therapeutic Nutrition, Mac MillanPublishing Company, New York, 1986.
4. F.P. Antia, Clinical Dietetics and Nutrition, Oxford University press, 1989.
5. Krause, M.V. and Hunesher, M.A., Food, Nutrition and Diet Therapy, 14th Edition, W.B. Saunders Company, Philadelphia, London, 2016.

Web References

https://health.clevelandclinic.org/metabolic-syndrome-diet/
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1783583/ https://www.sanitarium.com.au/health-nutrition/nutrition/foods-that-fight-lifestyle-diseases
https://www.un.org/en/chronicle/article/lifestyle-diseases-economic-burden-health-services

* TE – Theory Exam, LE – Lab Exam

Department	**Food Science**	Programme: **B.Sc Nutrition and Dietetics**						
Semester	**Sixth**	Course Category Code: DSC			*End Semester Exam Type: **TE**			
Course Code	**A20NDT621**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**SPORTS NUTRITION**	**4**	**0**	**0**	**4**	**25**	**75**	**100**

Prerequisite	Nutrition for Sports Person	
Course Objectives	1. Develop an understanding the concept of Sports Nutrition	
	2. Obtain an insight about the physiology of exercise.	
	3. Understand the role played by the macro nutrients	
	4. Understand the importance of water and electrolytes.	
	5. Know the nutritional support for sports person.	
Course Outcome	**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1 Get an idea about the concept of SportsNutrition	**K2**
	CO2 Acquaint the knowledge of exercise physiology	**K3**
	CO3 Understand the role of macro nutrients.	**K2**
	CO4 Understand the importance of water and electrolytes	**K3**
	CO5 Get acquainted with nutritional support for sports person	**K4**

UNIT-I	**Introduction to Sports Nutrition**	**Periods: 12**	
Introduction to Sports Nutrition- Definition - Scope - Importance of Sports Nutrition Physical Fitness - Types of Fitness - Components of Physical Fitness – Methods and Benefits, Exercise - Types and Factors affecting - Exercises to strengthen different parts of the body			**CO1**
UNIT-II	**Physiology of Exercise, Bioenergetics and Metabolic Responses**	**Periods: 12**	
Physiology of Exercise - Fuels for Exercise - Carbohydrates -Fats - Proteins - High-Energy Phosphates, Bioenergetics - Anaerobic ATP Production - Aerobic ATP Production -Aerobic ATP Tally, Energy Requirements at Rest - Rest-to-Exercise Transitions - Recovery from Exercise: Metabolic Responses - Metabolic Responses to Exercise: Biomechanics - Muscular Adaptations to Exercise– Endurance and Resistance Training - Cardio-Pulmonary adaptations to Exercise - Effects of Training on Cardio-Pulmonary System.			**CO2**
UNIT-III	**Nutritional Recommendations**	**Periods: 12**	
Carbohydrates, Proteins and Fats in sports: - during training, during different phases of Preparation, General preparatory phase, Specific preparatory phase, Competition phase, Transition phase, Injury and rehabilitation phase - Pre competition nutrition - Post competition nutrition			**CO3**
UNIT-IV	**Hydration and Electrolytes**	**Periods: 12**	
Hydration - Pre competition Hydration, The Week before, the day before, on the day. Electrolytes - Role of electrolytes in Muscular contraction- Electrolyte loss & exercise -Maintaining / Restoring electrolyte Balance - Sports & Energy drinks - Osmolality & osmolarity - Hypotonic, Isotonic, Hypertonic - Acclimatization - Non Alcoholic Beverages .			**CO4**
UNIT-V	**Food Supplements**	**Periods: 12**	

Ergogenic Aids and Supplements - Sports Foods - Cereal Bar, Sports Drinks, Carbohydrate Gels, Liquid Meal Replacements ,Use of Performance Enhancing Substances among Athletes - Anabolic Steroids, Types of Protein Supplements - Creatinine, Beta- Alanine, Glutamine, Branched Chain Amino Acids, Beta Hydroxyl Beta Methyl Butyrate(HMB), Whey Proteins, Caffeine, Glycerol, Bicarbonate, Citrate, World Anti- doping Agency (WADA) - Anti Doping Rules and Regulations.	**CO5**

Lecture Periods: 60	**Tutorial Periods:**	**Practical Periods: -**	**Total Periods: 60**

Text Books

1. Mcardle W. D. (2018). Sports and Exercise Nutrition, 5th Edition, Lippincott Williams and Wilkins, North America.
2. Burke L. (Author), Deakin V. (2015). Clinical Sports Nutrition. McGraw Hill, Australia.

Reference Books

1. Melvin H.Williams, Nutrition for Health, Fitness and Sports, 7th edition, McGraw Hill International Edition, 2005
2. Micheal J.Gibney, Ian A Macdonald and Helen M.Roche, Nutrition and Metabolism,Blackwell Publishing Company, Bangalore, Reprint 2004.
3. Mc Ardle Katch & Katch, Nutrition, Health & Fitness, Williams & Wilkins, A.Waverly Company
4. Srilakshmi. B, Suganthi. V, Ashok, K.C, Exercise Physiology, Fitness and Sports Nutrition,New Age International, New Delhi, 2017.

Web References

https://www.physio-pedia.com/Sports_Nutrition

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3805623/

https://www.nutrition.gov/topics/basic-nutrition/eating-exercise-and-sports

* TE – Theory Exam, LE – Lab Exam

Department	**Food Science**			Programme: **B.Sc Nutrition and Dietetics**				
Semester	**Sixth**			Course Category Code: DSC			*End Semester Exam Type: **TE**	
Course Code	**A20NDT622**			Periods / Week			Credit	Maximum Marks
				L	T	P	C	CAM	ESE	TM
Course Name	**NUTRITION IN CRITICAL CARE**			**4**	**0**	**0**	**4**	**25**	**75**	**100**
Prerequisite	Nutritional Care									
Course Objectives	1. Develop an understanding the concept of nutritional care.									
	2. Obtain an insight into the Enteral Nutrition and feeding procedures.									
	3. Obtain an insight into the Parenteral Nutrition									
	4. Understand the importance of Pharmaconutrition									
	5. Know the nutritional support for critical ill patients.									
Course Outcome	**On completion of the course, the students will be able to**									BT Mapping (Highest Level)
	CO1	Get an idea about the concept of nutritionalcare								**K3**
	CO2	Acquaint the knowledge of enteral nutrition.								**K3**
	CO3	Understand the infusion techniques of parenteralnutrition								**K3**
	CO4	Understand the importance of Pharmaconutrition								**K3**
	CO5	Get acquainted with nutritional support for ICU patients								**K3**
UNIT-I	**Concept of Nutrition Care**						**Periods: 12**			
Introduction to Nutrition Care Process - Definition, Steps in nutrition care process, NutritionAssessment - Nutritional Intervention – Definition, Objectives. Nutritional Monitoring and Evaluation – Definition, Components, Objectives, and Evaluation of nutrition care										**CO1**
UNIT-II	**Enteral Nutrition**						**Periods: 12**			
Enteral Nutrition – Indications, Monitoring - Administration and Methods – Nasogastric,Gastrostomy, Jejunostomy - Types of food - Infusion Techniques - Complications.										**CO2**
UNIT-III	**Parenteral Nutrition**						**Periods: 12**			
Parenteral Nutrition – Indications, Monitoring - Administration – Types of Infusion, TPN formula – Complications										**CO3**
UNIT-IV	**Pharmaconutrition**						**Periods: 12**			
Pharmaconutrition – an evaluation of the specific issues surrounding - selection and supplementation of Macro nutrients and Micro nutrients such as fish oil, glutamine and antioxidants										**CO4**
UNIT-V	**Nutrition support for Critical ill patients**						**Periods: 12**			
Introduction, Definition - Critically ill patient, Nutritional Changes during critical illness - Acute Phase Response, Hormonal Response, Catabolism and Urea Nitrogen - Nutrition support - Energy requirements, Protein requirements, Commencement of Enteral and Parenteral Nutrition - .for ICU patients (brief explanation).										**CO5**
Lecture Periods: 60		**Tutorial Periods: -**			**Practical Periods: -**			**Total Periods: 60**		

Text Books			
1. Rajkumar .R & Vinod . B Patel, Diet and Nutrition in Ctitical Care. Living ReferenceWork (2020). 2. Cynober . L& Moore . F.A., Nutrition in Critical Care. Nestle Nutrition InstituteWorkshop: Vol8 (2013). 3. Subhal . D, Principles in Critical Care Nutrition. Jaypee BrothersMedical Publications(2019).			
Web References			
http://www.criticalcarenutrition.com Nutrition therapy in critical illness: a review of the literature for clinicians | Critical Care | Full Text (biomedcentral.com) https://www.sciencedirect.com/science/article/abs/pii/S0261561415001			

* TE – Theory Exam, LE – Lab Exam

Department	**Food Science**	Programme: **B.Sc Nutrition and Dietetics**						
Semester	**Sixth**	Course Category Code: DSE			*End Semester Exam Type: **TE**			
Course Code	**A20NDE609**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**HEALTH PSYCHOLOGY**	**3**	**0**	**0**	**3**	**25**	**75**	**100**
Prerequisite	Health and Psychology							
Course Objectives	**1.** To understand the psychological and other factors contributing to health issues.							
	2. To identify the problematic health behaviors							
	3. To organize various factors influencing the practice of health behavior							
	4. To learn coping strategies for health issues and realize the role of positive emotions in health psychology							
	5. To describe the various preventive measures for illness and various strategies of enhancing health							

Course Outcome	**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
CO1	Understanding of the role of psychological factors contributing to health issues.	**K2**
CO2	Realize different problematic health behaviors	**K3**
CO3	Organize various factors influencing the practice of health behavior	**K3**
CO4	Implement coping strategies and assimilate positive emotions to overcome health problems	**K3**
CO5	Describe the various preventive measures for illness and various strategies of enhancing health	**K3**

UNIT-I	**Introduction to Health Psychology**	**Periods: 09**
Definition - Meaning of Health Psychology – Health beliefs, Cognitive – behavioral approaches, health illness and mind-body continuum - Bio-Psychosocial model of health and its implications.		**CO1**
UNIT-II	**Models of Health Behavior**	**Periods: 09**
Health behavior – Types and Characteristics – Factors influencing health behavior and barriers to health behavior – Theories of Health Behavior - Avenues for health habit modification.		**CO2**
UNIT-III	**Enhancing Health Behavior**	**Periods: 09**
Importance of health enhancing behavior - Role of exercise, Yoga, Healthy diet, Weight management and Sleep - Psychology of Pain management, its theories and pain management techniques.		**CO3**
UNIT-IV	**Stress and Coping**	**Periods: 09**
Stress: definition, dimensions of stress- sources of chronic stress- Theoretical contributions: Lazarus's Appraisal Model, Flight or fight response, General adaptation Syndrome- Tending and Befriending Model- Coping strategies and the role of positive emotions in well being.		**CO4**
UNIT-V	**Health Care System**	**Periods: 09**

Indian Scenario, Attitude of Health Professionals, Burnout in health professionals, Designing health care work environment, Future challenges for health care, Growth of Health Psychology.	**CO5**

Lecture Periods: 45	**Tutorial Periods:**	**Practical Periods: -**	**Total Periods: 45**

Text Books

1. Allen, F. (2011). Health psychology and behavior. Tata McGraw Hill Edition.
2. Marks, D. F., Murray, M., Evans, B., &Estacio, E.V. (2006). Health Psychology. India: Sage Publications.
3. Sarafino, E. P. (1999). Health Psychology. John Wiley & Sons Inc.

Reference Books

1. Boyer, B., & Paharia, I. (2008). Comprehensive Handbook of Clinical Health Psychology. Edison, NJ: John Wiley &Sons.
2. Branmon, L., & Frist, J. (2010). Introduction to Health Psychology; New Delhi, India: Cengage Learning India Pvt Ltd.
3. Friedman, H.S. (2011) .Oxford Handbook of Health Psychology. Oxford:OU
4. Marks, D., Murray, M., Evans, B., Willig, C., Woodall, C., & Sykes, C.M. (2008). Health Psychology: Theory, research and practice (2nd Ed.). New Delhi, India: Sage Publications.

Web References

https://www.apa.org/education-career/guide/subfields/health#:~:text=Health%20psychology%20focuses%20on%20how,or%20change%20poor%20health%20habits.

* TE – Theory Exam, LE – Lab Exam

Department	**Food Science**			Programme: **B.Sc Nutrition and Dietetics**			
Semester	**Sixth**			Course Category Code: SEC		*End Semester Exam Type: **TE**	
Course Code	**A20NDS606**	Periods / Week			Credit	Maximum Marks	
		L	T	P	C	CAM	ESE	TM
Course Name	**BASICS IN RESEARCH METHODOLOGY**	**2**	**0**	**0**	**2**	**100**	**0**	**100**
Prerequisite	Nutrition and Research Methods							
Course Objectives	1. Basic knowledge on the role and importance of research in science.							
	2. Analyze research reviews identified in existing literature							
	3. Identify the research design and methods.							
	4. Know about the processing of data.							
	5. Develop a research proposal or industry project plan.							

Course Outcome	**On completion of the course, the students will be able to**	BT Mapping (Highest Level)
	CO1 Get an idea about the meaning of research and in science.	**K3**
	CO2 Acquaint the knowledge of review of literature	**K3**
	CO3 Understand the types of sample design and datacollection	**K3**
	CO4 Understand the importance of processing the data	**K3**
	CO5 Get acquainted knowledge about the layout of the research report	**K3**

UNIT-I	**Research Methodology – Introduction**	**Periods: 06**	
Research- Meaning, Definition, Characteristics, Objectives, Motivation Importance andtypes, Significance, Research and Scientific Method, Criteria of a good research.			**CO1**
UNIT-II	**Review of Literature**	**Periods: 06**	
Literature review - Definition, Purpose and Importance. Research Design - Definition, Concept- Variables and Attributes, Types - Exploratory,Diagnostic, Descriptive.			**CO2**
UNIT-III	**Sampling Methods**	**Periods: 06**	
Sample Design- Definition and Types - Systematic, Stratified, Cluster and Multistage. Data Collection - Definition and Types - Observation and Interview - Collection of datathrough questionnaire and schedule.			**CO3**
UNIT-IV	**Processing and Analysis of Data**	**Periods: 06**	
Processing of Data - Editing, Coding, Classification and Tabulation. Analysis of Data - Measures of central tendency-Mode, Median and Mean. Measures of dispersion- Range, Mean Deviation and Standard Deviation.			**CO4**
UNIT-V	**Research Report**	**Periods: 06**	
Layout of the Research Report - Preliminary Page, Main Text and End Matter. Hands on training on SPSS, Field report presentations.			**CO5**

Lecture Periods: 30	**Tutorial Periods: -**	**Practical Periods: -**	**Total Periods: 30**

Text Books

1. Kothari, C.R., (2004), Research Methodology, Methods and Techniques, SecondRevised Edition, New Age International Publishers, New Delhi.
2. Ranjit Kumar, (2011), Research Methodology: a step-by-step Guide for Beginners, ThirdEdition, SAGE

Publications, New Delhi.

3. Beverley Moriarty, (2018), Research Skills for Teachers – From Research QuestiontoResearch Design, Allen & Unwin Publishers, Australia.

Reference Books

1. Rajendra Kumar, C. (2008), Research Methodology, APH Publishing Corporation, NewDelhi.

2. Pagadala Suganda Devi (2017), Research Methodology: A Handbook for Beginners,Notion Press, Chennai.

3. Vijayalakshmi Ponnuraj and Sivaprakasam, C. (2008), Research Methods: Tips andTechniques, MJP Publishers.

Web References

https://www.indeed.com/career-advice/career-development/research-methodologyhttps://www.educba.com/types-of-research-methodology/
https://ccsuniversity.ac.in/bridge-library/pdf/MPhil%20Stats%20Research%20Methodology-Part1.pdf

* TE – Theory Exam, LE – Lab Exam

Department	**Food Science**	Programme: **B.Sc Nutrition and Dietetics**						
Semester	**Sixth**	Course Category Code: DSC			*End Semester Exam Type: L**E**			
Course Code	**A20NDL623**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**DIETETICS – II PRACTICAL**	**0**	**0**	**4**	**2**	**50**	**50**	**100**

Prerequisite	Diet Planning, Therapeutic Diet		
Course Objectives	To enable the students to 1. Provide comprehensive knowledge on principles and planning of therapeutic diets. 2. Acquire knowledge on dietary management for metabolic disorders.		
Course Outcome	**On completion of the course, the students will be able to**		BT Mapping (Highest Level)
	CO1	Understand the basic principles involved in planning diets for different disease conditions.	**K3**
	CO2	Plan and prepare diets to meet out the quality and quantity requirements for specific disease conditions	**K3**
	CO3	Acquire practical knowledge of therapeutic diet to meet the requirement	**K3**

Experiments — **Practicals - 30 hrs**

Planning and Preparation of diet in:

1. Obesity and Underweight
2. Diabetes Mellitus
3. Cardiovascular Disease - Hypertension, CHD
4. Renal Disorders - Glomerulonephritis, Nephrotic Syndrome
5. Acute Renal Failure and Chronic Renal Failure.

Text Books

1. Srilakshmi, B., Nutrition Science, New Age International (P) Ltd., New Delhi, 2017.
2. Mahtab, S, Bamji, Kamala Krishnasamy, G.N.V. Brahmam, Text Book of Human Nutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi, 2015
3. Swaminathan, M., Advanced Textbook on Food and Nutrition, Vol. 1, Second Edition, Bangalore Printing and Publishing Co. Ltd., Bangalore, 2015.

Department	**Food Science**	Programme: **B.Sc Nutrition and Dietetics**						
Semester	**Sixth**	Course Category Code: DSC			*End Semester Exam Type: L**E**			
Course Code	**A20NDP601**	Periods / Week			Credit	Maximum Marks		
		L	T	P	C	CAM	ESE	TM
Course Name	**PROJECT**	**0**	**0**	**10**	**5**	**40**	**60**	**100**

Prerequisite	Diet Planning, Therapeutic Diet
Course Objectives	To enable the students To gather the information regarding the novel recipes and diet therapies from various literature review. To develop innovative ideas in new food products To encourage the students to promote diet counseling techniques to prevent various diseases. To train the students for the preparation of project reports. To train the students to defend reviews and viva voce examination.
Course outcomes	CO1 - Identify the problem statement for the proposed work through the literature survey. CO2 – Understand the process of developing new food products. CO3 - Apply the acquainted skills to counsel the various diseases. CO4 - Estimate, plan and execute the project. CO5 - Defend the finding and conclude with oral/written reports.

Course Description:

- A Project topic must be selected either from published lists or the students themselves may propose suitable topics in consultation with their guides.
- The aim of the project work is to prepare novel recipes by incorporating the phytonutrients/ functional foods, evaluating the dietary practices for various diseases.
- The progress of the project is evaluated based on a minimum of three reviews.
- The review committee may be constituted by the Head of the Department.
- The End Semester Examination for the project work shall consist of an evaluation of the final project report by an external examiner, followed by a viva-voce examination.

Evaluation Method

Assessment	**Continuous Assessment Marks (CAM)**			**End Semester Examination (ESE) Marks**	**Total Marks**
	Review 1	**Review 2**	**Review 3**		
Marks	40 (review 1 – 10, review – 10, review 3 - 20)			60 (outcome – 10, presentation – 20, viva – 20, report – 10)	100

***** Application oriented / Problem solving / Design / Analytical in content beyond the syllabus