B.Sc., Bio Chemistry

Employability **Entrepreneurship** **Skill Development**

Name of The Programme	Course Code	Title Of The Course	Employability	Entrepreneurship	Skill development
B.Sc., Bio Chemistry	BUC	CC – III Analytical Techniques	✓		
	BUE3	MBE – I Medical Lab Techniques	✓		
	BUE4	MBE – II Biotechnology	✓		
	BUE2	NME – II Cosmetology		✓	
	BUS1	SBE – I Herbal Medicine		✓	
	BUD	CC- IV Human Physiology			✓
	BUE1	NME – I Women and Health			✓

EMPLOYABILITY PAPER SYLLABUS

Semester-II / Core Course-III	ANALYTICAL TECHNIQUES	Course Code: BUC
Instruction Hours: 6	Credits: 6	Exam Hours: 3
Internal Marks -25	External Marks-75	Total Marks: 100

Cognitive Level	K1-Acquire / Remember K2-Understanding K3-Apply K4-Analyze K5-Evaluate K6-Create	
Course Objectives	• To enable the Students to have a deep knowledge on the principles and applications of chromatography. • To understand the Students to get on Instrumentation and applications of electrophoresis. • To enable the students understand the Homogenization and cellular fractionation. • To learn about the UV – Vis spectrophotometer. • To understand the measurement of radioactivity GM counter, Scintillation counter and autoradiography	
UNIT	**CONTENT**	**HOURS**
UNIT I	**Chromatography:** Definition, Principles, Instrumentation & applications of paper chromatography, Thin layer chromatography, Column chromatography, Gas liquid chromatography, Ion exchange chromatography, High performance liquid chromatography, molecular sieve chromatography and affinity chromatography	**18 Hrs**

UNIT II	**Electrophoresis:** Definition, Principles, Instrumentation & Applications of paper electrophoresis, agarose gel electrophoresis, PAGE, SDS – PAGE, Immuno electrophoresis, Isoelectro focusing. Factors affecting electrophoretic techniques.	**18 Hrs**
UNIT III	**Centrifugation:** Homogenization and cellular fractionation. Centrifugation: Definition Principles RCF, sedimentation velocity and gravitational force and its units. instrumentation and application of analytical – preparatory and ultra Centrifugation. Molecular weight determination of proteins.	**18 Hrs**
UNIT IV	**Spectroscopy:** Colorimetry: Beer Lambert's Law, Light absorption and its transmittance, Absorption Spectroscopy - Principle, instrumentation and applications of colorimetry and UV-Vis spectrophotometer. Emission Spectroscopy–Spectrofluorimeter - Principle, instrumentation and applications. Flame photometry - principle and applications.	**18 Hrs**
UNIT V	**Radio isotopes:** Definition Radioactive decay: Measurement of radio activity – GM counter, Scintillation counter and autoradiography. Trace and techniques, biological applications of isotopes.	**18 Hrs**

Text Book:

1. Handbook of Analytical Techniques edited by Helmut Gunzler and Alex Williams2001.
2. Chatwal / Anand ,"Instrumental method of chemical analysis",2005

Reference Books:

1. Keith Wilson & John Walker, "Principles and techniques of practical biochemistry", Cambridge University Press, India2005.
2. Shourie and Shilpa S Chapadagaonkar, "Bioanalytical techniques", Abhilasha the

energyand resources institute, TERI, India 2015.

3. Ghosal Sabari and Srivastava, “Fundamentals of bio analytical techniques and instrumentation”, A.K. PHI Learning Pvt.Ltd.
4. Paviaetal,“Introduction to Spectrosocopy” Brooks/ColePublishersCo.,NewDelhi,India3rd edition.,2000.
5. K.K. Machve, “Basic Instrumentation”, Neha Publishers & Distributors, India2010.

Web-Resources:

1. http://web.uniplovdiv.bg/plamenpenchev/mag/books/anchem/Handbook%20of%20Analytical%20Techniques,%202%20Volume%20Set.pdf
2. https://www.worldcat.org/title/research-methodology-methods-techniques/oclc/395725716

Course Outcomes

On completion of the course the learner will be able

CO 1: Students acquired the various analytical techniques.

CO 2: On completion of this paper, the learner will be able to perform beers law calculations and calorimetry.

CO 3: Describe the principles of thin layer chromatography (TLC) and high performance liquid chromatography (HPLC) Draw a schematic diagram of the instrumentation.

CO 4: Employ the knowledge for the separation of proteins/ polypeptides by selecting appropriate separation techniques, characterize certain functionalities of biomolecules by using spectroscopic techniques.

CO 5: Significantly enhanced Knowledge of methodologist in various laboratory techniques.

Mapping of Course outcomes with Programme outcomes/ Programmes Specific outcomes

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	M	S	S	S	S	S
CO5	S	S	S	S	M	S	S	M	M	M

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester-I / Major based elective-I	MEDICAL LAB TECHNIQUES	Course Code: BUE3
Instruction Hours: 5	Credits: 5	Exam Hours: 3
Internal Marks:25	External Marks:75	Total Marks: 100

Cognitive Level	K1-Acquire / Remember K2-Understanding K3-Apply K4-Analyze K5-Evaluate K6-Create	
Course Objectives	• To enable the students understanding the various diagnostics method for identifying the disease. • The role of medical laboratory technology in the healthcare industry. • Communication in the Laboratory setting. • Accuracy, attention to detail, organization and quality control. • Safe and accurate performance of laboratory procedures.	
UNIT	**CONTENT**	**HOURS**
UNIT I	Introduction to medical laboratory science, safety in the laboratory, General Laboratory instruments and equipments.	**15 Hrs**
UNIT II	Collection of specimen and preservation, composition of weight, Measuring liquids and solids. Culture media and inoculation. Biochemical reaction, Antibiotic sensitivity test.	**15 Hrs**
UNIT III	Development of blood cells. Methods of estimation of hemoglobin. Blood sugar level. Blood urea level. Bleeding time, clotting time.	**15 Hrs**

UNIT IV	Cholesterol test, HDL cholesterol, Bilirubin test, Pregnancy test, Albumin and globulin ratio-Total cholesterol, lipoproteins-HDL,LDL,VLDL.	**15 Hrs**
UNIT V	VDRL test, Widal test, clinically diagnostics Enzymes-liver-AST, ALT, GT. Heart-AST, LDH, CK, Bone- Alkaline Phosphatase, Muscle-CPK.CRP test, HIV test, A.S.O test.	**(15 Hrs)**

Text Books:

1. Text Book of Medical Laboratory Techniques, Muhargee Vol I, II & III.

Reference Books:

1. A Text Book of Microbiology ,C.K.J. Panikar andAnanthanarayanan.
2. Text Book of Medical Laboratory Techniques ,MuhargeeVol I, II,III.
3. Text book of Biochemistry, S.Nagini.

Web-Resources:

1. https://www.ebooks.com/en-us/book/1602488/manual-of-medical- laboratory-techniques/s-ramakrishnan/.
2. https://www.pdfdrive.com/bensons-microbiological-applications- laboratory-manual-in-general-microbiology-short-version- e185416575.html

Course Outcomes

On completion of the course the learner will be able

- Recognize the role of medical laboratory technology in the context of providing quality patient healthcare.
- Perform basic clinical laboratory procedures using appropriate laboratory techniques and instrumentation in accordance with current laboratory safety protocol.

- Calculate and properly report laboratory data.
- Interpret laboratory results in accordance to laboratory protocol.
- Use effective written and verbal communication that represents competence and professionalism in the clinical laboratory setting.

Mapping of Course outcomes with Programme outcomes/ Programmes Specific outcomes

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	S	S	M	S	S	S	S	M
CO2	S	S	S	S	M	S	S	S	S	M
CO3	S	S	S	S	M	S	S	S	S	M
CO4	S	S	S	S	M	S	S	S	S	M
CO5	S	S	M	S	M	S	S	M	S	M

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester-VI / Major Based Elective-II	BIOTECHNOLOGY	Course Code: BUE4
Instruction Hours: 5	Credits: 5	Exam Hours: 3
Internal Marks -25	External Marks-75	Total Marks: 100

Cognitive Level	K1-Acquire / Remember K2-Understanding K3-Apply K4-Analyze K5-Evaluate K6-Create
Course Objectives	• To understand the technological aspect applied to molecular and microbial biology. • To understand principles of animal culture, media preparation. • To explain Invitro fertilization and embryo transfer technology. • To describe meristem culture and colonel propagation of plants on a commercial scale. To get insight in applications or recombinant DNA technology in agriculture, production of therapeutic proteins.

UNIT	CONTENT	HOURS
UNIT I	Fermentation biotechnology-biotechnology-scope and importance, basic principles of microbial growth, Bioreactor- batch and continuous bioreactor, fermentation culture medium, downstream processing, fermentation production of penicillin and vitamin B_{12}.	**15 Hrs**
UNIT II	Food and industrial biotechnology- Fermentation production of yoghurt and cheese. Production of single cell protein; spirulina; cultivation and uses. Biofertilizers- blue green algae; cultivation and uses. Production of amylase	**15 Hrs**

	and protease	
UNIT III	Molecular biotechnology- basic principles of cloning, introduction of foreign DNAin tohostbyparticlebombardmentgun,electrophorationandmicroinjection.Basic polymerasechain reaction(PCR), applications. Microarrays, the human genome project.	**15 Hrs**
UNIT IV	Animal and plant biotechnology- elementary details of animal cell and tissue culture, medium, transfection, targeted gene transfer, transgenic animals, plant cell and tissue culture, medium, totipotent, pluripotent cells, protoplat culture, artificial seeds and transgenic plants.	**15 Hrs**
UNIT V	Environment biotechnology - biological fuel generation - ethanol and methane from biomas. Sewage treatment. Bioremediation: oil spill cleanup, bioleaching, IPR, Bio safety and hazards of environmental engineering	**15 Hrs**

Text Book:

1. Text book biotechnology by R.K.Santhyanarayana, 2010 , Books & Applied (p) ltd.

Reference Books:

1. Molecular Biotechnology: Principles and Applications of Recombinant DNA- B.R.Glick & J.J.Pasterak, ASM Press, Washington, D.C., 2010.
2. Gene cloning and DNA analysis: an introduction / T.A. Brown.—6th ed. Brown, T.A. (Terence A.) Wiley-Blackwell. 2010.
3. Elements of Biotechnology- P.K.Gupta, Rastogi Publications, 2nd edition 3rd reprint, 2015-2016.
4. A text book of Biotechnology- R.C.Dubey, S.Chand Publications, 2014
5. Industrial Microbology- A.H.Patel,Macmillan , India Ltd, 2012
6. Animal Cell Culture and Technology, Michael Butler Garland Science/BIOS Scientific Publishers, Second Edition, London and New York. 2004.

Web-Resources:

1. https://www.pdfdrive.com/molecular-biotechnology-principles-and-applications-of-recombinant-dna-d33452385.html
2. https://www.pdfdrive.com/plant-biology-and-biotechnology-volume-ii-plant-genomics-and-biotechnology-e176062706.html.

Course Outcomes

On completion of the course the learner will be able

CO 1: Biotechnology in an historical perspective

CO 2: Scope and Importance of Biotechnology.

CO 3: Familiarization of the terms associated with plant tissue culture.

CO 4: Felt applications in the different domains of biotechnology.

CO 5: The concept of recombinant DNA technology.

Mapping of Course outcomes with Programme outcomes/ Programmes Specific outcomes

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	M	S	S	S	S	M
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	M

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

ENTREPRENEURSHIP PAPER SYLLABUS

Semester-IV / Non Major Elective-II	COSMETOLOGY	Course Code: BUE2
Instruction Hours: 2	Credits: 2	Exam Hours: 3
Internal Marks -25	External Marks-75	Total Marks: 100

Cognitive Level	K1-Acquire / Remember K2-Understanding K3-Apply K4-Analyze K5-Evaluate K6-Create	
Course Objectives	• To learn the scope of beauty culture and health care. • To understand the able to perform skills. • To introduce the hair analysis. • To acquire knowledge about cosmetic allergy. • To learn about the health care.	
UNIT	**CONTENT**	**HOURS**
UNIT I	Scope of beauty culture and health care. Career opportunity in beauty culture, Hotels and cosmetics industry.	**6 Hrs**
UNIT II	Manicure, pedicure and basic facials, electrology. Professional ethics and Communication skills. Home care recipes for skin and hair.	**6 Hrs**
UNIT III	Factors influencing hair loss, hair analysis and treatments, haircuts, coloring and dyeing, hair rebonding, transplantation, body and facial hair removals.	**6 Hrs**

UNIT IV	Definition of Cosmetology, Cosmetics allergy, skin analysis and care of various types of skin, body and nail art.	**6 Hrs**
UNIT V	Definition of physical and mental health. Social health and beauty with respect to care. Balanced diet for better beauty and health care. Sources and role of natural Antioxidant.	**6 Hrs**

Text Book:

1. Martin.M.Rieger "Harry's cosmeticology",2009
2. Sonia Tekchandani "Study of Clinical Cosmetology– 2", 2017

Reference Books:

1. Mythil's beauty care.
2. Harry'scosmotelogy
3. Anatomy, physiology and health education by Dr.Murugesh (Sathya publisher)
4. Meesa's beauty care series
5. Beauty Culture-H.EllenBrowing (Kessinger Publications)
6. Beauty Culture-A Practical Handbook on the Care of the Person- William.A.Woodbury.

Web-Resources:

1. https://www.pdfdrive.com/cosmetology-books.html.
2. https://www.pdfdrive.com/cosmetology-e57742835.html

Course Outcomes

On completion of the course the learner will be able

CO 1: To ensure the students basic concepts of beauty culture and health care.

CO 2: To understand the skill in the areas of skin, make up, manicuring.

CO 3: To study about the hair analysis such as hair cutting, coloring, styling.

CO 4: To understand the cosmetic allergy for skin ,hair and nail

CO 5: To ensure the student understand the physical, mental and health care.

Mapping of Course outcomes with Programme outcomes/ Programmes Specific outcomes

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	M	S	M	S	S	S	S	M
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	M	S	M	S	S	M	S	M

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester-IV / Skill Based Elective -I	HERBAL MEDICINE	Course Code: BUS1
Instruction Hours: 2	Credits: 2	Exam Hours: 3
Internal Marks -25	External Marks-75	Total Marks: 100

Cognitive Level	K1-Acquire / Remember K2-Understanding K3-Apply K4-Analyze K5-Evaluate K6-Create	
Course Objectives	• To learn the history of herbal medicine. • To understand the source of herbal materials. • To learn the drug yielding. • To understand the physical and chemical constants. • To learn the plant morphololology.	
UNIT	**CONTENT**	**HOURS**
UNIT I	Definition, Brief history, scope and application of herbal medicine. Study of various systems of drugs of plant origin in Allopathy, Ayurveda, Unani, Siddha, Homeopathy and Aromapathy.	**6 Hrs**
UNIT II	Source of herbal raw materials, identification, collection and processing of herbal drugs and authentication.	**6 Hrs**
UNIT III	Study of selected drug yielding microbial and groups (With reference to drug only). Actinomycetes, Fungi- Actinomycetes, gymnosperms, algae, Lichens and Bryophytes.	**6 Hrs**

UNIT IV	Determination of physical and chemical constants such as extractive values, moisture content, volatile oil content, ash values and bitterness value.	**6 Hrs**
UNIT V	Plant morphology –Botanical description of various plants parts used as drugs such as root, Rhizome, stolon, bulb, bark, leaf, flower, fruits, and seed.biological importance of phytochemicals.	**6 Hrs**

Text Book:

1. V. Kumaresan, "Herbal Biotechnology and Pharmacognosy" Saras publications.
2. Joseph E. Pizzorno and Michael T. Murray "Textbook of Natural Medicine" Fifth Edition 2020

Reference Books:

1. India medical plants by orient Longman-1996
2. Ayuruvedic materials media for domestic use by Thohomas J.Graham-2006
3. Herbal medicines by Dr.M.D .Zulfeequar Alam-2008
4. Medicinal Plants ,A.K.shrivastava,2010.
5. Pharmacognosy,C.KKokate, A.P.Purohit and S.B.Gokhale-2007

Web-Resources:

1. https://www.kobo.com/us/en/ebook/fundamentals-of-herbal-medicine-3.
2. https://www.barnesandnoble.com/b/free-ebooks/nook-books/alternative-medicine- natural-healing/herbal-medicine/_/N-ry0Z8qaZ11iu.

Course Outcomes

On completion of the course the learner will be able

CO 1: To ensure the students scope and application of herbal medicine.

CO 2: To understand the raw materials of herbal medicine.

CO 3: To study about the drug yielding in fungi and algae.

CO 4: To understand the determination of physical and chemical constants.

CO 5: To study about the botanical description of various plants

Mapping of Course outcomes with Programme outcomes/ Programmes Specific outcomes

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	M	S	S	S	S	M

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

SKILL DEVELOPMENT PAPER SYLLABUS

Semester-III / Core Course-IV	HUMAN PHYSIOLOGY	Course Code: BUD
Instruction Hours: 6	Credits: 6	Exam Hours: 3
Internal Marks -25	External Marks-75	Total Marks: 100

Cognitive Level	K1-Acquire / Remember K2-Understanding K3-Apply K4-Analyze K5-Evaluate K6-Create	
Course Objectives	• To enable the students can get knowledge about various physiological system and their function in human anatomy. • To learn the function of body fluid. • To study the concepts of digestive system. • To learn the structure if circulatory system. • To acquire knowledge about excretory, Nervous system and reproductive system.	
UNIT	**CONTENT**	**HOURS**
UNIT I	**BODY FLUIDS:** Extra cellular fluid - plasma - Interstitial and transcellular fluid. Intracellular fluid: Lymph and Blood - composition, functions, osmolarity of the body fluids, ionic composition, electrolytes, body buffers. Blood cells, hemoglobin, haemopoiesis, blood coagulation & blood groups.	**18 Hrs**

UNIT II	**DIGESTIVE SYSTEM:** Introduction to physiology. Anatomy of digestive system salivary, Gastric and bile secretions - composition and functions. Intestinal hormones, movements in Gastro intestinal tract, Secretion, digestion and absorption in the small intestine. Large intestine; Digestion and absorption of carbohydrates, lipids and proteins.	**18 Hrs**
UNIT III	**CIRCULATION:** Structure of Heart and blood vessels, cardiac cycles, blood pressure, factors affecting Blood pressure electrocardiogram. Respiration: Anatomy and physiology of respiration exchange of gases between lungs and blood, blood and tissues. Role of lungs in acid - base balance.	**18 Hrs**
UNIT IV	**EXCRETORY AND NERVOUS SYSTEM:** Structure of Kidney, Nephron composition and formation of urine, Renal regulation of acid - base balance. **Muscles :** types of muscles structure, mechanism of muscle contraction. **Nervous system :** structure of brain, neuron, nerve impulse, synapse, cerebrospinal fluid and blood brain barrier.	**18 Hrs**
UNIT V	**REPRODUCTIVE SYSTEM:** General anatomy of the male and female reproductive organs. Testis, ovary, uterus, menstrual cycle, physiological changes. Spermato genesis, ovulation, physiology of pregnancy- metabolic changes during pregnancy.	**18 Hrs**

Text Book:

1. Human Physiology, Arumugam,2007.
2. Textbook Of Medical Physiology-3rd Updated Edition Paperback – 29 August 2019

Reference Books:

1. Human physiology ,Vol. I & II - C.V. Chatterjee ,2000
2. Function of Human body , Guyton A.C., 1996
3. The living body ,Best C.H. Taylor N.B.,2000
4. Human Physiology ,Systemic & applied ,Sahalya,2007
5. Book of Basic Human Physiology,Dr.H.Singh,2008
6. Animal Physiology, Mohan .P.Arora,2008

Web-Resources:

1. https://library.palmer.edu/physioweb.
2. https://openstax.org/details/books/anatomy-and-physiology.

Course Outcomes

On completion of the course the learner will be able

CO 1: Ensure the students to acquire knowledge on composition and function of body fluid.

CO 2: To understand apply the various concepts of digestive system.

CO 3: To understand the anatomy and physiology and cardiovascular and respiratory system.

CO 4: To classify different type of muscle and anatomy of excretory and nervous system.

CO 5: To understand the general anatomy and function of the male and female reproductive organs.

Mapping of Course outcomes with Programme outcomes/ Programmes Specific outcomes

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	S	S	M	S	S	S	S	M
CO2	S	S	S	S	M	S	S	S	S	M
CO3	S	S	M	S	M	S	S	S	S	M
CO4	S	S	M	S	M	S	S	S	S	M
CO5	S	S	S	S	M	S	S	M	M	M

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester-III / Non Major Elective-I	WOMEN AND HEALTH	Course Code: BUE1
Instruction Hours: 2	Credits: 2	Exam Hours: 3
Internal Marks -25	External Marks:75	Total Marks: 100

Cognitive Level	K1-Acquire / Remember K2-Understanding K3-Apply K4-Analyze K5-Evaluate K6-Create	
Course Objectives	• To learn the female reproductive system and diseases. • To understand the vaccines for during pregnancy. • To study of different types of parturition. • To learn the health problem in women. • To enable the students can get knowledge about balanced diet for women.	
UNIT	**CONTENT**	**HOURS**
UNIT I	Study of the female reproductive system, female hormones, menarche, menstrual cycle ,menopause, associated problems - premenstrual syndrome, amenorrhoea, dysmenorrhoea, polycystic ovarian diseases (PCOD) and fallopian tube obstruction, nutrition during adolescence.	**6 Hrs**
UNIT II	Pregnancy, vaccines and diagnosis test during pregnancy, fetal testing – amniocentesis and other tests for genetic abnormalities, genetic counselling complications associated with pregnancy – gestational diabetes, ectopic pregnancy ,miscarriage ,nutrition during pregnancy.	**6 Hrs**
UNIT III	Parturition –different types, significance of breast feeding, nutrition	**6 Hrs**

	during lactation, vaccination for infants, contraceptive methods, sexually transmitted diseases.	
UNIT IV	Health problems in women, cancer –breast cancer, cervical cancer ovarian cancer, diagnosis and treatment. Menopause associated problems- osteoporosis. Hormones replacement therapy.	**6 Hrs**
UNIT V	Balanced diet for women –carbohydrate, lipids, proteins vitamins and minerals - sources and deficiency disorders . Physicals activity – calorie expenditure for various activities, aerobics and yoga**.**	**6 Hrs**

Text Book:

1. Text Book of Womens, Health Lila A.Wallis, 1997
2. Nutrition Science, B.Sri Lakshmi,2008

Reference Books:

1. Essential of food and nutrition,Vol.I and II,Swaminathan.M,2006
2. Food chemistry,L.G.Meyor
3. Food Science,Polter
4. Nutrition Science,B.Sri Lakshmi,2008
5. A text book of Health Worker (ANM),Vol I and II ,A.M .Chacklay.

Web-Resources:

1. https://www.elsevier.com/books/women-and-health/goldman/978-0-12-288145-9.
2. https://www.ebooks.com/en-us/subjects/health-fitness-women-s-health-ebooks/401/.

Course Outcomes

On completion of the course the learner will be able

CO 1: Ensure the students to acquire knowledge on anatomy of female reproductive system and related diseases.

CO 2: To understand the concepts of vaccines and genetic complication during the pregnancy.

CO 3: To understand acquire knowledge on different types of parturition and vaccination for infants.

CO 4:Ensure the students to understand acquire knowledge on diagnosis and treatment in health problem for women

CO 5:Ensure the students to understand acquire knowledge on balanced diet and physical activity for women

Mapping of Course outcomes with Programme outcomes/ Programmes Specific outcomes

CO/PO	PO						PSO					
	1	2	3	4	5	6	1	2	3	4	5	6
CO1	S	S	S	S	M	M	S	S	S	S	S	M
CO2	S	S	S	M	S	M	S	S	S	S	S	M
CO3	S	S	S	S	M	M	S	S	S	S	S	M
CO4	S	S	M	M	S	M	S	S	S	S	M	M
CO5	S	S	S	S	S	M	S	S	M	S	S	M

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation

Semester-V / Skill Based Elective -II	FOOD AND NUTRITION	Course Code: BUS3
Instruction Hours: 2	Credits: 2	Exam Hours: 3
Internal Marks :25	External Marks:75	Total Marks: 100

Cognitive Level	K1-Acquire / Remember K2-Understanding K3-Apply K4-Analyze K5-Evaluate K6-Create	
Course Objectives	• To enable the students can get knowledge about dietary intake for diseases like, returns diabetes, arthrosclerosis, Ulcerative etc. • To provide students with the knowledge of basic terminology and several aspects of nutrition and the functions of food in healthy life sustenance; • To ensure that students are familiar with the food classification, nutrition during special conditions and role of special functional food; • To equip students with knowledge and understanding of modern aspects of nutritional science and novel food usage	
UNIT	**CONTENT**	**HOURS**
UNIT I	Source food composition, properties and storage of common foods, functions of food in relation to health – classification of food based on nutrients, food preservation–food addictives. Types of food - body building foods and protective foods – Bomb colorimeter.	**6 Hrs**

UNIT II	Essential nutrients: fats, carbohydrates and proteins, Energy needs. Definition of unit of energy – Kcal, RQ, SDA, NPU, Basal metabolism – BMR – factors influencing BMR. Role of fiber in diet.	**6 Hrs**
UNIT III	Micro and macro mineral nutrients: Distribution, sources, metabolic functions and deficiency manifestion vitamins – classification, source functions and Deficiency disorder – hyper and hypo vitaminosis. Water and electrolyte balance.	**6 Hrs**
UNIT IV	Nutrition in different stages – Infants, children, adolescents, pregnant, lactating women and old persons.	**6 Hrs**
UNIT V	Principles of diet therapy. Diet during stressed conditions, labourer and patients, therapeutic diets for anemia, malnutrition, obesity, diabetes mellitus and allergy	**6 Hrs**

Text Book:

1. Food Chemistry, L.GMeyers, CBS, 2004, Puiblishers & Distributors.
2. Food science, Polter 2001, CBSpublishers & Distributers

`Reference Books:

1. Food Chemistry, L.GMeyers, CBS, 2004, Puiblishers & Distributors.
2. Food science, Polter 2001, CB Spublishers & Distributers
3. Essential of food nutritions, Vol I&II ,Swaminathan. M.S, Bangalorepriting
4. A Test book of food and nutrition, Annie Fredrick 2006 lotus press.

Web-Resources:

1. http://www.fao.org/publications/e-book-collection/nutrition/en/.
2. https://www.pdfdrive.com/nutrition-and-dietetics-text-books-online-e6071568.html
3. https://rushu.libguides.com/nutrition/ebooks.

Course Outcomes

On completion of the course the learner will be able

CO 1: Locate and interpret government regulations regarding the manufacture and sale of food products.

CO 2: Discuss the major chemical reactions that occur during food preparation and storage.

CO 3: Discuss the important pathogens and spoilage microorganisms in foods.

CO 4: Explain the effects of common food preparation methods and food storage conditions on survival and growth of microbial contaminants. Obtain food protection manager certification

CO 5: Discuss basic principles of common food preservation methods.

Mapping of Course outcomes with Programme outcomes/ Programmes Specific outcomes

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	M	S	S	S	S	M	S	S

S - Strongly Correlated

M - Moderately Correlated

W-Weakly Correlated

N – No Correlation