

**Shri Rawatpura Sarkar University,
Raipur**



**Examination Scheme & Syllabus as per
Outcome Based Education (OBE) and
Choice Based Credit System (CBCS)**

for

BACHELOR OF SCIENCE

In

NUTRITION & DIETETICS

Semester I

(Effective from the session: 2022-23)

Program Outcome	<p>PO 1: Development of intra-disciplinary skills - This opens wide range of opportunities for students in job sector. Studying wide range of subjects like Dietetics, Community Nutrition, Family Meal Management, Quantity Food Production & Service, Food Safety and Quality Control, Bakery Science, Geriatric Nutrition - both theory and practical, help students in developing skills related to various fields of nutrition.</p> <p>PO 2: Scientific and Critical Thinking - Development of knowledge, skills and holistic understanding of the discipline among students. Encouragement of scientific mode of thinking and scientific method of enquiry in students. This goal is achieved through the on job trainings conducted by the Department in Hospitals and Community and the writing of a report on it.</p> <p>PO 3: Health management and community upliftment - The course equips students with ability to manage a healthy society and country. This goes a long way in progress of entire nation and thus world. Students can work at both national and international level after completion of higher studies in this course.</p> <p>PO 4: Self dependency- The course gives an opportunity to willing students to establish an enterprise of their own in health & food sectors.</p> <p>PO 5: Promoting healthy environment- To inculcate social values promoting healthy environment and reaching out to the community.</p> <p>PO 6: Provide advanced knowledge- Provide advanced knowledge and skills in highly job oriented courses in the areas of Food Processing, Quality Control, Food Safety, and Nutritional Sciences.</p> <p>PO7: Identify food based strategies- Identify food based strategies for alleviating nutritional problems to achieve nutrition and health security.</p> <p>PO 8: Provide quality education- The course provide quality education to make the students technically competent to face the challenges in the field of Food Science, Nutrition and Dietetics.</p> <p>PO 9: Understanding specific diseased conditions- The programme provides in-depth understanding of the role of food under specific diseased conditions.</p> <p>PO 10: Inter-disciplinary programme: Basically this is an inter-disciplinary programme with knowledge of human anatomy, microbiology, biochemistry and their role in relation to food and health.</p>
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Shri Rawatpura Sarkar University, Raipur

Faculty of Science

Three Years B. Sc. Programme

Scheme of Teaching and Examination

B. Sc. First Semester Nutrition & Dietetics

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2022-2023)

SN	Course Code	Course Title	Type of Course	Hours/Week			Credits	Maximum Marks			Sem End Exam Duration (Hrs.)
				L	T	P		Continuous Evaluation	Sem. End Exam	Total	
1.	SBS06101T	Human Anatomy	Core	4	-	-	4	30	70	100	3
2.	SBS06102T	Human Physiology	Core	4	-	-	4	30	70	100	3
3.	SBS06103T	Basic Nutrition	Core	4	-	-	4	30	70	100	3
4.	SBS06111T	English Language	AECC	4	-	-	4	30	70	100	3
5.	SBS06191P	Lab course: I	Core Practical	-	-	4	2	15	35	50	5
6.	SBS06192P	Lab Course: II	Core Practical	-	-	4	2	15	35	50	5
7.	SBS06193P	Lab Course: III	Core Practical	-	-	4	2	15	35	50	5
TOTAL				16		12	22			550	

Course Title	HUMAN ANATOMY				
Course Code	SBS06101T				
Course Credits	L	T	P	TC	
	4	-	-	4	
Prerequisites	Fundamental knowledge of Biological sciences.				
Course Objectives	<ul style="list-style-type: none"> To provide students with a firm understanding of the general anatomy of the human body 				
Course Contents	<p>UNIT I</p> <p>Introduction: Human body as a whole</p> <p>Definition of anatomy and its divisions, Terms of location, positions and planes, Cell and its organelles, Epithelium-definition, classification, describe with examples, function, Glands-classification, describe serous & mucous glands with examples, Basic tissues – classification with examples.</p> <p>UNIT II</p> <p>Locomotion and Support</p> <p>Cartilage – types with example & histology, Bone – Classification, names of bone cells, parts of long bone, microscopy of compact bone, names of bones, vertebral column, inter vertebral disc, fontanelles of fetal skull, Joints – Classification of joints with examples, synovial joint (in detail for radiology), Muscular system- Classification of muscular tissue & histology, Names of muscles of the body.</p> <p>Sensory Organs: Skin: Skin-histology, Appendages of skin, Eye: Parts of eye & lacrimal apparatus, Extra-ocular muscles & nerve supply, Ear: parts of ear- external, middle and inner ear and contents</p> <p>UNIT III</p> <p>Cardiovascular System</p> <p>Heart-size, location, chambers, exterior & interior, Blood supply of heart, Systemic & pulmonary circulation, Branches of aorta, common carotid artery, subclavian artery, axillary artery, brachial, artery, superficial palmar arch, femoral artery, internal iliac artery, Peripheral pulse, Inferior venacava, portal vein, portosystemic anastomosis, Great saphenous vein, Dural venous sinuses, Lymphatic system- cisterna chyli & thoracic duct, Histology of lymphatic tissues, Names of regional lymphatics, axillary and inguinal lymph nodes in brief.</p> <p>Respiratory System Parts of RS, nose, nasal cavity, larynx, trachea, lungs, bronchopulmonary segments, Histology of trachea, lung and pleura, Names of paranasal air sinuses. Peritoneum: Description in brief,</p> <p>Urinary System: Kidney, ureter, urinary bladder, male and female urethra, Histology of kidney, ureter and urinary bladder.</p> <p>Embryology: Spermatogenesis & oogenesis, Ovulation, Fertilization, Fetal circulation, Placenta</p> <p>UNIT IV</p> <p>Gastro-intestinal System: Parts of GIT, Oral cavity (lip, tongue (with histology), tonsil,</p>				

	<p>dentition, pharynx, salivary glands, Waldeyer's ring), Oesophagus, stomach, small and large intestine, liver, gall bladder, pancreas, Radiographs of abdomen.</p> <p>Reproductive System: Parts of male reproductive system, testis, vas deferens, epididymis, prostate (gross & histology), Parts of female reproductive system, uterus, fallopian tubes, ovary (gross & histology), Mammary gland-gross.</p> <p>UNIT V</p> <p>Endocrine Glands:-Names of all endocrine glands in detail on pituitary gland, thyroid gland, parathyroid gland, suprarenal gland (gross & histology).</p> <p>Nervous System Neuron, Classification of NS, Cerebrum, cerebellum, midbrain, pons, medulla oblongata, spinal cord with spinal nerve (gross & histology), Meninges, Ventricles & cerebrospinal fluid, Names of basal nuclei, Blood supply of brain, Cranial nerves, Sympathetic trunk & names of parasympathetic ganglia.</p>
Course Outcomes	<p>Student will be able to</p> <ul style="list-style-type: none"> • Recognition and understanding of the essential terminology necessary to properly describe the fundamental relationships and orientation of structures in the human body. • Clear the basic concept of locomotion and sensory evaluation. • Understanding the anatomy of cardiovascular system. • Know about GI System and Reproductive System. • Understanding the basic function of Endocrine gland and Nervous system.
Text Books	<ol style="list-style-type: none"> 1. Ranganathan, T.S., A Text Book of Human Anatomy 2. Fattana, Human Anatomy, (Description and Applied), Saunder's & C P Prism Publishers, Bangalore 3. Ester. M. Grishcimer, Physiology & Anatomy with Practical Considerations, J.P. Lippin Cott. Philadelphia.
Reference Books	<ol style="list-style-type: none"> 1. William Davis, Understanding Human Anatomy and Physiology, McGraw Hill. 2. Chaurasia's, A Text Book of Anatomy

Course Title	HUMAN PHYSIOLOGY				
Course Code	SBS06102T				
Course Credits	L	T	P	TC	
	4	-	-	4	
Prerequisites	Fundamental knowledge of Biological sciences.				
Course Objectives	<ul style="list-style-type: none"> • To provide a course of study in mammalian, principally human, systems physiology, building on knowledge of basic physiological principles. 				

<p>Course Contents</p>	<p>UNIT I</p> <p>Cell: Definition, Structure and function of Cytoplasmic Organelles, Reproduction-Meiosis, Mitosis. The important physico-chemical laws applied to physiology: Diffusion, Osmosis, Bonding, Filtration, Dialysis, Surface Tension, Adsorption, Colloid.</p> <p>UNIT II</p> <p>Introduction- composition and function of blood: Red blood cells- Erythropoiesis, stages of differentiation function, counts physiological Variation. Haemoglobin -Structure, function, concentration physiological variation. Methods of Estimation of Hb, White blood cell-Production, function, life span, count, differential count.</p> <p>UNIT III</p> <p>Platelets- Origin, normal count, morphology functions. Plasma Proteins- Production, concentration, types, albumin, globulin, fibrinogen, Prothrombin functions. Haemostasis & Blood coagulation. Haemostasis – Definition, normal haemostasis, clotting factors, mechanism of clotting disorders of clotting factors</p> <p>UNIT IV</p> <p>Blood Bank, Blood groups-A, B, O system, Rh system, Blood grouping & typing, Cross-matching, Rh system-Rh factor, Rh in Cross-matching, Blood transfusion – Indication, universal donor and recipient concept. Selection criteria of a blood donor. Transfusion Anticoagulant – Classification, Examples and uses. Anaemia's: Classification: morphological and etiological. Effects of anaemia on body.</p> <p>UNIT V</p> <p>Blood indices – Colour index, MCH, MCV, MCHC, Erythrocyte Sedimentation Rate (ESR) and Packed cell volume, Normal Values, Definition, determination. Blood Volume – Normal value, determination of blood volume and regulation of blood volume body fluid- pH, normal value, regulation and variation.</p>
<p>Course Outcomes</p>	<p>At the end of the course students should:</p> <ul style="list-style-type: none"> • have an enhanced knowledge and appreciation of mammalian physiology; • understand the functions of important physiological systems including the cardio-respiratory, renal, reproductive and metabolic systems; • understand how these separate systems interact to yield integrated physiological responses to challenges such as exercise, fasting and ascent to high altitude, and how they can sometimes fail; • be able to perform, analyse and report on experiments and observations in physiology; • be able to recognise and identify principal tissue structures.
<p>Text Books</p>	<ol style="list-style-type: none"> 1. Guyton, Arthur, Text Book of Physiology, Prism Publishers 2. Chatterjee, C C, Human Physiology, Medical Allied Agency 3. A.K Jain, Human Physiology
<p>Reference Books</p>	<ol style="list-style-type: none"> 1. William Davis, Understanding Human Anatomy and Physiology, McGraw Hill

Course Title	BASIC NUTRITION				
Course Code	SBS06103T				
Course Credits	L	T	P	TC	
	4	-	-	4	
Prerequisites	Fundamental knowledge of nutrition science.				
Course Objectives	<ul style="list-style-type: none"> • Describe basic nutrition required • Understand food quality. 				
Course Contents	<p>UNIT I Introduction to nutrition- Food as source of nutrients, functions of food, definition of nutrition, nutrients & energy, adequate, optimum & good nutrition, malnutrition.</p> <p>UNIT II Nutrition - Fitness, Athletics & Sports. Food guide - Basic five food groups, How to use food guide (according to R.D.A.) Interrelationship between nutrition & health: - Visible symptoms of goods health.</p> <p>UNIT III Use of food in body - Digestion, Absorption, transport & utilization. Role of fibers in human nutrition. Carbohydrates: Functions, classification, food sources, storage in body. Fats & oils: composition, saturated and unsaturated fatty acids, classification, food sources, function of fats. Proteins - composition, sources, essential & non-essential amino acids, functions, Protein deficiency.</p> <p>UNIT IV Water - as a nutrient, function, sources, requirement, water balance & effect of deficiency. Minerals - macro & micronutrients- functions, sources. Bioavailability and deficiency of Calcium, Iron, Iodine, Sodium & Potassium (in very brief).</p> <p>UNIT V Vitamins (water & fat soluble)- definition, classification & functions. Effect of cooking & heat processing on the nutritive value of foods. Processed supplementary foods. Food sanitation in hygiene.</p>				
Course Outcomes	<p>Student will be able to:</p> <ul style="list-style-type: none"> • Clear the basic concept of nutrition. • Know about nutrition and fitness. • Identify sources and functions of carbohydrates, proteins, fats, alcohol, vitamins, minerals, and water in the human body. • Demonstrate the importance of a balanced diet and use tools that can be utilized to evaluate the nutritional adequacy of a diet (RDA, Dietary Guidelines, My Plate, etc.). • Identify the relationship between diet and chronic diseases/illnesses (cardiovascular disease, diabetes, obesity, cancer, hypertension, osteoporosis, etc.) and what modifications can be made in the diet to reduce the risk for these diseases/illnesses. 				

Text Books	<ol style="list-style-type: none"> 1. Mudambi Sumati R., Fundamentals of Food, Nutrition and Diet therapy, New Age International Pvt. Ltd. 2. TK Indrani, Manual of Nutrition & Therapeutic Diet, Jaypee Brothers Medical Publishers.
Reference Books	<ol style="list-style-type: none"> 1. F. P. Antia & Philip Abraham, Clinical Dietetics and Nutrition, Oxford University Press. 2. B. Srilakshmi, Nutrition Science, New Age Publisher.

Course Title	ENGLISH LANGUAGE				
Course Code	SBS06111T				
Course Credits	L	T	P	TC	
	2	-	-	2	
Prerequisite	Basic English knowledge of 10+2				
Course Objectives	<ul style="list-style-type: none"> • To refresh the previous knowledge of students in the area of grammar. Revise what they already know so that all students come on the same level; and to enhance their skills further. • To increase their expertise in the language, which in turn would help them in being better communicators, understand and express themselves better and clearer. • To enable students to apply basic principles of grammar both in oral and written communication. • To cultivate reading habit through off line study of English literature. 				
Course Contents	<p>UNIT – I</p> <p>Literature:-The Open Window (Lesson) - H.H. Munro, All the World’s a Stage (Poem) - W. Shakespeare Kabuliwala (lesson) - Rabindranath Tagore, The Portrait of Lady (Lesson) Khushwant Singh.</p> <p>UNIT – II</p> <p>Grammar:-Introductory Grammar, Articles, Determiners, Introduction to communication skills Prepositions; Active and passive voice and Modals; Listening skills: Introduction, Homophones. Tenses; Pronoun, Adjective, Adverb.</p> <p>UNIT – III</p> <p>Writing and Vocabulary:-Writing Skills- Basic Rules, Letter writing- Applications, Paragraph writing; Précis writing; Idioms and phrases; Antonyms, Synonyms, Vocabulary.</p> <p>UNIT – IV</p> <p>Business Communication:-Writing Skill: Official Correspondence, Circular, Agenda, Notice, Press Release, Report writing about the proceedings of any seminar, Preparation of official reports, Letter to Vendor quotation, Query for details of any item, Reminder letter,</p>				

	Newspaper Reports and Advertisement. UNIT – V Communication Skills and Personality Grooming:- Conversation Practice, Debates, Mock Interview, Group Discussions and Seminar Presentations.
Course Outcomes	Student will be able to: <ul style="list-style-type: none"> • This course student will be able to understand the language for presenting the real extract of the subject to the society. • Clear the general concept of English grammar. • Understanding the writing and vocabulary. • Learn about the business communication. • Improve the communication skill and personality grooming.
Text Books	1. Advanced English Grammar – Martin Hewings. 2. English Grammar & Composition by- Wren & Martin.
Reference Books	1. A Practical English Grammar by- A.J. Thompson & A. V. Martinet. 2. Intermediate grammar usage & Composition by- M. L. Tickoo, A. E. Subramaniam, & P. R. Subramaniam.

Course Title	Lab Course I				
Course Code	SBS06191P				
Course Credits	L	T	P	TC	
	-	-	2	2	
Prerequisites	Human Anatomy theory paper.				
Course Objectives	<ul style="list-style-type: none"> • Practical understanding of the structure of human body in detail. 				
	ANATOMY <ol style="list-style-type: none"> 1. Histology of types of epithelium, Histology of serous, mucous & mixed salivary gland. 2. Histology of the 3 types of cartilage, Demo of all bones showing parts, radiographs of normal bones & joints, Histology of compact bone (TS & LS), Demonstration of all muscles of the body, Histology of skeletal (TS & LS), smooth & cardiac muscle. 3. Demonstration of heart and vessels in the body, Histology of large artery, medium sized artery, vein, large vein, Microscopic appearance of large artery, medium sized artery & vein, large vein, pericardium, Histology of lymph node, spleen, tonsil & 				

Course Contents	<p>thymus, Normal chest radiograph showing heart shadows, Normal angiograms.</p> <ol style="list-style-type: none"> 4. Demonstration of parts of respiratory system, Normal radiographs of chest, Histology of lung and trachea. 5. Demonstration of reflections. 6. Demonstration of parts of urinary system, Histology of kidney, ureter, urinary bladder, Radiographs of abdomen-IVP, retrograde cystogram. 7. Demonstration of section of male and female pelvis with organs in situ, Histology of testis, vas deferens, epididymis, prostate, uterus, fallopian tubes, ovary, Radiographs of pelvis – hystero salpingogram. 8. Demonstration of the glands, Histology of pituitary, thyroid, parathyroid, suprarenal glands. 9. Histology of peripheral nerve & optic nerve, Demonstration of all plexuses and nerves in the body, Demonstration of all part of brain, Histology of cerebrum, cerebellum and spinal cord. 10. Histology of thin and thick skin, Demonstration and histology of eyeball, Histology of cornea & retina.
Course Outcomes	<p>Student will be able to</p> <ul style="list-style-type: none"> • The students shall be able to perform the identification and diagnosis effectively. • Learn about the cardiovascular system and respiratory system. • Understanding the reflections and urinary system. • The students shall be able to understand the male - female pelvis and human gland. • Learn about the histology of peripheral nerve, optic nerve, cornea and retina.
Text Books	<p>Textbooks</p> <ol style="list-style-type: none"> 1. William Davis, Understanding Human Anatomy and Physiology, Mc Graw Hill. 2. Chaurasia's, Practical of Human Anatomy. 3. Ranganathan, T.S., A Text Book of Human Anatomy
Reference Books	<p>Reference Books</p> <ol style="list-style-type: none"> 1. Fattana, Human Anatomy, (Description and Applied), Saunder's & C P Prism Publishers, Bangalore 2. Ester. M. Grishcimer, Physiology & Anatomy with Practical Considerations, J.P.Lippin Cott. Philadelphia

Course Title	Lab Course II				
Course Code	SBS06192P				
Course Credits	L	T	P	TC	
	-	-	2	2	

Prerequisites	Human Physiology theory paper.
Course Objectives	<ul style="list-style-type: none"> • Understand basic physiology of human. • Effectively perform the quantitative analysis of human physiology.
Course Contents	<p>PHYSIOLOGY</p> <ol style="list-style-type: none"> 1. Haemoglobinometry. 2. White Blood Cell Count. 3. Red Blood Count. 4. Determination of Blood Groups. 5. Leishman's staining and Differential WBC count. 6. Determination of packed cell Volume. 7. Erythrocyte sedimentation rate [ESR]. 8. Calculation of blood indices. 9. Determination of Clotting Time, Bleeding Time. 10. Blood pressure Recording. 11. Auscultation for Heart Sounds.
Course Outcomes	<p>Student will be able to</p> <ul style="list-style-type: none"> • Identify the significance of microscope. • Learn about the blood cell and blood count. • Clear the basic concept of cell volume, ESR and blood indices. • Know about the clotting time, bleeding time and heart sound. • Analysis of factors governing metabolic activities inside human body.
Text Books	1. K. R. Aneja, Experiments in Microbiology, Plant Pathology and Biotechnology, New Age Publications.
Reference Books	1. William Davis, Understanding Human Anatomy and Physiology, McGraw Hill

Course Title	Lab Course III				
Course Code	SBS06193P				
Course Credits	L	T	P	TC	
			2	2	
Prerequisites	Basic Nutrition theory paper.				

Course Objectives	<ol style="list-style-type: none"> 1. Understanding the basic properties of nutrients. 2. Effectively perform qualitative tests on Nutrients.
Course Contents	<ol style="list-style-type: none"> 1. Identification of carbohydrates (Qualitative Tests). 2. Identification of proteins (Qualitative Tests). 3. To study general properties of the enzyme Urease & Achromatic time of salivary amylase. 4. Estimation of glucose in urine by Benedict's methods. 5. Urine analysis - normal & abnormal constituents of urine. 6. Blood glucose estimation. 7. Determination of water soluble and water - insoluble ASH. 8. Planning and preparation of high calorie diet. 9. Planning and preparation of low calorie diet. 10. Microscopic structure of cereal starches.
Course Outcomes	<p>+Student will be able to</p> <ul style="list-style-type: none"> • Understanding the basic properties of carbohydrate and protein. • Know about the properties of enzyme and salivary amylase. • Students learn about the benedict methods. • Effectively perform the urine analysis. • Students can also know about the blood glucose estimation.
Text Books	<ol style="list-style-type: none"> 1. Manjula Shantaram, Biochemistry & Nutrition for B.Sc. Nursing, Jaypee Brothers Medical Publishers (P) Ltd. 2. Ruma Singh, Food and Nutrition for Nurses, Jaypee Brothers Medical publishers (P) Ltd.
Reference Books	<ol style="list-style-type: none"> 1. Food science B Srilakshmi, Nutritional Biochemistry, D.C. Sharma & Devanshi Sharma, CBS Nursing.