Syllabus for B.Voc.Programme

in

Bachelor of Vocation in Nutrition and

Health Care Science
Choice Based Credit System (CBCS)

CBCS SYLLABUS FOR B. VOC
NUTRITION AND HEALTH CARE SCIENCE (NHCS)

PROGRAMME TEMPLETE B. VOC. IN NHCS

GAUHATI UNIVERSITY

SEMESTER	CORECOURSE (12 PAPERS, 72 CREDITS)	ABILITY ENHANCEMENT CUMPOLSURY COURSE (AECC) [2 PAPERS, 8 CREDITS]	SKILL ENHANCEMENT COURSE (SEC) [4 PAPERS, 16 CREDITS]	DESCIPLINE SPECIFIC ELECTIVE (DSE) [6 PAPERS, 36 CREDITS]
I	NHS-VC-1016	ENG-AEC-1014		
	NHS-VC -1026			
	NHS-VC -1036			
II	NHS-VC -2016	Env. Studies-AEC-2014		
	NHS-VC -2026			
	NHS-VC -2036			
III	NHS-VC -3016		Computer Application XXX-SE-3XX4	
	NHS-VC -3026			
	NHS-VC -3036			
IV	NHS-VC -4016		Operation Theater Technology & Dialysis XXX-SE-4XX4	
	NHS-VC -4026			
	NHS-VC -4036			
V			CSSD Technology-I XXX-SE-5XX5	NHS-VE -5016
				NHS-VE -5026
				NHS-VE -5036
VI			CSSD Technology-II XXX-SE-6XX6	NHS-VE -6016
				NHS-VE -6026
				NHS-VE -6036

Job Description for B.Voc. Nutrition and Health Care Science students

Name of the Program(s) (Diploma, Adv. Diploma, Degree)	**Semesters**	**No. of Credits 30Credit /Semester**	**Job Roles and NSQF-Levels**
Diploma in Nutrition and Health Care Science	I II	60 credits	**NSQF-Level 5** Supervisor
Advance Diploma in Nutrition and Health Care Science	III IV	60 credits	**NSQF-Level 6** Technician / Trainer
B.Voc. in Nutrition and Health Care Science	V VI	60 credits	**NSQF-Level 7** B.Voc. Graduate

Semester-1: Core 1 NHS-VC-1016: Anatomy & Physiology

Unit I+II=1 Credit, Unit III + IV= 1 Credit, Unit V+VI=1 Credit & Unit VII+VIII=1 Credit
Total Marks:100; Total Credit: 04
Theory (Total marks: 60)

Unit-I: The Animal Organism

Study of the structure of a cell in general: cell membrane, Nuclear, membrane, Nucleus, Cytoplasm

Physiology of the cell: Introduction, objectives (definition of Physiology – tissue, organs and system), Morphology & function of cell, types and importance of Intracellular junction, transport mechanism across the cell, Chemical messengers, Ion channels in the cell and their physiological importance.

Unit-II

Circulatory system:Introduction, objectives, functional organization, initiation of heart beat, electrocardiogram, heart as a pump, cardiac output, haemodialysis, blood pressure, special circulation.

Blood: Introduction, objectives, Composition of blood, red blood, White blood , blood coagulation,

Unit-III

Respiratory system: Nasal cavity, Larynx, Trachea, Lungs, Diaphragm Respiration,

Unit-IV

Digestive system: Introduction (Oral cavity & palate, Pharynx and Esophagus, Stomach and Intestine, Glands of digestive system), structure of G.I tract, functions, motility/movement, secretion, digestion, and Absorption. Regulation of secretions and movement, details of individual organ structure and function

Unit-V

Kidney: Introduction, objectives, functional anatomy of kidney, mechanism of urine formation

Unit-VI

Reproductive system: Male reproductive system, Female reproductive system

Unit-VII

Nervous system: Brain and its part, Ventricles of the brain, Spinal cord, Cranial nerves, Peripheral nerves, Automatic nervous system

Unit-VIII

Endocrine system: Introduction, objectives, importance of endocrine glands, endocrine hormones, classification & functions, target organs.

Practical **Total Mark: 20/1 credit**

a. Study of animal Cell/Tissue

b. Study of digestive system

c. Study of RBC and WBC

d. Study of endocrine gland

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

Semester-1: Core 1 NHS-VC-1026: Biochemistry

Unit I =1 Credit, Unit II +III=1 Credit, Unit IV+V=1 Credit, Unit VI+VII=1 Credit

Total Marks:100
Theory (Total marks: 60/04 Credit)

Unit – I

Introduction to Biochemistry Laboratory: Laboratory safety instructions and First Aid Identification of chemicals, equipments, glassware etc., maintenance of stock book, storing, issue, condemnation of broken and useless items etc., Purity of reagents and chemicals.

Glassware & Plastic ware: Identification of Laboratory glassware, drawing diagrams of variousglasswarelike different types of pipettes, burettes, conical flasks, beakers, funnel, test tubes, centrifuge tubes, etc. Plastic ware inlaboratory. A-Glass, B-Glass and unmarked glass, Soda glass, Borosilicate glass, fintglass etc., Automatic pipettes, burettes and sample dispensers, methods to use all the above. Cleaning solutions: cleaning glassware and plastic ware, different cleaning solutions. Washing, rinsing and drying the glassware and plastic ware.

Unit – II

Preparation of solution

Units and Measurements: SI Units, Units for mass and weight, volume, length and time. Balance: Use of common balance, electric balance Perishable and refrigerated chemicals and their handling Preparation of Standard solutions: Molar and Normal solutions, Molecular weight, Valency, Equivalent weight, preparation of 0.1 N Oxalic acid, 0.5M NaCl etc., % solutions, hygroscopic compounds, preparation of 0.1N NaOH, 0.1N HCl Titrations: Acid-alkali titrations, use of indicators, calculations.

pH and buffers: Concept of titrable acidity, alkalinity and pH.

Unit –III

Maintenance and usage of lab equipments

Instruments: Use of maintenance of centrifuge, ovens, incubator, water baths, cold centrifuge, ultracentrifuge, water distillation units, water deionizer, desiccators, desiccants etc.

Colorimetry, Absorbtiometry: Introduction to Absorbtiometry and Colorimetry. Maintenance of colorimeters and spectrophotometers, Spare parts for these equipments, verification of Beer's law. Fluorimetry, Neghlometry, conductometry, dialysis, ultra filtration flame photometry, turbidometryetc

Unit – IV

Carbohydrate &Lipid metabolism: Definition, chemistry, digestion, Absorption, storage and utilization, normal blood suger, estimation of blood suger, methods – modified Folin-Wu method, classification lipid peroxidation, Functions of lipid in general, fats and cholesterol in particular, Essential fatty acids and their importance, dietary sources of lipoproteins, Hyperlipoproteimemias, Denovo synthesis of fatty acid as alternate energy source: metabolism of ketone bodies, Lipids in coronary heart disease and cancer, important metabolic disorder: Fatty liver and ketosi

Unit – V

Kidney function test: Definition, chemistry, estimation of blood urea, determination by Hench-Aldrich method, Diacetylmonoxime method, Urease and Bertholet reaction, Estimation of Serum Creatinine

Unit – VI

Abnormal constitute of urine: Qualitative Tests

Unit – VII

Collection of specimen, storage and mailing, Quality control

Practical **Total Mark: 20/1 credit**

1. Preparation of Standard solutions: Molar and Normal solutions, Preparation of buffers of different pH and morality, Preparation of percentage solution.
2. Preparation of sample, reagent and estimation of Glucose by all the methods
3. volumetric titrations
4. Estimation of Urea
5. Estimation of Creatinine.
6. Abnormal urine Qualitative tests
7. Identification and working principles of lab equipments
8. stimation of SGOT& SGPT
9. Estimation of Protein
10. Estimation of Bilirubin

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

Semester-1: Core 1 NHS-VC-1036: Microbiology-I

Unit I +II=1 Credit, Unit III+IV=1 Credit, Unit V=1 Credit, Unit VI=1 Credit

Total Marks:100

Theory (Total marks: 60/04 Credit)

Unit – I

Simple & Compound microscope, Binocular microscope, Triocular microscope, Fluorescence microscope & Dark field microscope, Electron Microscope Handling and Maintenance ofmicroscope

Unit – II

Types of Sterilization- Dry Sterilization, Moist Sterilization, Mechanical Sterilization, Chemical Sterilization, Filtration Sterilization, Gas Sterilization

Unit – III

Space, Ventilation, Light, Water, Working bench Safety precaution in a Bacteriology laboratory, Staining - Preparation of stains, Simple stain, Special stain, Gram's stain, Albert'sstain,ZNstain,ModifiedZNstain&Lactophenolcottonblue

Unit – IV

Morphology and distribution of bacteria: Cocci- Gram's positive Cocci, Cocci – pairs. Chains and clusters arrangement & Gram's negative Cocci – kidney shape intracellular**, Bacilli -**Gram's positive Bacilli – clostridia species , Gram's negative Bacilli,Entero- bactericea& others Yeast and Molds (fungi) & Virology – cell line

Unit – V

General properties of Bacteria: Food, Moisture, Hydrogen ion concentration, Oxygen requirement, Carbon dioxide, Temperature, Light, Symbiosis, Product of Bacterial growth.

Unit-VI

Preparation of culture media - Nutrient broth, Nutrient agar, Blood agar, Chocolate agar, Mac Coney's agar, SSA, XLD, TCBS, Tellurite agar, EMB agar, MHA, RCM, Alkaline peptone water, Thioglycolate, LJ-media, Peptone, Mannitol, TSI, Citrate, Urease & SDA

Practical **Total Mark: 20/1 credit**

1. Cleaning of articals, packing, distribution of articals, loading the articles, hot air oven, Autoclave etc and sterilization
2. Preparation of stains: simple stain, differential stain, Albert's stain, ZN stain, Modified ZN stain & Lacto phenol cotton blue
3. Preparation, fixation and staining of smear microscopy

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

AEC-1014: Communicative English

UNIT I+II=2 CREDIT, UNIT III+IV=1 CREDIT, UNIT V=1 CREDIT
Total Marks:40/04 Credit

Unit I: Communication in General

The meaning process of communication types of communication, interpersonal skill and elements communication.

Unit II: Interpersonal Communication and Effective communication

The skills of Interpersonal communication, communication as a skilled behavior, Effective communication, guidelines for effective communication.

Unit III Situation Language

Greetings, Introduction, Inviting someone, making requests, offering help and assistance, seeking permission, asking for advice, expressing gratitude, persuasion, complimenting and congratulating, expressing sympathy and condolence, complaining, apologizing, making suggestion, warning, , ending a conversation, asking for information, opinion, excuse, preference. Requesting, asking if someone agree and if obliged. Describing something and some useful expressions.

Unit IV: Expectations in communication

Brainstorming, having realistic expectations, communication breaks down because of unrealistic or great expectations

Unit V: The art of coding and decoding and describing and evaluating behavior.

The need for proper coding and decoding, effective criticism and effective criticism made easy, delivering negative feedback, after delivering negative feedback.

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

Semester-2: Core 1 NHS-VC-2016: Clinical Pathology

UNIT I+II=1 CREDIT, UNIT III+IV=1 CREDIT, UNIT V+VI+VII=1 CREDIT, UNIT VIII+IX+X=1 CREDIT

Total Marks:100
Theory (Total marks: 60/04 Credit)

Unit-I

Introduction: Clinical laboratory diagnosis, laboratory apparatus, lab accidents-cause and prevention, First-Aid, washing of laboratory apparatus

Unit – II

The constituents of blood: RBC, WBC, Platelet and plasma**,** function of plasma, RBC or Erythrocyte– the structure and physiology, functions. WBC or Leucocytes – Neutrophils, Lymphocyte, Monocyte, Eosinophil and Basophil. Platelets. General account of Anemia.

Unit – III

Anticoagulant or calcium chelaters: Oxalates, Ammonium Oxalates, Potassium Oxalates, Balanced Oxalates, EDTA (Ethylene Diamine Tetra Acetic acid), sodium citrate, and Heparin

Unit – IV

Types of stains and preparation: Wright's stain. Leishman's stain, Geimsa's stain Field's stain

Unit –V

Blood collection, Preparation of smear and staining of a blood smear: thick smear and thin smear, mounting and preservation of smear

Unit – VI

Red Blood cells count: Improved Neubauer Chamber, cover slip, diluting fluids,dilution, charging, counting. W BC diluting fluids, dilution, charging, counting, and Platelets diluting fluids, dilution, charging,counting

Unit – VII

Estimation of hemoglobin: definition hemoglobin. Methods of estimation of hemoglobin – Colorimetric method- Tallqvist method, Sahli's or Acid Haematin method, alkaline haematin method, Haldane method, Dare method, Spencer method, Photo electric method,

Oxyhaemoglobin method, Cyanmetheamoglobin method, preparation of standards, Specific gravity method, and Chemical method

Unit – VIII

Estimation of PCV or Haematocrit and erythrocyte indices: methods of Estimation of PCV or Haematocrit, Wintrobe's method, Microhaematocrit or capillary method, Mean corpuscular volume (MCV) Mean corpuscular hemoglobin (MCH) Mean corpuscular hemoglobin concentration (MCHC)

Unit – IX

Erythrocyte sedimentation rate (ESR): methods of estimation of ESR, factor influencing sedimentation, laboratory factors which influence ESR, importance, clinical significance

Unit – X

Urine and fecal examination: physical & microscopic examinations

Practical **Total Mark: 20/1 credit**

1. Blood collection technique
2. Preparation and staining of blood smear
3. RBC, WBC and Platelet count
4. Estimation of hemoglobin by Sahli's method &Cyanmetheamoglobin
5. Blood grouping front and back typing
6. Rh typing and Du test
7. Urine examination and fecal examination

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

Semester-2: Core 1 NHS-VC-2036: Histopathology and Cytology

UNIT I=1 CREDIT, UNIT II+III=1 CREDIT, UNIT IV=1 CREDIT, UNIT V=1 CREDIT

Total Marks:100
Theory (Total marks: 60/04 Credit)

Unit-I

Cell structure and its function

Fixatives: Definition of fixatives, its aims and objective, classification of fixatives Simple fixative – Aldehydes

Compound fixatives – classification of compound fixative

a) Micro anatomical fixatives – 10% formalin, 10% formal saline, and 10% buffered formalinetc

b) Cytological fixatives – classification of cytological fixative: Nuclear fixative, Cytoplasmic fixative , Histochemicalfixative

Unit-II

Tissue processing: Collection, Labeling and Fixation of specimen; Dehydration; Dehydrating agents; Clearing; Impregnation and infiltration; Embedding

Unit-III

Section cutting: Microtome knives, sharpening, honing and stropping, fine trimming, fine cutting and picking up sections; Microtome's and Technique of section cutting

Unit – IV

Dyes and their properties

Purpose of staining, physical and chemical theory of staining.

Classification of dyes – natural dye, haematixilin& Eosin staining, Types of Eosin and their preparation

Unit – V

Exfoliative cytology, collection, preservation, fixation and production of smear – papanicolou's staining procedure.

Practical **Total Mark: 20/1 credit**

1. Preparation of fixative
2. Preparation of de-calcifier
3. Tissue processing – dehydration, clearing impregnation, Embedding
4. Microtome's and sharpening of theit knives
5. Technique of section cutting
6. Staining–

a) H&Estaining
b) PASstain,
c) VAN Gibsonstain,

d) Papanicalaoustaining

e) Exfoliativecytology

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

AEC-2014: Environmental Studies

Unit I+ II=1 Credit, Unit III+Iv=1 Credit, Unit V=1 Credit, Unit VI+VII=1

Total Marks: 40/04 Credit

Unit – 1:

The multidisciplinary nature of environmental studies Definition, scope and importance. Need for Public awareness.

Unit – 2

Natural Resources:

Renewable and non renewable resources. Natural resources and associated problems

a. Forest Resources : use and over- exploitation , deforestation, case studies. Timber extraction ,mining, dams and their effects on forest and tribal people.

b. Water Resources : use and over- exploitation of surface and ground water, floods, droughts, dams - benefits and problems.

c. Mineral Resources: use and exploitation, environmental effects of extracting and using mineral resources, case studies- with reference to Karnataka

d. Food Resources: World food problems, changes caused by agricultural and overgrazing. Effects of modern agriculture, fertilizer - pesticide problems, water logging, salinity, case studies.

e. Energy Resources: growing energy needs, Renewable and non renewable energy resources, use of alternate energy sources, case studies.

f. Land Resources: Land as a resource, land degradation, (man induced landslides), soil erosion and desertification.

Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

Unit - 3

Ecosystem: Concept of an ecosystem. Structure and function of an ecosystem, Producers , consumers and decomposers. Energy flow in an ecosystem. Food chains, food web and ecological pyramids. Introduction , types , characteristic feature, structure and function of the following ecosystem

1. Forest ecosystem
2. Grassland ecosystem
3. Desert ecosystem
4. Aquatic ecosystem (ponds)

Unit – 4

Biodiversity and its Conservation:

Introduction - Definition, genetic, species, ecosystem diversity. Biogeographically classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option value. India as a mega - diversity nation.

Hot - spots of Biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In - situ and Ex - situ conservation

Important National Parks of India

1. Nagarahole National Park 2. Bandipur National Park
3. Gir National Park 4. Kaziranga National Park 8 hrs

Unit – 5

Environmental Pollution:

Definition-causes, effects and control measures of :

a. Air Pollution b. Water Pollution
c. Soil Pollution d. Marine Pollution
e. Noise Pollution f. Thermal Pollution
g. Nuclear hazards

Solid Waste management : causes , effects and control measures of urban and industrial wastes

Role of an individual in prevention of pollution

Pollution case studies with respect to India. Examples

1. Bhopal Gas Tragedy
2. Photochemical smog of Mumbai
3. River Ganga pollution

Disaster Management : floods , earthquakes, cyclones and landslides

Disaster Management information systems and efforts of Indian government to tackle the problem

Unit – 6 :

Social issues and the Environment:

From unsustainable to sustainable development. Urban problems related to energy Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people, its problems and concerns, case studies. Environmental ethics: issues and possible solutions

Climate changes: global warming. acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. Wasteland reclamation. Consumerism and waste products Environmental Protection Act. Air (Prevention and Control of Pollution) Act

Water (Prevention and Control of Pollution) Act. Wildlife Protection Act

Forest conservation Act. Issues involved in enforcement of environmental legislation. Public awareness

Unit – 7

Human Population and the Environment:

Population growth, variation among nations. Population explosion, Family welfare Programme.

Environment and human health, Human Rights, Value Education.HIV/AIDS

Women and child welfare. Role of information technology in environment and human health

Case studies

Internal Assessment **Total mark: 20/1 credit**

Hospital Posting: 15 days

Semester-3: Core 1 NHS-VC-3016: Nutrition & Diabetics Educator-I

UNIT I+II+III=1 CREDIT, UNIT IV+V+VI=1 CREDIT, UNIT VII+VIII+IX=1 CREDIT, UNIT X+XI+XII=1 CREDIT

Total Marks:100
Theory (Total marks: 60/04 Credit)

Unit I: An Insight on nutrition

Balanced diet, knowledge of different food groups and their nutritive values
Functions of food in relation to health - classification of foods, based on nutrients.
Food groups - Basic five, the food pyramid.

Unit II: Understanding and knowledge on macronutrient and micronutrients

Nutritive value of Macronutrient and their conversion to nutritive molecules, (Carbohydrates, Protein, Lipids), Nutritive value of Micronutrient and their importance

Unit III: Management of nutrition – calorie, diet sheet

Understanding of proximate composition, balanced diet, calorie calculation of foods, food exchange list, Recommended Dietary guideline

Unit IV: Regulation of Fluid and Electrolyte balance

Electrolytes, sodium, potassium, chloride, water, role of kidney

Unit V: Neutraceutical requirements:

Antioxidants, Immune boosters, Prebiotics & Probiotics

Unit VI: Food, Nutrient and Drugs Interactions

Do's and don'ts during diet planning for treatment of patients, Effects of drugs on nutrients

Unit VII: Role of educator in controlling Diabetics

Multidisciplinary team approach to Diabetes Education describing the diabetes disease process and treatment option. Incorporating appropriate nutrition management. Goal setting to promote health, problem solving and daily living.

Unit VIII: Public Health Problems

Identifying individuals at high risk for type 2 Diabetes, Evidence for type 2 Diabetes prevention. The Community and health care facility.

Unit IX: Nutritional disorders

Disease due to deficiency of macronutrient and micronutrient

Unit X: Therapeutic Nutrition

Nutritional assessments of patients , Rights of the patients, Basic Knowledge on nutrition assessments of patients(energy, protein or any specific nutrient requirements/restrictions)

Unit XI: Pathophysiology of Diabetes

Types and causes, Disease process, Diagnostic criteria, Screening for Diabetes – why, when and how? (Urine sugar and blood sugar), Continuum of care (primary, secondary, tertiary, prevention)

Unit XII: Management of Diabetes

Overview: Aims of treatment, the importance of overall metabolic control, internationally recognized standards of care. The evidence for good control, physical assessment and laboratory assessment

Practical **Total Mark: 20/1 credit**

a. Study of different types of food source (carbohydrate, protein, fat and vitamins)
b. Urine and Blood sugar test
c. Albumin test (Urine)
d. Study of laboratory instruments

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

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Semester-3: Core 1 NHS-VC-3026: Cardiac Technology-I

UNIT I+II+III=1 CREDIT, UNIT IV+V+VI=1CREDIT, UNIT VII+VIII=1 CREDIT, UNIT IX+X=1 CREDIT

Total Marks:100
Theory (Total marks: 60/04 Credit)

Unit I: Introduction to Cardiovascular Diseases:

Types of Cardiovascular disease, causes, symptoms and treatment

Unit II: Anti-failure agents

Diuretics-furosemide, torsamide, thiazide diuretics, metolazone, spironolactone, combination diuretics Angiotensin converting enzyme (ACE) inhibitors – captopril , Enalapril, ramipril, lisinopril, ACE inhibitors for diabetics and hypertensive renal disease , Digitalis and acute ionotropes – digoxin, odoubutamine, dopamine, adrenaline, noradrenaline, isoprenaline

Unit III: Anti-hypertensive drugs

Diuretics, beta-blockers, ACE inhibitors, calcium antagonists, direct Vasodilators, centrally acting and peripherally acting vasodilators.

Unit IV: Anti- arrhythmic agents

Amiodarone, adenosine, verapamil, dilteazem, lidocaine, mexiletine,Phenytoin, flecainide, bretylium,atropine

Unit V: Antithromboticagents

Platelet inhibitors: aspirin, clopidogrel ,Anticoagulants: heparin, low molecular weight heparin, warfarin **Fibrinolytics:** streptokinase, urokinase , glycoprotein 2b3a

antagonists: abciximab, tirofiban,eptifibatide

Unit VI: Lipid lowering and anti-atherosclerotic drugs

statins, exetimibe, niacin, fenofibrate

Unit VII: Miscellaneous drugs

Protamine , Narcotics: morphine, pethidine, fentanyl , Sedatives: diazepam, midazolam Steroids: hydrocortisone, oprednisolone, Antihistamines: diphenhydramine , Antibiotics: pecicillins, cephalosporins, aminoglycosides , Antacids and proton pump inhibitors , Anaesthetic agents: local general

Unit VIII: medical electronics, biophysics and computer usage relevant to cardiac technology

Introduction to medical physics, Blood pressure recording, Pressure transducers, Defibrillators, Cathode ray tubes and physiological monitors, Impedenceplethysmo - graphy, Pulse oximetry. Medical ultrasound and Doppler, Ionic currents and Electrocardiography, Electrocardiographic processing and display system, Radiation physics, Techniques of monitoring radiation exposure. Measures to reduce radiation exposure, Computer use in medical care and data entry.

Unit-IX : BASIC ELECTROCARDIOGRAPHY (ECG)

Fundamental principles of electrocardiography, Cardiac electrical field generation during activation, Cardiac wave fronts, Cardiac electrical field generation during ventricular recovery. Electrocardiographic lead systems, Standard limb leads, Precordial leads and the Wisdom central termina , Augmented limb leads, The hex axial reference frame and electrical axis , Recording adult and pediatric ECGs ,The normal electrocardiogram ,Atrial activation, The normal P wave , Artialrepolarisation , Atrioventricular node conduction and the PR segment,Ventricular activation and the QRS complex, Ventricular recovery and ST-T wave, U wave, Normal variants, Rate andrhythm

Unit-X: ADVANCED ELECTROCARDIOGRAPHY (ECG)

The abnormal electrocardiogram, Left atrial abnormality,Right atrial abnormality,Left ventricular hypertrophy and enlargement,Right ventricular hypertrophy and enlargement Intraventricular conduction delays ,Left anterior fascicular block,Left posterior fascicular block ,Left bundle branch block ,Right bundle branch block ,Myocardial ischemia and infarction ,Repolarization (ST-Twave) abnormalities,QRS changes,Evolution of electrocardiographic changes,Localization of ischemia or infarction,Non-infarction Q waves, Primary and seconday T wave change,Electrolyte and metabolic ECG abnormalities,Cardiac arrhythmias ,Ventricular premature beats,Supra-ventricular tachycardias,Atrial flutter/fibrillation ,Ventricular Tachycardia/Ventricular fibrillation, Atrio Ventricular block ,Prolonged PR interval, Mobitz type 1 and 2 block,Complete heart block,Direct Current (DC) shock ,Defibrillator, Monophasic andbiphasic shock,Technique of cardioversion,Indications for cardioverion.

Practical **Total Mark: 20/1 credit**

a. Study of different equipments for cardio vascular test

b. Measurement of blood pressure and oxygen level of different age group

c. Demonstration of ECG

d. Study of Electrocardiograph of different age group

e. Study of heart rate and kymograph

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

Semester-3: Core 1 NHS-VC-3036: Quality in Health Care- Documentation& Hospital Infection Control

UNIT 1=1 CREDIT, UNIT II= 1 CREDIT, UNIT III= 1 CREDIT & UNIT IV=1 CREDIT

Total Marks:100
Theory (Total marks: 60/04 Credit)

Unit-I

Documentation in Health Care: Definition, Principles of documentation, aim and Scope,Quality of care

Unit-II

Clinical Documentation: Clinical documentation (CD) in the creation of a digital or analog, a medical treatment, medical trial or clinical test

Unit-III

Medical Record Documentation: Purposes of Documentation in Medicine, Function of Medical Documentation, General Principles

Unit-IV

Aspects of Documentation: Ethics and Documentation, Patients Health Care Information , Common standards for documentation, Skills Used in Documentation, Legal Protection in documentation, Institutional Protocols and documentation, Rules in keeping medical records , Legal Aspects of Charting, Documentation for Medical Billing and Coding

Practical **Total Mark: 20/1 credit**

a. Sample survey for medical record and clinical documentation

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

Semester-3: XXX-SE-3XX4: Computer Application

UNIT I+ II=1 CREDIT, UNIT III=1 CREDIT, UNIT IV=1 CREDIT, UNIT V=1 CREDIT

Total Marks:80
Theory (Total marks: 40/04 Credit)

UNIT 1

Introduction to computer: history of computers, generations of computers, classification of computers, application areas of computer, functional block diagram of computers, components of computer in detail. Types of computer memory - Primary memory, RAM and ROM and their types, storage capacity of memory, speed of computer.

UNIT II

Computer hardware devices – input devices - keyboard, mouse, track ball, joystick, touch screen, digitizing tablet, light pen, scanner, encrypted plastic cards, video input, and voice/audio input devices. Output devices – visual display unit, printers, types of printers, plotter, sound cards and speakers, 3d audio. Secondary memory - magnetic tape, hard disk, floppy disk, zip disk, jaz disk, super disk, optical disk

UNIT III

Data representation on computer : computer words, number system: introduction, decimal number system, binary number system, octal number system, hexadecimal number system, BCD, GRAY code, inter-conversion of number systems, ASCII code, EBCDIC code. Computer software : definition, software types- application software and system software, programming languages - low level languages, assembly level language, high level language, translator – compiler, interpreter, assembler

UNIT IV

MS-Windows: Operating system-Definition & functions, basics of Windows. Basic components of windows, icons, types of icons, taskbar, activating windows, desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel – display properties, adding and removing software and hardware, setting date and time, screensaver and appearance using windows accessories

UNIT V

Documentation Using MS-Word - Introduction to word processing interface, Toolbars, Menus,Creating & Editing Document, Formatting Document, Finding and replacing text, Format painter, Header and footer, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Previewing and printing document,

Advance Features of MS-Word-Mail Merge, Tables, File Management, Printing, Styles

Practical **Total Mark: 20/1 credit**

1. MS-DOS
- Exploring important commands

2 MS-Windows
- Components of Windows
- Exploring different tools of Windows
- Exploring icons in Windows
- Managing files in Windows
- Shortcuts in Windows

3 MS-WORD
- Formatting in MS Word
- Report writing using MS Word
- News paper publication using MS Word
- Tabulation in MS Word
- Drawing Tools in MS Word
- Mail merge in MS Word
- Linking pages from different files in MS Word

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

Semester-4: Core 1 NHS-VC-4016: Nutrition & Diabetics Educator-II

UNIT I+II= 1 CREDIT, UNIT III+IV=1CREDIT, UNIT V+VI=1 CREDIT, UNIT VII+VIII=1 CREDIT

Total Marks:100
Theory (Total marks: 60/04 Credit)

Unit I: Introduction to therapeutic diet;

a) Dietary supplements, types of supplements, Adjuncts to diet therapy, Food and drug interactions, Routine hospital diets

b) Enteral nutrition, oral supplements, tube feeding and types of food for tube feeding Parenteral feeding, Total Parenteral Nutrition(TPN) TPN formula for children and adults, Pre and Post-operative diets.

Unit II: Diet in Infections and Fevers;

Causes, Types, General dietary guidelines, Diet in typhoid, Influenza, Malaria, Tuberculosis, AIDS

b) Diet in malabsorption; Steatorrhoea, lactose intolerance, coeliac disease, tropical sprue, Irritable bowel syndrome, inflammatory bowel diseases, intestinal gas and flatulence.

Unit III: Diet in Diabetes Mellitus;

a) Prevalence, Types, Aetiology, Symptoms, Diagnosis, Glycemic index, Glycemic load of foods, Blood glucose Monitoring

b) Dietary principles and Nutritional management, Glycemic index, Glycemic load of foods, Artificial sweeteners, complications

Unit IV: Diet in Kidney Diseases;

a) Biochemical assessment of kidney function, Clinical symptoms,

b) Principles of dietary management for acute and chronic renal failure, Dialysis--- their types, and dietary management, Renal calculi and dietary guidelines for its treatment & prevention

Unit V: Special considerations

Diabetes in children and adolescents, Diabetes in pregnancy, Diabetes in the elderly, Diabetes & infection, Diabetes in people living in poverty, surgical considerations in Diabetes.

Unit VI: Educational and behavioral interventions

Principles and practice of patient education, Measure and document patient outcomes, Problems and psychological evaluation in the diabetic patient, Strategies for behavioral changes, Managing stress

Unit VII: Diabetes & Dental Care

Definition, preventive measures for dental problems, important aspects of oral hygiene, nutritional modification and appropriate instruction for treating periodontal disease.

Unit VIII: Practical management of Diabetes

Dietary management, insulin and oral therapy, Avoiding and managing hypo and hyperglycemia, Self-management strategies during special situations (sick days, travel, hypoglycemic events, etc), Self-monitoring (glycemic control & complications related to diabetes), Lifestyle issues, Newer trends in management.

Practical **Total Mark: 20/1 credit**

a. Determination of TPN
b. ELISSA Test
c. Widel Test
d. Creatinine test

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, midterm examination, seminar/ presentation, attendance & group discussion

Semester-4: Core 1 NHS-VC-4026: Cardiac Technology-II

UNIT 1+II=1 CREDIT, UNIT III+IV=1 CREDIT, UNIT V+VI= 1CREDIT, UNIT VII+VIII=1 CREDIT

Total Marks:100
Theory (Total marks: 60/04 Credit)

Unit I: Valvular heart disease

Etiology, Acquired valvular heart disease , Rheumatic fever and rheumatic heart disease , Aortic stenosis ,Aortic regurgitation ,Mitral valve disease ,Mitral stenosis, Mitral regulation ,Mitral valve disease ,Tricuspid valve disease ,Infective endocarditis Valvuloplasty and valve surgery

Unit-II : Coronary artery diseases: Pathophysiology& clinical recognition, Angina

pectoris, symptomatic & asymptomatic myocardial ischemis,types and locations of myocardial infractions, thrombolytic therapy ,medical treatment, percutaneous interventions, surgical treatment, cardiac rehabitation

Unit III: Systemic hypertension : Essential and secondary hypertension

Unit IV: Heart failure :Surgical and medical treatment

Unit V: Myocardial diseases

Dilated cardiaomyopathy, Hypertrophic cardiaomyopathy, Restrictive cardiaomyopathy , Myocarditis

Unit VI: Pericardial Diseases

Pericardial effusion, Constrictive pericarditis , Cardiac tapenade

Unit VII: Electrical disturbances of the heart : Sinus node dysfunction, Arrhymias and

conduction disturbances , Treatment of arrhythmias – pharmacological, radiofrequency ablation and surgery

Unit VIII: Pulmonary hypertension : Primary pulmonary hypertension ,Pulmonary Thromboembolism

Practical **Total Mark: 20/1 credit**

a. Study of Rheumatic factor
b. Demonstration of Pulmonary cardiomyopathy
c. Demonstration of pulmonary hypertension

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

Semester-4: Core 1 NHS-VC-4036: Quality in Health Care- Bio-waste& Hospital Infection Control

Unit I=1 Credit, Unit II=1 Credit, Unit III=1 Credit, Unit IV=1 Credit
Total Marks:100
Theory (Total marks: 60/04 Credit)

UNIT 1 Bio-waste: Types, medical bio-waste, sources, Effects on human

UNIT 2: Bio-waste Management and Control, On-site versus off-site, Generation and accumulation,Storage & Handling,Treatment

UNIT 3: Country-wise regulation and management with special reference to United Kingdom(UK)(England),United States of America, India, Singapore

UNIT 4: Environmental impacts: The syringe tide environmental disaster, Effects of medical waste on the environment,Incineration of biomedical waste-Methods of biomedical waste incineration,Impact on the environment,Environmental waste in India-Medical waste management program,Environmentally friendly alternatives,Other possible solutions

Practical **Total Mark: 20/1 credit**

a. **Study of different bio and medical waste**
b. **Field study**

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

Semester-4: XXX-SE-4XX4: O. T. & Dialysis

Unit I+II= 1 Credit, Unit III=1 Credit, Unit IV= 1 Credit, Unit V=1 Credit

Total Marks:80
Theory (Total marks: 60/04 Credit)

Unit I: Anatomy & Physiology(normal kidney structure and functions) Derangement of kidney functions (etiology, clinical manifestation, diagnosis of acute and chronic renal failure)

Unit II:

Dialysis - the concept (Brief history, definition, mechanism) Components of Dialysis- Access, blood flow, anticoagulant, dialsate)

Unit III:

Hemodialysis –Basics (Blood circuit: tubing, pump, dialyzer, flow rate, dialysate circuit, concentrates, delivery systems, flow rate)

Unit IV: Anticoagulation (Heparin, alternatives to Heparin, regional no anticoagulation) Vascular access (Temporary, Permanent

Unit V: Dialysis water and water treatment Dialysis and Dialyzer (including reuse) Hemodialysis machine

Internal Assessment **Total mark: 20/1 credit**

Hospital Posting: 15 days/ Project/Internship: 1 months

Semester-5: DSE 1 NHS-VC-5016: Nutrition and Diabetic Education-III

UNIT I=1 CREDIT, UNIT II+III=1 CREDIT. UNIT IV+V=1 CREDIT, UNIT VI+VII=1 CREDIT

Total Marks:100
Theory (Total marks: 60/04 Credit)

Unit I: COMMUNITY NUTRITION

Nutrition and health in National development. Malnutrition- meaning. Factors contributing to malnutrition, over nutrition. Nutritional disorders- Epidemiology, clinical features, prevention and dietary treatment for Protein Energy malnutrition, nutritional anaemia's& vitamin deficiency disorders. Methods of assessing nutritional status: Sampling techniques, Identifications of risk groups, Direct assessment - Diet surveys, anthropometric, clinical and biochemical estimation. Indirect assessment- Foodbalance sheet, ecological parameters and vital statistics.

Unit II:

Nutrition in burns and surgery. Nutrition - Addictive behaviour in anorexia, nervosa, bulimia & alcoholism. Nutrient drug interaction. Feeding the patients - Psychology of feeding the patient, assessment of patient needs. Feeding infants & children - problems in feeding children in hospitals. Nutrition & diet clinics - Patients checkup and dietary counseling, educating the patient and follow up.

Unit III: BASIC DIETETICS:

Role of dietarian : The hospital & community, Basic concepts of diet therapy, Principles of diet therapy & therapeutic nutrition for changing needs, Adaptation of normal diet for changing needs, Routine hospital diets - Regular diet, light diet, full liquid and tube feeding, Modification of diet - Febrile conditions, infections and surgical conditions, Diets for gastro - intestinal disorders, constipation, diarrhoea, peptic ulcer, Diet for renal diseases - Nephritis, Nephritic syndrome and renal failure, Diet for obesity and cardiovascular disorders, Diet for Diabetes mellitus, Diet & nutrition in kidney diseases, Nutrition in cancer, Nutrition in Immune system dysfunction, AIDS &Allergy,Nutrition support in metabolicdisorders.

Unit IV: Hypoglycemia & Hyperglycemia:

Causes, Symptoms, Prevention & Treatment.

Developing an Individualized meal plan: Diet order, Menu setting, Supervising the diets

Unit V: Standardization of recipe

To plan, calculate, calculate the nutritive value and demonstrate.

Unit VI: Diabetes & Dental Care:

Definition, preventive measures for dental problems, important aspects of oral hygiene, nutritional modification and appropriate instruction for treating periodontal disease

Unit-VII:

Developing an individualized meal plan: Diet order, Menu setting, Supervising the diets

Practical **Total Mark: 20/1 credit**

a. Field study on Community Nutrition

b. Calculations and demonstration of nutritive value of food sources

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

Semester-5: DSE 1 NHS-VC-5026: Cardiac Technology-III

Unit I=1 Credit, Unit II=1 Credit, Unit III=2 Credits

Total Marks:100
Theory (Total marks: 60/04 Credit)

Unit I: medical electronics, biophysics and computer usage relevant to cardiac technology

Introduction to medical physics, Blood pressure recording, Pressure transducers, Defibrillators, Cathode ray tubes and physiological monitors, Impedenceplethysmo - graphy, Pulse oximetry. Medical ultrasound and Doppler, Ionic currents and Electrocardiography, Electrocardiographic processing and display system, Radiation physics, Techniques of monitoring radiation exposure.Measures to reduce radiation exposure, Computer use in medical care and data entry.

Unit-II : BASIC ELECTROCARDIOGRAPHY (ECG)

Fundamental principles of electrocardiography, Cardiac electrical field generation during activation, Cardiac wave fronts, Cardiac electrical field generation during ventricular recovery. Electrocardiographic lead systems, Standard limb leads, Precordial leads and the Wisdom central termina , Augmented limb leads, The hex axial reference frame and electrical axis , Recording adult and pediatric ECGs ,The normal electrocardiogram ,Atrial activation, The normal P wave , Artialrepolarisation , Atrioventricular node conduction and the PR segment,Ventricular activation and the QRS complex, Ventricular recovery and ST-T wave, U wave, Normal variants, Rate andrhythm

Unit-III ADVANCED ELECTROCARDIOGRAPHY (ECG)

The abnormal electrocardiogram, Left atrial abnormality,Right atrial abnormality,Left ventricular hypertrophy and enlargement,Right ventricular hypertrophy and enlargement Intraventricular conduction delays ,Left anterior fascicular block,Left posterior fascicular block ,Left bundle branch block ,Right bundle branch block ,Myocardial ischemia and infarction ,Repolarization (ST-Twave) abnormalities, QRS changes, Evolution of electrocardiographic changes,Localization of ischemia or infarction,Non-infarction Q waves, Primary and seconday T wave change, Electrolyte and metabolic ECG abnormalities,Cardiac arrhythmias ,Ventricula premature beats,Supra-ventricular tachycardias, Atrial flutter/fibrillation ,Ventricular Tachycardia/Ventricular fibrillation, Atrio Ventricular block ,Prolonged PR interval, Mobitz type 1 and 2 block,Complete heart block,Direct Current (DC) shock ,Defibrillator, Monophasic andbiphasic shock,Technique of cardioversion,Indications for cardioverion

Practical **Total Mark: 20/1 credit**

a. **Demonstration of blood pressure recording and Pressure** transducers
b. **Demonstration of ultrasonography**

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

Semester-5: DSE 1 NHS-VC-5036: Quality in Health Care- Work place& Hospital Infection Control

UNIT 1=2 CREDIT, UNIT II= 1 CREDIT, UNIT III=1 CREDIT & UNIT IV=1 CREDIT
Total Marks:100
Theory (Total marks: 60/04 Credit)

Unit-I

Quality in Health: Definition**,** Importance**,**Significance, Tools or indicators, Customer satisfaction, Feedback

Unit-II

Patient perspectives and quality Health Care: Determinant in quality health care**, Short** and long-term policy, patient satisfaction survey

Unit-III

Access to Health Services: Effective, Patient centered, cost effectiveness, Efficient and Equitable, Timely service

Unit-IV

Health Insurance: Definition, importance, plans of health insurance, health scenario in India and other developed countries.

Practical **Total Mark: 20/1 credit**

a. **Case study and submission of report**

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

Semester-5: XXX-SE-5XX4: CSSD Technology-I

UNIT I = 1 CREDIT, UNIT II+III=1 CREDIT, UNIT IV=1 CREDIT, UNIT V=1CREDIT

Total Marks:80
Theory (Total marks: 60/04 Credit)

Unit I: Hospital infection control

Epidemiology of nosocomial infections, Prevention of common endemic nosocomial infections, Nosocomial infection surveillance, Dealing without breaks Prevention of nosocomial infection, Infection control programmes, Infection control precautions in patient care, Environment. Antimicrobial use and antimicrobial resistance, Preventing infections of staff

Unit II: CSSD equipment handling & maintenance

Introduction to CSSD, Types of Sterilizer, Operating and Maintenance of-Steam Sterilizer (Autoclave (High-speed, Highpressure134C) Autoclave (Low speed, Low pressure121deg C)). Water Quality, Types of water, Types of treating waterand

Compressed Air-Operating& Maintenance (Preventive, Break down and Predictive) of gas sterilizers (ETO sterilizer, Hydrogen peroxide).

Unit III: Operating &Maintenance (Preventive, Break down and Predictive) of Ultrasonic Cleaner, Operating & Maintenance of washer disinfector. Basic electrical–Voltage,

Current, Power ,Fuse, Open circuit, Short circuit, Single Phase, Three Phase, Ground, Power factor.

Unit IV: Operating of Steam Sterilizer, Gas Sterilizer, Ultrasonic Cleaner and washer

disinfector. Measurement of Various Electrical Parameters like Voltage, Current, and power. Carry out the Electrical connection of the equipment. Trouble shooting the minor Electrical Problems. Carry out the Preventive Maintenance Schedule in Steam Sterilizer, Gas Sterilizer, Ultrasonic Cleaner and washer disinfector. Carry out the Predictive Maintenance of Steam Sterilizer, Gas Sterilizer,Ultrasonic Cleaner and washer disinfector.

Unit V:

Attend the Break down Maintenance of Steam Sterilizer, Gas Sterilizer, Ultrasonic Cleaner and washer disinfector Steam Sterilizer, Gas Sterilizer, Ultrasonic Cleaner and washer disinfector. To maintain the efficacy of the Sterilizer by using the Microbiological Report and maintain the Record. Assessment of quality of the sterilization. Checking of the water quality (used for sterilizer), Ensuring the safety (both man and materials) in the CSSD, Special precaution when using the gas sterilizers.

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

Semester-6: DSE 1 NHS-VE-6016: Nutrition and Diabetic Educator-IV

UNIT I+II=1 CREDIT, UNIT III+IV=1 CREDIT, UNIT V+VI=1 CREDIT, UNIT VII+VIII+IX=1 CREDIT

Total Marks:100
Theory (Total marks: 60/04 Credit)

Unit I: ADVANCED DIETETICS

Concept of Diet therapy : growth and source of dietetics, purpose and principles of Therapeutic diets, modification of normal diet, classification of therapeutic diets.

Role of Dietician : Definition of nutritional care, interpersonal relationship with patient, Planning and implementary dietary care, Team approach to nutritional care.

Routine hospital diets: Preoperative and postoperative diets, study and review of hospital Diet. Basic concepts and methods of -

(a) Oral feeding
(b) Tube feeding
(c) Parental nutrition
(d) Intravenous feeding.

Obesity and leanness- causes, complication and health effects, dietary treatment and other recommendation.

Unit II: Diet in fever and infections:

Types- metabolism in fever, general dietary consideration diet in influenza, typhoid fever, recurrent malaria and Tuberculosis. Diet in gastritis, peptic ulcer-symptoms, clinical findings, treatment, dietary modification, adequate nutrition, amount of food, and intervals of feeding,Chemically and mechanically irrigating foods, four stage diet (Liquid, soft, convalescent, liberalized diet).Diet in disturbances of small intestine and color.

Diarrhoea- (child and adult)- classification, modification of diet , fibre, residue. fluids& nutritional adequacy.

Unit III:

Constipation- flatulence - dietary considerations.

Ulcerative colitis (adults)- symptoms, dietary treatment.

Spruce, coeliac disease- disaccharide intolerance, dietary treatment. Diet in diseases of the liver, gall bladder and pancreas,

a) Etiology, symptoms and dietary treatment in - Jaundice, hepatitis, cirrhosis and hepaticcoma.
b) Role of alcohol in liverdiseases.
c) Dietary treatment in cholecystitis, cholelithiasis andpancreatitis

Unit-IV

Gout- Nature and occurrence of uric acid, causes, symptoms and diet. Diet in allergy and skin disturbances: Definition, classification, manifestations, common food allergies and test and dieteric treatment.

Diet in Diabetes mellitus: Hypoglycemic agent, insulin and its types. Complication of diabetes.

Diet in Renal diseases:Basic renal function, symptoms and dietary treatment in acute and chronic glomerulonephritis, Nephrosis, renal failure, dialysis. urinary calculi-causes &treatment,acid and alkali producing and neutral foods and dietary treatment.

Unit-V

Diet in Cardiovascular diseases: Role of nutrition in cardiac efficiency, incidence of Atherosclerosis, dietary principles, Hyperlipidenmia, Hypertension- causes and dietary treatment, Sodium restricted diet, level of sodium restriction, sources of sodium, danger of severe sodium restriction.

a) Incidence and predisposingfactors.
b) Symptoms-types and tests fordetection.
c) Metabolism in diabetes
d) Dietary treatment & mealmanagement

Unit V I: Practical training:

Anthropometry evaluation, Diet Analysis, Diet, Review, Diet prescription, System entries, Calorific values, Demonstration of equipments, Medical history and Medicine review, Patient education, Education questionnaire, Recipe demo.

Unit VII: Managing a Diabetes service:

The multidisciplinary team, Organizing the Diabetes clinic, Documenting and monitoring the quality of care, Assessing and reporting outcomes. Research Projects on Diabetes

Unit VIII: Insulin Delivery Devices, CGMS System & Pattern Management:

Objective,different types of Insulin Devices & their usage, benefits & drawbacks, components of CGMS,CGMS –long term & short time benefits, Newer Advances: CGMS, Pens & Pattern Management

Unit-IX: Cardiovascular Disease and CV Risk Factors:

Macro vascular Complications, T2DM andOrganSystems, Macro vascularDisease,Atherosclerosis, Coronary Heart Disease, Coronary Heart Disease in Diabetes, Controlling Risk Factors, Use of Aspirin

Practical **Total Mark: 20/1 credit**

a. Study of feeding instruments
b. Study of insulin delivery device
c. Study of dialysis instrument

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

Semester-6: DSE 1 NHS-VE-6026: Cardiac Technology-IV

UNIT I=2 CREDIT, UNIT II=1 CREDIT, UNIT III=1 CREDIT

Total Marks:100
Theory (Total marks: 60/04 Credit)

Unit I: ECHOCARDIOGRAPHY

M- mode and 2D transthoracic echocardiography,Views used in transthoracic echocardiography, Doppler echocardiography: pulsed, continuous wave and colour, Measurement of cardiac dimendions, Evaluation of systolic and diastolic left ventricular function , Regional wall motion abnormalities, Stroke volume and cardiac output assessment, Transvalvular gradients ,Orifice area ,Continuity equation, Echocardiography in Valvular heart disease: Mitral stenosis, Mitral regurgitation, Mitral valve prolapsed, Aortic stenosis, Aortic regurgitation .Infective endocarditis, Prosthetic valve assessment, Echocardiography

in Cardiomyopathies: Dilated, Hypertrophic,Restrictive, Constrictive pericarditis, Pericardial effusion and cardiac tamponade, Echocardiographic detection of congentital heart desease: Atrial septal defect Ventricular septal defect, Patent ductusarteriosus, Pulmonary stenosis , Tetralogy of Fallot .Coarctation of aorta, Left atrial thrombus, Left atroalmyxoma, Transo0esophageal echocardiography

Unit II: Cardiac catheterization laboratory basics:

Type of catheters , Catheter cleaning and packing. Techniques of sterilization-advantages and disadvantages of each, Setting up the cardiac catheterization laboratory for a diagnostic study, Table movement, Image intensifier movement Image play back, Intra cardiac pressures, Pressure recording systems , Fluid filled catheters versus catheter tipped manometers, Artifacts, damping, ventricularization

Unit III: Treadmill exercise stress testing and 24 hour ambulatory ECG (holter) recording

Exercise physiology ,Exercise protocols ,Lead systems ,Patient preparation ,ST segment displacement – types and measurement, Non-electrocardiographic observations, Exercise test indications, contra-indications and precautions, Cardiac arrhythmias and conduction disturbances during stress testing, Emergencies in the stress testing laboratory , Principles of Holter Recording Connections of the Holter recorder, Holter Analysis, Guidelines for ambulatory electrocardiography

Pressure gradient recording – pullback, peak – to peak , Cardiac output determination Thermo dilution method. Oxygen dilution method, Principles of oximetry , Shunt detection and calculations. , Coronary angiography, Coronary angiographic catheters, Use of the manifold Angiographic views in coronary angiography, Laboratory preparation for coronary angiography Left Ventriculography – catheters, views, use of the injector, Right heart catheterization and angiography

Practical **Total Mark: 20/1 credit**

a. Demonstration of Doppler echocardiography

b. Demonstration of Coronary angiography

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

Semester-6: DSE 1 NHS-VE-6036: Quality in Healthcare - Hospital Accreditation

UNIT I=1 CREDIT, UNIT II=1 CREDIT, UNIT III=2 CREDITS.

Total Marks:100
Theory (Total marks: 60/04 Credit)

UNIT I:Hospital accreditation: History of hospital accreditation in India, Background

UNIT II :NABH (**National Accreditation Board for Hospitals & Healthcare Providers**)

Schemes

UNIT III: Medical ethics and Standards: Access, Assessment and Continuity of Care,Care of Patients (COP),Management of Medication (MOM),Patient Rights and Education (PRE),Hospital Infection Control (HIC),Continual Quality Improvement (CQI),Responsibilities of Management (ROM),Facility Management and Safety (FMS),Human Resource Management (HRM),Information Management System (IMS).

Practical **Total Mark: 20/1 credit**

a. **Case study of hospital accreditation and medical ethics**
b. **Submission of report**

Internal Assessment **Total mark: 20/1 credit**

Submission of assignments, mid term examination, seminar/ presentation, attendance & group discussion

Semester-6: XXX-SE-6XX4: CSSD Technology-II

UNIT I+II=1 CREDIT, UNIT III=1 CREDIT, UNIT IV=1 CREDIT, UNIT V=1 CREDIT

Total Marks:80
Theory : Total marks: 60/04 Credit

Unit I:

Electrical Components -Resistor, Capacitor and Inductor–Basic principle, various types and package, Effect in electric alline, connection (Series circuit connection and Parallel circuit connection) Application of each items. Measurement of various electrical parameters – Voltage, Current, Power, Earth Voltage.

Unit II:

Electrical power supply-Transformer, Principle, Construction, Different typesof Transformers, Working, Various applications.Safety Regulations and Quality control – Prevention and Precaution of Electrical Shock and Electrical Fire, Hazardous in gas sterilization, checking efficacy of steam sterilizer, Maintenance of records

Unit III:

Preparation, nursing requirement, equipments including instruments,sutures,etc Anesthesia techniques, patient positing & recovery ,gynecology/obstetric surgery, urologic surgery, neurosurgery, ophthalmic surgery, plastic and reconstructive surgery, thoracic surgery, cardiac surgery, vascular surgery, organ procurement & transplantation, thyroid surgery

Unit IV:

Role of CSSD in Health Care Delivery, Planning and layout ,Microbiology and its implication with respect to CSSD ,Infection Control and Hygiene. Decontamination : Scientific Principles , Decontamination : Recommended Practices , Decontamination: Principles of Disinfection

Unit V:

Surgical Instruments : Criteria for Purchase and Maintenance ,Preparation and Supplies for Terminal Sterilization, Endoscopes and it’s Sterilization HAVC system and its impact,Water Quality and its impact in CSSD process ,Different Methods of Sterilization ,High Temperature Sterilization – Dry Heat ,Sterilization Scientific Principles ,Sterilization Sterilizer Operation Sterilization Basic Trouble Shooting Methods, Sterilization Recommended Practices for Flash Sterilization , Call back system in case of detection of failure ,Surgical Procedures

Internal Assessment **Total marks: 20/1 Credit**

Hospital Posting: 15 days
Internship/project: 3 months