SRI BALAJI VIDYAPEETH

(Deemed to be University Declared u/s 3 of UGC act 1956) Accredited by NAAC with 'A++'Grade

Pondicherry-607402.

www.sbvu.ac.in

MAHATMA GANDHI MEDICAL COLLEGE & RESEARCH INSTITUTE, PONDICHERRY

SCHOOL OF ALLIED HEALTH SCIENCES

M.Sc. CARDIAC CATHETERIZATION

2022-23 ONWARDS

CHOICE BASED CREDIT SYSTEM (CBCS)

(As approved in the Academic Council at the meeting held on 18-07-2022)

INDEX

POLICY ON COURSES OFFERED UNDER FACULTY OF ALLIED HEALTH SCIENCES

PREAMBLE

Sri Balaji Vidyapeeth, Deemed to be University, established under Section 3 of UGC Act, 1956, Accredited by NAAC with A Grade offers various courses under the Faculty of Medicine, Faculty of Dentistry, Faculty of Nursing Sciences and Faculty of Allied Health Sciences.

"Allied Health Professions are a distinct group of health professionals who apply their expertise to prevent disease transmission, diagnose, treat and rehabilitate people of all ages and all specialties. Together with a range of technical and support staff they may deliver direct patient care, rehabilitation, treatment, diagnostics and health improvement interventions to restore and maintain optimal physical, sensory, psychological, cognitive and social functions."-Organization of International Chief Health Professions Officers (ICHPO).

In March 2011, the Ministry of Health and Family Welfare nominated the Public Health Foundation of India (PHFI) as its technical partner and constituted the National Initiative for Allied Health Sciences (NIAHS) secretariat with a mandate to develop a framework to improve allied health training, education and regulation in the country.(Yet to be notified by Government of India).

Sri Balaji Vidyapeeth has introduced several innovative need based courses under the Faculty of Allied Health Sciences at Undergraduate and Postgraduate levels keeping in mind the initiative of Ministry of Health & Family Welfare, Government of India. In an era marked by expanding global job opportunities, these courses are bound to create an awareness among the students to suit themselves in the Health Care Team. Curricula have been designed in an objective manner and are aimed at cognitive, affective and psychomotor domains of learning. Furthermore all courses are designed in Choice Based Credit System (CBCS) made to suit the convenience of the students.

The Undergraduate courses mainly concentrate in creating professionals who form the part of the Health Care Team. The role of these professional is to ably assist the doctor in treatment as well as prognosis and in many a times form the core professional of the team. The proficiency and competence of the Undergraduates is fortified by the promulgation of a unique internship cum research programme.

The Postgraduate courses mainly aim at shaping a graduate into a full professional. Also these postgraduate courses help the graduates as well as the postgraduates to acquire specific skills on various adjunct therapies and techniques.

POLICY ON ELIGIBILITY, ADMISSION & COURSE DURATION OF PG COURSES

At Sri Balaji Vidyapeeth, we empower the departments of all the constituent colleges to contribute to the development of innovative, need, value based and job oriented courses taking into considerations the interests of the stakeholders.

The Post graduate courses (PG) are presently being offered under the Choice Based Credit System (CBCS) mode as per the Guidelines of UGC. The duration of the course will be two years.80 percent of attendance is mandatory for appearing at the University Examinations. The students should also complete a short duration project (in their areas of interest) and also maintain and submit a log book. The maximum time limit for completion of the course will be four years. However, the Dean / Principal, AHS has the discretionary powers to extend the course duration on valid grounds (Health, Maternity, Natural Disaster, etc.).

Eligibility for Admission

A candidate seeking admission in the M.Sc. Cardiac Catheterization Programme shall be completing the **B.Sc.(CCT) degree from any University/Institute recognized by UGC with 50% mark**

PAYMENT OF TUITION AND OTHER FEES

Every student shall pay tuition fee and other fee, as prescribed by the University, within the due date notified. The fees are subject to revision as per rules of the University. All fees, once paid to the University, will not be refunded or adjusted for any other purpose under any circumstance.

PROGRAMME OBJECTIVES:

At the end of the course the candidates must be able to:

- Acquire the knowledge and apply the concepts, theories and principles of laboratory science in their profession.
- To bring about an effective change in the laboratory practice and healthcare delivery system.
- Establish collaborative relationship with members of other disciplines.
- Demonstrate interest in continued learning and research for personal and professional advancement

CAREER PROSPECTS/PLACEMENT OPPORTUNITIES:

Academics, R&D, Healthcare setup, corporate organization, Independent practice.

SCOPE:

This post Graduate programme in Cardiac Catheterization gives an opportunity for specialized study in the field of catheterization lab for training B.Sc. (CCT) students. Candidates who successfully complete M.Sc.Cardiac Catheterization course may be placed as:

I. Specialized technologists in Cath Lab in hospitals.

II. Teachers in training institutes of cardiac care technology

III. Application Specialist in company

Other salient feature: There are only a few Universities in India offering M.Sc. Cardiac Catheterization which is an upcoming branch. Many corporate companies and R & D centres are establishing branches in India in the recent past. There is always increased demand, competition & urge to improve their own quality. Hence there is lot of scope and opportunity for those who are willing to perceive this course.

OUTLINE OF THE CHOICE BASED CREDIT SYSTEM (CBCS) FOR POSTGRADUATE DIPLOM PROGRAMME

Credit System Credit System (CBCS): The CBCS provides choice for students to select from the prescribed courses (Hard core courses(core course) and Soft core courses(elective courses).This is to enhance the quality and mobility of the students within and between the Universities in the country and abroad.

Credit hours

15 Theory classes=1 credit

30 Practical/Tutorial/Clinical training/Research project=1credit

Subjects	Credits
Each core subjects	4 Credits
Skill Enhancement course(SEC)	3 Credits
Generic Elective course(GEC)	3 Credits
Discipline Specific Electives(DSE)	3 Credits

Courses: The courses offered under this Programme of Study are represented as Hard Core courses (core course) and Soft Core courses(elective course).

a) **Hard core course (core course):** A Hard core course may be a Theory, Practical, clinical rotation/field work or Research Project Work which are compulsory component studied by candidate to complete the requirement of their programme**.**

b) **Soft Core or Elective Course:** Soft core Course may be Theory, Practical, field work, clinical rotation or Research Project Work which can be chosen from the list of courses offered by the department/CBCS under SBV/national centre for a particular programme of a study. Soft Course may be supportive to their discipline of study or providing an expanded scope or exposure to multiple disciplines of study to nurture the candidate's proficiency/skill.

i) **Discipline Specific Elective (DSE) Course:** An elective course which is supportive or related to the discipline/subject(i.e. supportive to hard core course) is called a Discipline Specific Elective (DSE) Course.

ii) **Generic Elective (GE) Course:** An elective course which is unrelated to the discipline/subject (i.e. unrelated to hard core course) to expand their knowledge chosen by a candidate is called a Generic Elective.

iii) **Skill Enhancement Courses(SEC):**This course chosen by candidate which provides additional value-based and skill-based knowledge to increase their employability.

CRITERIA FOR UNIVERSITY EXAMINATIONS ON COURSES OFFERED UNDER FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

1) **Attendance Requirements**:80% hours of learning in each Core Subjects/Electives/Practical's /clinical rotation/Postings for appearing for the university exams.
2) **Minimum marks required to be eligible for University Examination**: 50% marks in the internal assessment (Theory / Practical) are required for the candidate to be eligible to appear in the University Examinations.
3) **Passing Minimum**: 50% aggregate both in theory and practical's including internal assessment marks is required for a candidate to pass in the University Examinations.
4) **Submission of Project and Record Note Books for practical examinations**

   Candidates appearing for practical examinations should submit bonafide Record Note Books and Project prescribed for practical examinations, otherwise the candidates shall not be permitted to appear for the practical examinations.

GRADING

Marks obtained by candidate	Equivalent grade letter	Grade descriptor	Grade point
85%& above	O	Outstanding	10
75-84	A+	Excellent	9
65-74	A	Very good	8
60-64	B+	Good	7
55-59	B	Above average	6
50-54	C	Average pass	5
49& below	F	Reappear	0
	AB	Absent	0

A student obtaining **Grade F** shall be considered failed and will be required to reappear in the examination.

Conversion formula for Percentage to CGPA

Percentage divided by 9.5 =CGPA

Award of Class

Class division will be based on CGPA grade
≥7.8gradepoint=Distinction Division
≥6.8and<7.7gradepoint=First class Division
≥6.3and <6.7gradepoint=Second class Division
≥5.2and<6.2gradepoint =Third class Division
<5.2andbelow–Fail

Cumulative Grade Point Average (CGPA): It is a measure of overall cumulative performance of a student over all exams. The CGPA is the ratio of total credit points secured by a student in various courses in all exams and the sum of the total credits of all courses in all the University exams. It is expressed upto two decimal places.

Grade Point: It is a numerical weight allotted to each letter grade on a 9.5 point scale.

Transcript: Based on the credits earned, a transcript shall be issued to all the registered students after the completion of the program indicating the hours of study and structure of the curriculum delivery as prescribed in his/her curriculum and completed by the student. The transcript will display the course details, including course code, title, and number of credits, hours and type of contact hours in anon-semester.

INTERNALASSESSMENT

- Continuous Internal Assessment (CIA) for all AHS programs with a minimum of 4 Assessments per year.
- Internal Assessment will be done in each subject according to the scheme of examinations. The IA marks will be on the basis of performance in the assignment, class tests and practical test in the clinical areas.

Evaluation of Clinical Rotation

Clinical rotation/postings-To conduct practical's or viva based on the Heads of the concerned department's decision and the total 100 marks to be sent to COE through proper channel to find a place in the transcript.

Question Paper Pattern

The following question paper patterns shall be followed for CBCS pattern syllabi for the candidates admitted from the academic year 2022-23 onwards.

CORE SUBJECTS

For **POST GRADUATE DEGREE NON-SEMESTER PROGRAMME-**Each Core Subjects University Examcarries-100 marks of 80(Theory)+20(IA marks) which consists of

Theory-80 marks			
I	Short Essay questions	10(*2choice)	8x10=80

The University duration of 80 marks-3 Hours

ELECTIVE SUBJECTS

For all UG/PG/DIPLOMAN ON SEMESTER **COMPULSORY,GENERIC & DISCIPLINE** Elective University Exam papers carries-50 marks of 40(Theory)+10(IA marks)which consists of

Theory-40 marks			
I	Short Essay Questions	5(*1choice)	4x10=40

***Number of choices given**

For **SKILL BASED ELECTIVES** from 2022-23 batch onwards all UG/PG/DIPLOMA AHS courses will have 40marks as university Practical cum Viva examination &10 marks as Internal Assessment=50 marks.

50 marks of the **COMPULSORY, GENERIC, DISCIPLINE & SKILL BASED ELECITIVES** which will be converted to100 marks in the transcript.

CONDONATION FOR SHORTAGE OF ATTENDANCE

Condonation of shortage of attendance in aggregate upto10% in each Year maybe granted by thecollege Academic Committee and as per regulations of university.

RESEARCH PROJECT: Candidates should carryout individual projects only. Research Project shall be allotted at the beginning of the first year. Faculty members of the respective colleges must serve as guides and Co-guides from the other institutions may be allowed. Research Project working THREE copies have to be submitted to university 30 days before the actual schedule of the exam. Research Project report evaluation will be done and Viva-voce will be conducted by both the external and internal examiners during university practical examination for 50 marks

Components	**Marks (50)**
Research Project	30
Viva	20
Total	50

Examiners:2 Internal,2 external

External examiner should be a regular teaching faculty of any medical college with either a MD(cardiologist) or MSc.,PhD., Cardiac Catheterization and should be Associate Professor and above. Theory paper will be evaluated by both external and internal examiners. **Question paper setters:** should be a regular teaching faculty of any recognized medical college with either a MD degree or M.Sc.,PhD.,Cardiac Catheterization.

Practical Duration: Two days

Course structure and Examination scheme

FIRST YEAR M.Sc.CARDIAC CATHETERIZATION

S. No	Course Code	Category	Course Title	Hours / Non-Sem	Credit	University Marks	IA marks	Total marks
1	Hard core	Core theory- 1	Applied cardiac science, anatomy, physiology, pathology, pharmacology	60	4	80	20	100
2		Core theory- 2	Cathlab basics- Instrumentation, Radiation Safety & Basics diagnostic procedure	60	4	80	20	100
		Coretheory- 3	Epidemiology and biostatistics	60	4	80	20	100
3		CoreLab-1	Applied cardiac science – anatomy, physiology, pathology, pharmacology	60	2	80	20	100
		CoreLab-2	Cathlab basics- Instrumentation, Radiation Safety & Basics diagnostic procedure	60	2	80	20	100
4		Clinical Rotation	Clinical Rotation(Clinical Laboratory)	540	18	-	100	100
5	Soft core/elective course	Discipline specific elective course	DSEC-01-Research Methodology and biostatistics	45	3	40	10	50
6		Generic	GEC-01- Environmental Sciences					
			GEC- 02-Basics of Hospital		3	40	10	50

		elective course(to choose anyone)	Administration	45				
			GEC-03-Lifestyle disorders					
Total				930	40	480	220	700

Total Credit for one year duration=40 Credits

Course structure and Examination scheme

SECOND YEAR M.Sc.CARDIAC CATHETERIZATION

S. No	Course Code	Category	Course Title	Hours / Non-Sem	Credit	University Marks	IA marks	Total Marks
1	Hard core	Core theory paper -4	Intervention for IHD including intracoronary imaging	60	4	80	20	100
2		Core theory paper- 5	Interventions for structural heart diseases including CHD	60	4	80	20	100
		Core theory paper- 6	Interventions for cardiac failure & rhythm management	60	4	80	20	100
3		CoreLab-4	Intervention for IHD including intracoronary imaging	60	2	80	20	100
		CoreLab-5	Interventions for structural heart diseases including CHD	60	2	80	20	100
4		Clinical Rotation	Clinical Rotation (Clinical Laboratory)	240	8	-	100	100
5		Research Project		300	10	**50(30+20 viva)**	-	50
6	Soft core/elective course	Discipline specific elective course	DSEC-02- Biomedical Waste Management	45	3	40	10	50
7		Skill enhancement elective course (to choose anyone)	SEC- 01- Basic life support SEC- 02-English for clinical communication GEC- 03- Basics of yoga and practice	45	3	40	10	50
Total				930	40	530	220	750

Tota lCredit for two years duration=80 Credits

SYLLABUS

FIRST YEAR M.Sc. CARDIAC CATHETERIZATION

CORE THEORY PAPER I: Applied cardiac science, anatomy, physiology, pathology, pharmacology

S.NO	TOPICS	HOURS
1.	**APPLIED CARDIAC ANATOMY & EMBRYOLOGY** • Functional anatomy of the heart • Development of heart and blood vessels • Methods used to study cardiac anatomy, correlative anatomy, New developments and future challenges.	10 hours
2.	**CARDIAC PHYSIOLOGY** • Cardiac cycle • Physiology of coronary blood flow & its adaptation during altered physiology ▪ Oxygen supply/ demand ▪ Demand perfusion mismatch ▪ Angina ▪ Consequence of ischemia/ hypoxia. • Action potential, cardiac conduction system & physiological basics of arrhythmogenisis • Cardiac valve & its function, Normal pericardium & its function	15 hours
3.	**PATHOLOGY** • Coronary artery diseases • Rheumatic heart diseases • Congenital heart diseases • Cardiac biomarkers- (Creatinine phosphokinase CPK & myoglobin , ischemia- modified albumin, peptide, C-reactive protein, Troponin I &T) • Systemic disease involving heart(connective tissue diseases, vasculities) • Pregnancy & heart diseases • Heart muscle diseases- (Cardiomyopathy, myocarditis etc..) • Pathology of cardiac conduction system, sinus node dysfunction & complete heart block.	20 hours
4.	**CARDIAC PHARMACOLOGY (BASICS MECHANISM OF ACTION, DOSAGE & USAGE)** • Antianginal agents • Anticoagulants & Thrombolytic agents • Antiplatelet agents • Inotropes and vasopressor • Antihypertensive Drugs • Antiarrhythmic Drugs • Miscellaneous cardiac drug (e.g. Metabolic modulator)	15 hours

Reference Books:

- Manipal manual anatomy for allied health science course: sampath madhyastha
- Essentials of medical physiology : K. Sembulingam, Prema sembulingam
- Textbook of pathology : Harsh mohan
- Essentials of medical pharmacology : KD Tripathi

MODEL QUESTION PAPER

Core theory paper I:Applied cardiac science,anatomy, physiology, pathology, pharmacology

Time:3Hours **Maximum Marks:80**

Illustrate your answers with suitable diagrams wherever necessary.

Short Essay questions:(any eight)8x10=80marks

1. Write a detail note on anatomy and development of the heart with its schematic diagram?
2. Write a detail note on the methods to study the cardiac and correlative anatomy?
3. Write a detail note on pericardium and its function with its diagram?
4. Explain the cardiac action potential of SA node, AV node, ventricular muscle contraction and conduction system of the heart with its schematic diagram in detail?
5. Explain cardiac cycle and physiology of coronary blood flow in detail?
6. Define cardiomyopathy and it explain its classification, morphological feature and Pathophysiology in detail?
7. Define RHD and its clinical features, pathophysiology, signs and symptoms with its diagnostic method in detail.
8. Write a brief note on classification of congenital heart disease and explain about pathology of acyanotic Congenital heart ?
9. Explain the mechanism of action, dosage and its uses of antianginal and antiplatelets?
10. Explain the mechanism of action, dosage and its uses of antiarrythmias and Antihypertensive?

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M.Sc. CARDIAC CATHETERIZATION

Core theory paper I: Applied cardiac science , anatomy, physiology, pathology, pharmacology

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Unit No.	Unit	Marks Allotted	No. of questions
I	APPLIED CARDIAC ANATOMY & EMBRYOLOGY	**20**	**2**
II	CARDIAC PHYSIOLOGY	**20**	**2**
III	PATHOLOGY	**20**	**2**
IV	CARDIAC PHARMACOLOGY (BASICS MECHANISM OF ACTION, DOSAGE & USAGE)	**20**	**2**
	TOTAL	**80**	**8**

***Choice question can be taken from any unit**

SYLLABUS

CORE THEORY PAPER II: Cathlab basics- Instrumentation, Radiation Safety & Basics diagnostic procedure

S.NO	TOPICS	HOURS
1.	**BASICS** • Vascular access (arteries, venous) - Manual - Fluroguide - Doppler guide • Post procedure access site -Sheath removal -Closure device -Long term complication (hematoma & so on…) • Principles of cardiac instrumentation • pressure recording, ECG Machines –(12,5,3 channels) • Cardiac Monitors • Defibrillators , Oximeter • Cath-Lab Equipment • Hemodynamic recorders Ventricular assist device	20 hours
2.	**RADIATION IN CATHLAB** • Physics, effect of radiation-Including longterm effect in person working in cathlab • Radiation safety-Monitoring, assessment of radiation dose protection	10 hours
3.	**PROCEDURES** • Coronary& Peripheral angiogram • Aortogram & pulmonary angiogram • LV & RV angiogram -Pressure injector • Basics of hardware- Catheters & wires - Diagnostic vs guiding - Difference between end hole & side hole - Balloon tipped cathters - Wires(diagnostic, coronary, peripheral& special wires) - Microcathters, guide extension • Methods of coronary stenosis assessment	20 hours
4.	**CARDIAC CATH BASIC TECHNIQUE** Special cardiac catheterization Technique Complication of cardiac cath and optimal use of adjunctive pharmacology	10 hours

REFERENCES

1.Grossman's : Cardiac Catheterization & Angiography – Donald Bairn
2. TOPOL : Text book of interventional Cardiology
3. Morton Kern : Cardiac Catheterization Hand book
4. Thach N. Nguyen : Practical Tips & Tricks
5. George . D. Dangas : interventional Cardiology Principles & practice
6. MyeongKittong : Coronary imaging and physiology
7. James E. Lock: Cardiac Catheterization in Congenital Heart Disease
8. Charles E. Mullins: Cardiac Catheterization in Congenital heart Disease
9. MartonKem: interventional Physiology in Cath Lab
10. PunitRamrakha: Oxford Hand Book of Cardiology
11. KDS : Jonathan Timperley : Oxford Hand book of Pacemaker
12. Kennetn. AEllenbogen: Clinical Cardiac Pacing
13. Tom Kenny : Nuts & Bolts of Cardiac pacing
14. Lionel Opie : Drugs for the Heart

MODEL QUESTION PAPER

Core Theory paper II : Cathlab basics- Instrumentation, Radiation Safety & Basic diagnostic procedure

Max marks:80 **Duration:3Hours**

Short Essay Questions:(any eight) **(8X10=80marks)**

1. List the cathlab equipment with its features and sheath removal procedure?
2. How to manage the complications in cathlab and uses of defibrillator?
3. Write a detail note on radiation physics and safety. What are the biological effects on Radiation?
4. Enumerate the assessment of radiation dose protection and describe the part of C-ARM?
5. Difference between end hole and side hole catheter , explain balloon tipped catheter?
6. Explain about microcatheters, guide extension, guide wires?
7. How the power injection works and write a detail note on LV and RV angiogram?
8. Describe about peripheral artery disease and peripheral angioplasty?
9. Enumerate the methods of coronary stenosis assessment ?
10. Explain about the complication of cardiac cath and optimal use of adjunctive pharmacology

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M.Sc.CARDIAC CATHETERIZATION
Core Theory paper II: Cathlab basics- Instrumentation, Radiation Safety & Basics diagnostic procedure

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Unit No.	Unit	Marks Allotted	No. of questions
1.	BASICS OF CATHLAB	20	2
2.	RADIATION IN CATHLAB	20	2
3.	PROCEDURES	20	2
4.	CARDIAC CATH BASIC TECHNIQUE	20	2
	TOTAL	80	8

SYLLABUS
CORE THEORY PAPER III: Epidemiology

S.NO	TOPICS	HOURS
I	**INTRODUCTION :** Historical aspects and evolution of epidemiology, definitions and concepts in Epidemiology. Approaches in epidemiology: Descriptive , experimental and analytical epidemiology.Basic measurements in epidemiology. Study design and sampling: Sample size estimation and introduction to study design in epidemiological investigations. **FUNDAMENTALS OF EPIDEMIOLOGY** Epidemiology-Common risk factors-Tools of Epidemiology-Measures of Disease, Risk Rates, Measuring infectivity, Survey methodology including census procedures, Surveillance, outbreak investigation in public health & contact investigation.	20hours
II	**EPIDEMIOLOGY OF DISEASES OF PUBLIC HEALTH IMPORTANCE AND DISEASE CONTROL** 1. Epidemiological aspects of diseases of national importance - ARI - Diarrhea - Vaccine preventable disease - Tuberculosis - Visual impairment/blindness - Malaria - Filariasis - HIV - STD - Coronary Heart disease - Malignancy - Diabetes mellitus - Injuries - Internal - Leprosy - Hypertension - Mental Health 2. Infectious disease Epidemiology. 3. Chronic disease Epidemiology 4. Epidemiological aspects of diseases - Non-Communicable 5. Emerging and Re- Emerging Diseases 6. National Programmes related to Communicable and Non Communicable diseases 7. Dengue, Swine Flu, Chikungunya	20hours
III	**EPIDEMIOLOGICAL METHODS IN HEALTH MANAGEMENT** 1. National health programmes - Nutritional Disorders related National Health Programmes - MCH and Demographic related National Health Programmes - Advocacy 2. Monitoring and evaluation health programmes 3. Roles of Genetic and Environmental Factors in Disease Causation 4. Health Economics - Principles of Health Economics - Cost benefit, cost Effectiveness and cost utility including costing. - Efficacy effectiveness and efficiency - Evaluation needs and methods - Public health laboratory utilization of services DEMOGRAPHY: 1. Age sex distribution of population - Population pyramid - Sex ratio, dependency ratio - Factors affecting demographic profile (fertility, mortality and migration) 2. Measures of fertility - Crude birth rate, child woman ration, general Fertility rate, age specific fertility rate, total Fertility rate, gross reproduction rate, not	10hours

	Reproduction rate - Preparation of Educational materials - The role of the tutor on small group tutorials - Small group tutorials and group dynamics - Workshop organisation - Principles of learning 3. Factors affecting fertility 4. Measures of mortality - Crude death rate - Age specific death rate - SMR 5 5. Sources of demographic data - Registration of vital events - Sample surveys - Census 6. Demographic transition - Rate of natural increase - Malthusian theory - Doubling time & projections	
IV	**MEDICAL ETHICS** Historical perspectives &amp, Nuremberg Code, Declaration of Helsinki, Principle of essentiality, informed consent, confidentiality, minimisation of risk, accountability and responsibility. Ethics of clinical trials: Drug trials, vaccine trials, Clinical trials with medical devices/surgical procedures/ radioactive materials, Research in transplantation and stem cell therapy. Regulatory framework and guidelines for conduction of human research: Review processes,Institutional ethical commiuees, composition of commiuees, review procedures, WHO, UNESCO and ICMR guidelines.	10hours

REFERENCES:

Epidemiology: An Introduction. Kenneth J. J. Rothman.
Epidemiology. Leon Gordis.

MODEL QUESTION PAPER
CORE THEORY PAPPER-III Epidemiology

Time:3 hrs **MaxMarks: 80**

Short Essay questions:(any eight) **8x10 =80marks**

1. Define Epidemiology & explain in details about common risk factors in epidemiology
2. Explain Epidemiological process –basic links of spreading of infection, forms of infection occurrence, depending on intensity and existent occurrence of infectious diseases
3. A new vaccine has been produced against HIV. What are the phases in evaluation of this vaccine? How will you conduct the 2nd phase of this evaluation?
4. Write in detail about Ethics of clinical trials
4. What is sampling? Write briefly on the different sampling techniques. How can population parameters be estimated from a sample?
6. Explain the Regulatory framework and guidelines for conduction of human research?
7. Explain Epidemiological aspects of Non-Communicable diseases?
8. Write a factors affecting demographic profile (fertility, mortality and migration)?
9. Write the basic measurements in epidemiology?
10. Explain in detail about cohort study and its element?

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CORE THEORY PAPPER-III Epidemiology

BLUE PRINT

Unit No.	TOPICS	Marks Allotted	No. of questions
1	FUNDAMENTALS OF EPIDEMIOLOGY	20	2
2	EPIDEMIOLOGY OF DISEASES OF PUBLIC HEALTH IMPORTANCE AND DISEASE CONTROL	20	2
3	EPIDEMIOLOGIAL METHODS IN HEALTH MANAGEMENT	20	2
4	MEDICAL ETHICS	20	2
	TOTAL	80	8

***Choice question can be taken from any unit**

DISCIPLINE SPECIFIC ELECTIVE

SYLLABUS
DISCIPLINE SPECIFIC ELECTIVE COURSE-01
RESEARCH METHODOLOGY AND BIOSTATISTICS CREDIT 3

UNIT I **10HOURS**

Research Methodology : Meaning , objectives and types of research, research approaches, significance of research. Research and scientific methods, research process and criteria of good research Definition and identification of a research problem – Selection of research problem, Justification , theory , hypothesis ,basic assumptions, limitations and delimitations of the problems.

UNIT II **9HOURS**

Introduction of bio statistics – Meaning and its scope; Population and Sample, Parameter and Statistics; types of statistical data; Diagrammatic representation data;Mean, Median, Mode. Standard deviation.Coefficient of variation.Skewness and Kurtosis. Probability – Definition, Axioms of Probability; addition and Multiplication theorem.

UNIT III **9HOURS**

Concept of correlation– Simple, Partial regression-Simple Methods of Association– Chisquare test oafssociation of attributes,Goodness of fit.

UNIT IV **10HOURS**

Concept of Hypothesis – Null, Alternative Hypothesis. Type I and type II errors. Sampling distribution Standard error t & F distribution; t test based on single samples, two sample mean. Paired samples, F test two sample variances f test for several mean (one way ANOVA only). Z – test for proportion – one sample, two sample, MS –excel support for above expression.

UNIT V **10HOURS**

Framing proposal for acquiring grants: the question to be addressed – rationale and importance of the question being addressed – Empirical and theoretical framework –Presenting pilot study / data or background information – Research proposal and timeframe- Specificity of methodology- Organization of different phases of study- Expected outcome of study and its implications – Budgeting – Available infrastructure and resources–Executive summary

Textbooks and Reference materials

1. Bandarkar,P.LandWilkinsonT.S(2000):Methodology and Techniques of social Research, Himalaya Publishing House,Mumbai.

2. Copper,H.M.(2002) Integrating research:A guide for literature review(2nd Edition) California;Sage

ENVIRONMENTAL SCIENCE

NAME OF THE SUBJECT PAPER	**:ENVIRONMENTAL SCIENCE**
DURATION OF THEORY CLASSES	**:45 hrs**
EXAMINATION	**:(40 U+10 IA)**
DURATION OF THEORY EXAMINATION	**:1 ½hrs**

UNIT-I (Renewable and Non—renewable resources**)**
The multidisciplinary nature of environmental studies—Definition, scope and importance—Need for public awareness.

1 Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
2 Water resources: Use and over-utilization of surface and groundwater, floods, drought, conflicts over water, dams-benefits and problems.
3 Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
4 Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, waterlogging, salinity, case studies.
5 Energy resources: Growing energy needs, renewable and non-Renewable energy resources, use of alternate energy sources, case studies.
6 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-II (Ecosystems)

Concept of an ecosystem-Structure and function of an ecosystem Producers,consumers and decomposers — Energy flow in the ecosystem-Ecological succession-Food chains, food webs and ecological pyramids — Introduction, types, characteristic features, structure and function of the following ecosystem:

- Forest ecosystem
- Grassland ecosystem
- Desert ecosystem
- Aquatic ecosystems(Ponds, streams, lakes, rivers, oceanestuaries)

UNIT-III (Biodiversity and its conservation)

Introduction—Definition: genetics, species and ecosystem diversity

- Biogeographically classification of India
- ValueofBiodiversity:Consumptiveuse,productiveuse,social,ethicalaesthetic and option values
- Biodiversity at global, national and local levels
- 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 of biodiversity

UNIT-IV (Environmental Pollution)

Definition-causes, effects and control measures of:

- Air pollution
- Water pollution
- Soil pollution
- Marine pollution
- Noise pollution
- Thermal pollution
- Nuclear pollution
- Solid waste Management: causes, effects and control measures of urban and industrial wastes — role of an individual in prevention of pollution —Pollution case studies — Disaster management: floods, earthquake, cyclone and landslides.

UNIT-V

Social Issues and the Environment: From unsustainable to sustainable development —Urban problems and 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 change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

- 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 environmental legislation —Public awareness
- Human Population and the Environment: Population growth, variation among nations — Population explosion — Family welfare Programmes —Environment and human health- Human Rights - Value Education- HIV/ AIDS - Women and Child Welfare-Role of InformationTechnology in Environment and Human Health—Case Studies.

FIELDWORK

1. Visit to local area to document environmental assets-river/forest/grassland/hill /mountain
2. Visit to a local polluted site -Urban/Rural/Industrial/Agricultural
3. Study of common plants, insects, birds
4. Study of simple ecosystems-pond, river, hill slopes, etc.

TEXTBOOKSRECOMMENDED

1. Agarwal,K.C. Environmental Science,Nidi Publishers.
2. BharuchaErach,The Biodiversity of India, Map in Publication.
3. BrunnerRC, Hazardous waste incineration, McGraw Hill Publishers.
4. Iaclhav H, Environmental Protection and Laws, Himalaya Publication.
5. OdumEP,fundamentals of Ecology,WB Sannders Publication.

TEACHING LEARNING ACTIVITIES

The course content in Environmental Studies will be covered by:

1. Interactive Lectures
2. Group Discussions
3. Field Visits

GENERIC ELECTRIVE COURSE-02

Basics of Hospital Administration

NAME OF THE SUBJECT PAPER : Basics of Hospital Administration

DURATION OF THEORY CLASSES :45 Hrs.

EXAMINATION :50 Marks(40U+10IA)

DURATION OF THEORY EXAMINATION :1½ Hrs.

COURSE OBJECTIVES

- To provide orientation about the hospital functions
- To familiarize students with the basics concepts of hospital management

UNIT:I ORGANISATION OF A HOSPITAL AND ITS DEPARTMENTS

1. Organogram
2. Vision, Mission & Values, Logo
3. Patient Service Points–Clinical & Non- Clinical(OPD's, A & E, MHC, Wards, ICU's, OT's, etc.)
4. Scope of Services(Medical & Supportive Services

UNIT:II HOSPITAL POLICIES & PROCEDURES

1. Registration Process
2. OP/IP Billing
3. Admission Process
4. Discharge Process
5. Financial counseling
6. Visitors Policy
7. Feedback forms.

UNIT:III MEDICAL RECORDS MANAGEMENT/LEGAL ASPECTS

1.Types of Medico legal cases
2. SOP's for handling MLC
3. Medical Records-Forms, consents, registers used in hospitals

UNIT:IV QUALITY MANAGEMENT

1. Quality-Brief Introduction
2. Code of Conduct for health care professionals
3. Patient rights & responsibilities
4. Incident Reporting
5. Quality Indicators
6. List of Licenses to be obtained to run a Hospital College
7. Accreditation–ISO/NABH/JCI

UNIT:V OCCUPATIONAL SAFETY

1. Biomedical Waste Management
2. Hospital Spill Management
3. Usage of PPE
4. Emergency Codes
5. Fire Safety Management
6. Hospital Infection Control

UNIT:VI ORGANISATIONAL BEHAVIOUR

1. Communication with patients/healthcare professionals
2. Grooming standards
3. Time Management
4. Grievance Handling, Interdisciplinary Committee
5. Leadership

LEARNINGOUTCOMES

Students will have an overview of hospital functions, processes and patient management.

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GENERIC ELECTIVE-03
Lifestyle Disorders

NAME OF THE SUBJECT PAPER :Lifestyle Disorders
DURATION OF THEORY CLASSES :45Hrs.
EXAMINATION :50 Marks(40U+10IA)
DURATION OF THEORY EXAMINATION :1½Hrs.

THEORY(45Hours)

UNIT I Modern Lifestyle disorders

Deskbound and sleeping habits, junk food, anxiety. Food poisoning, Acidity.

UNIT II Dietary disorders

Food groups and concept of a balanced diet, obesity, metabolic syndrome, hypertension- their causes and prevention through dietary and lifestyle modifications

UNIT III Social health problems

Smoking, alcoholism, drug dependence and Aquired Immuno Deficiency Syndorme(AIDS).

UNIT IV Gastrointestinal disorders

Stomach disorders-Gastritis, Ulcer, Amoebiasis, Constipation, piles

Common ailment- cold, cough, fevers, diarrhoea, constipation- their causes and dietary treatment

Learning outcomes:

To understand the relevance, significance and implications of lifestyle disorders for the betterment of human life quality

Text Books

1. Textbook of Clinical Biochemistry-Carl.A.Burtis and Edward R.Ashwood
2. TextBook of Medical Biochemistry –Dr.M.N.Chatterjee and RaneShinde

Reference Books

1. P.SinghMD.Textbook of Nutrition and Health;FirstEd;2008;Academic Excellence
2. Biochemistry with Clinical Correlation-Thomas M.Devli

SYLLABUS

SECOND YEAR M.Sc CARDIAC CATHETERIZATION

CORE THEORY PAPER-IV Intervention for IHD including intracoronary imaging

S.NO	TOPICS	HOURS
1.	**HISTORY OF PCI** PCI POBA- Advantage & disadvantage Application of POBA in this era Different stenting **CORONARY ANGIOPLASTY** Additional device during PCI -Debulking device, EPD, thrombectomy, Rotational ablation catheters, Directional coronary atherectomy ,Thrombus aspiration system , Cutting balloons.	15 hours
2.	**PCI IN DIFFERENT SITUATION** - Side branch and bifurcation stenosis and approach -Multivessel PCI -Ostial PCI -Bifurcation PCI -LM PCI -PCI with calcium -PCI with thrombus -CTO -PCI for bypass graft	20 hours
3.	**HIGH RISK PCI -IDENTIFYING THE HIGH RISK PCI PATIENT** • ACC/AHA lesion classification Patient related and clinical risk factors • Risk reduction and support of the high risk PCI - IABP - Impella - ECMO • Management of complication. • PCI for cardiogenic shock	15 hours
4.	**INTRACORONARY IMAGING TECHNICS** -IVUS(Intravascular ultrasound) -OCT (Optical coherence tomography) -FFR(Fractional flow reserve) -Coronary directed thrombus- for acute DVT/acute limb ischemia - Angiojet	10 hours

REFERENCES:

1.Grossman's : Cardiac Catheterization & Angiography – Donald Bairn
2. TOPOL : Text book of interventional Cardiology
3. Morton Kern : Cardiac Catheterization Hand book
4. Thach N. Nguyen : Practical Tips & Tricks
5. George . D. Dangas : interventional Cardiology Principles & practice
6. MyeongKittong : Coronary imaging and physiology
7. James E. Lock: Cardiac Catheterization in Congenital Heart Disease
8. Charles E. Mullins: Cardiac Catheterization in Congenital heart Disease
9. MartonKem: interventional Physiology in Cath Lab
10. PunitRamrakha: Oxford Hand Book of Cardiology
11. KDS : Jonathan Timperley : Oxford Hand book of Pacemaker
12. Kennetn. AEllenbogen: Clinical Cardiac Pacing
13. Tom Kenny : Nuts & Bolts of Cardiac pacing
14. Lionel Opie : Drugs for the Heart

MODELQUESTIONPAPER

CORE THEORY PAPER-IV Intervention for IHD including intracoronary imaging

Time:3hrs **MaxMarks:80**

Short Essay questions:(any eight) **8x10=80marks**

1. Explain about athrectomy and thromectomy?
2. What are the advantages and disadvantages of POBA and cutting balloon?
3. How to approach the side branch and bifurcation percutaneous coronary intervention?
4. Explain chronic total occlusion, list the CTO guidewires, techniques and management?
5. Define IABP, indication, contraindication, techniques and complications?
6. Explain the device insertion and initiation of support while using impella and its indication?
7. Write a detail note on ECMO with its principle, components and complications?
8. Explain the imaging system, clinical application and image interpretation of IVUS?
9. Describe about imaging systems, image acquisition procedures, interpretation, safety and limitations of OCT?
10. What is FFR, physiological assessment of coronary artery stenosis, technique and limitations?

SRI BALAJI VIDYAPEETH

(Deemed University)

Accredited by NAAC with A++ Grade

CORE THEORY PAPER-IV Intervention for IHD including intracoronary imaging

BLUEPRINT

Unit No.	TOPICS	MARKS ALLOTED	No. of questions
1	CORONARY ANGIOPLASTY	**20**	**2**
2	PCI IN DIFFERENT SITUATION	**20**	**2**
3	HIGH RISK PCI- IDENTIFYING THE HIGH RISK PCI PATIENT	**20**	**2**
4	INTRACORONARY IMAGING TECHNICS	**20**	**2**
		80	**8**

***Choice question can be taken from any unit**

SYLLABUS

CORE THEORY PAPER- VI NTERVENTIONS FOR STRUCTURAL HEART DISEASES INCLUDING CHD

S.NO	TOPICS	HOURS
1.	Diagnosis , Principles & Treatment of congenital heart diseases **(LEFT TO RIGHT SHUNT)** • ASD, VSD, PDA, Pulmonic stenosis, Aortic stenosis, Atrio-ventricular valve malformation, Tricuspid dysplasia &Coarctation of aorta (clinical findings, diagnosis, treatment) **CHD- (RIGHT TO LEFT SHUNT)** • TOF,(ASD, VSD, PDA with pulmonary hypertension)	20 hours
2.	**ADVANCED PROCEDURE** ➢ Treatment for TGA - Arterial Switch -Atrial Switch ➢ LAA Closure ➢ TAVI, Mitral clip ➢ Bentall procedure ➢ Pre closure device - Angioseal	15 hours
3.	**APPROACH TO THE PAEDIATRIC CATH** Paediatric interventions Intra cardiac shunt lesions Extracardiac shunts	10 hours
4.	**PROCEDURE** Percutaneous Mitral Valve Repair Percutaneous Aortic valvular approach Pulmonary and Tricuspid valve implantation Percutaneous Ballonpericardiotomy for patient with Pericardial effusion and tamponade	15 hours

REFERENCES:

1.Grossman's : Cardiac Catheterization & Angiography – Donald Bairn
2. TOPOL : Text book of interventional Cardiology
3. Morton Kern : Cardiac Catheterization Hand book
4. Thach N. Nguyen : Practical Tips & Tricks
5. George . D. Dangas : interventional Cardiology Principles & practice
6. MyeongKittong : Coronary imaging and physiology
7. James E. Lock: Cardiac Catheterization in Congenital Heart Disease
8. Charles E. Mullins: Cardiac Catheterization in Congenital heart Disease
9. MartonKem: interventional Physiology in Cath Lab
10. PunitRamrakha: Oxford Hand Book of Cardiology
11. KDS : Jonathan Timperley : Oxford Hand book of Pacemaker
12. Kennetn. AEllenbogen: Clinical Cardiac Pacing
13. Tom Kenny : Nuts & Bolts of Cardiac pacing
14. Lionel Opie : Drugs for the Heart

MODEL QUESTION PAPER

CORE THEORY PAPER- V INTERVENTIONS FOR STRUCTURAL HEART DISEASES INCLUDING CHD

Time:3hrs **MaxMarks:80**

Short Essay questions:(any eight) **8x10=80marks**

1. Explain pulmonary hypertension with ASD condition & techniques used for ASD device closure?
2. Enumerate the four condition of TOF with procedure?
3. Explain the types of left atrial appendage device closure and list 3 types of device with diagram?
4. Enumerate the symptoms, causes, risk factor, complications and procedure of coarctation of aorta?
5. Define the Signs, symptoms & Management strategies in pericardial emergencies?
6. List out the indication, contraindication, device closure management and complications of ASD?
7. Brief about the procedures of tricuspid valve implantation and repair?
8. Define PDA, indication, contraindication, device closure, management and complications?
9. Enumerate the indication, contraindication, procedure and complication of transcatheter aortic valve implantation?
10. Explain about the bentall procedure, indication, management and complication ?

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CORE THEORY PAPER-V INTERVENTIONS FOR STRUCTURAL HEART DISEASES INCLUDING CHD

BLUEPRINT

Unit No.	TOPICS	MARKS ALLOTED	No. of questions
1	Principles & Treatment of congenital heart diseases	20	2
2	ADVANCED PROCEDURE	20	2
3	APPROACH TO THE PAEDIATRIC CATH	20	2
4	CATH PROCEDURE	20	2
Total		80	8

***Choice question can be taken from any unit**

SYLLABUS
CORE THEORY PAPER-VI INTERVENTIONS FOR CARDIAC FAILURE & RHYTHM MANAGEMENTS

S.NO	TOPICS	HOURS
1.	**CARDIAC RHYTHM** ➢ Mechanism of contraction & relaxation. ➢ Mechanisms, diagnosis &Management of cardiac arrhythmias ➢ Special problems in cardiac pacing like (a) pacemaker syndrome; (b) temporary cardiac pacing; (c) diagnostic and surgical procedures in pacemaker patients; (d) pacemaker lead extraction; (e) biventricular pacing for congestive heart failure. ➢ Troubleshooting in pacemaker ICD	20 hours
2.	**HEART FAILURE** ➢ Pathophysiology of heart failure (systolic & diastolic failure) ➢ Emerging management & therapies of heart failure	15 hours
3.	**IMPLANTABLE DEVICE FOR HEART FAILURE AND CARDIAC ARRHYTHMIAS ETC..** ➢ Cardiac pacemaker ➢ Cardioverter- defibrillator ➢ Ablation procedure	15 hours
4.	Guideline for pacemaker, ICD & CRT Troubleshoot in pacemaker & ICD	10 hours

REFERENCE BOOKS:

1.Grossman's : Cardiac Catheterization & Angiography – Donald Bairn
2. TOPOL : Text book of interventional Cardiology
3. Morton Kern : Cardiac Catheterization Hand book
4. Thach N. Nguyen : Practical Tips & Tricks
5. George . D. Dangas : interventional Cardiology Principles & practice
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8. Charles E. Mullins: Cardiac Catheterization in Congenital heart Disease
9. MartonKem: interventional Physiology in Cath Lab
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11. KDS : Jonathan Timperley : Oxford Hand book of Pacemaker
12. Kennetn. AEllenbogen: Clinical Cardiac Pacing
13. Tom Kenny : Nuts & Bolts of Cardiac pacing
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(Deemed University)

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CORE THEORY PAPER-VI INTERVENTIONS FOR CARDIAC FAILURE & RHYTHM MANAGEMENTS

BLUEPRINT

Unit No.	Unit	Marks allotted	No. of questions
1	CARDIAC RHYTHM	20	2
2	HEART FAILURE	20	2
3	IMPLANTABLE DEVICE FOR HEART FAILURE AND CARDIAC ARRHYTHMIAS ETC..	20	2
4	Guideline for pacemaker, ICD & CRT Troubleshoot in pacemaker & ICD	20	2
	TOTAL	80	8

***Choice question can be taken from any unit**

MODELQUESTIONPAPER

CORE THEORY PAPER- VI INTERVENTIONS FOR CARDIAC FAILURE & RHYTHM MANAGEMENTS

Time:3hrs **8 x 10 = 80 marks**

Short Essay questions:(any eight)

1. Brief in detail about mechanism of contraction and relaxation Action potential of SA node, AV node, Ventricular contraction?
2. Explain the pathophysiology and its classification of heart failure**?**
3. Enumerate the modes and complication of pacemaker?
4. Describe about pacemaker indication, contraindications and procedure in detail?
5. Explain about Cardioverter- defibrillator - types, uses, principle, procedure and complication?
6. Guideline for pacemaker, ICD and CRT in detail?
7. Define CRT , uses, indication, techniques, management and complications?
8. Explain the pre and post procedure of ablation procedure and its complications?
9. Describe about the Emerging management and therapies of heart failure?
10. Describe in detail about mechanism involve in arrhythmias – enhanced automatically, triggered automaticity and re entry tachycardia?

SYLLABUS

DISCIPLINE SPECIFIC ELECTIVECOURSE- 02

BIOMEDICAL WASTE MANAGEMENT

UNIT I: Introduction to hospital waste

- Definition classification of hospital wastes.
- Types and composition: Types of solids, liquids, sharps, blood and blood tissue, radioactive material, biological and chemical material.
- Hospital effluents: Nature and composition, Levels if generation in a small clinic nursing home, small and large hospital, storage of hospital waste; Types of bags and containers used for usage.

UNIT II: Biomedical Waste Management Guideline

- Requirement
- Documentation of Biomedical waste types and guidelines
- Biomedical wastes (Management & Handling) Rules,1998; and amendments.

UNIT III: Principles of Biomedical Waste Management

- Segregation of biomedical waste.
- Handling and transport of hospital waste; Authorization and accidental spilling
- Methods/treatments required for disposal of pathogens
- Waste disposal methods
- Techniques of waste management
- Protocols of HW management

UNIT IV: Waste prevention

- Waste reduction activities
- Waste recycling,

UNITV: Biomedical Waste Treatment facility

- Introduction, location, land requirements,
- Coverage area, types of equipment
- Infrastructure requirements,
- Record keeping,
- Waste collection,transport and storage facilities,precautions required.

TextBooks:

1.Sustainable Biomedical Waste Management,P.K.Behera,2nd Edition.2008.

2.Biomedical Waste Management,R.RadhaKrishnan,1st edition,2005

3.The environmental Protection Act,1986

SKILL ENHANCEMENT ELECTIVE COURSE

SKILL BASED ELECTIVE COURSES-II YEAR
SEC-03 Basics of Yoga and Practice

NAME OF THE SUBJECT PAPER : Basics of Yoga and Practice

DURATION OF THEORY CLASSES : 45Hrs.

EXAMINATION : 50 Marks (40 U + 10IA)

DURATION OF THEORY EXAMINATION :1½Hrs.

Unit	TIME(HRS)	CONTENT
1	1	Introduction toYoga philosophy,psychology and lifestyle
2	1	A brief outline of the history of Yoga.
3	1	Cultivation of correct psychological attitudes
4	1	Asanas:Definition,Types,scope and limitations of Asanas
5	1	Pranayamas and their significance inYogic curriculum,Types & phases of Pranayama.
6	1	Dharna and Dhyanaas the keys to unlocking human potential.
7	1	Study of various aspects of Yoga: Kriyas, Bandhas, Mudras
8	1	Yoga definedas— Integration and—Harmony
9	1	Meaning of the term—Positive Health
10	1	Yoga,a tool to restore homeostasis
11	1	Integration of Yoga into Health Professions Education
12	1	Order of teaching theYogic practices;Do's and Dont's of specificYoga techniques.
13	2	Applied aspects of Yoga in various human activities like therapeutics,education and sports
14	2	Introduction to yogic concept of health and disease

Unit 15: Introduction to Yogic techniques: Methods and practices (32hours)

Asanas(26hrs):

- Aruna Surya Namaskar
- Ardha –Padmasana/Padmasana
- Ardhakati Chakrasana
- Pada Hasta
- Pavana Muktasana
- Trikona
- Navasana
- Ardha–Shalabhasana
- Shalabhasana
- Makarasana
- Bhujangasana
- Dhanurasana
- Vakrasana
- Vrikshasana
- Ushtrasana
- Gomukasana
- YogaMudra.
- Natarajasana
- Chakrasana
- Sarvangasana
- Matsyasana
- Halasana
- Shavasana

Pranayama (6hrs)

- Vibhaga Pranayama
- Pranava Pranayama
- Savitri Pranayama
- Chandra and SuryaNadi Pranayama
- Nadi–Shuddhi
- Sheetali and Sitkari

PRESCRIBED TEXTBOOKS

- Dayanidy G and Bhavanani AB.CYTER Practical Book.Pondicherry,India:Dhivyan and a Creations; 2016.
- A primer of Yoga Theory–Dr Ananda Balayogi Bhavanani,Dhivyan and a Creations,Pondicherry-13
- Fundamentals of Yoga History-Compilation by MeenaRamanathan
- Basic Hatha Yoga lessons (Tamil)-Dr Ananda Balayogi and Meena Ramanathan,Puducherry

BOOKS RECOMMENDED FOR STUDIES AND REFERENCE

1. A yogic approach to stress-Dr Ananda BalayogiBhavanani,AnandaAshram,Pondicherry
2. Asana,Pranayama,Mudra and Bandha.Swami Satyananda,Bihar School of Yoga,Monger
3. ASANAS:WHY? AND HOW?–by Shri.O.P.Tiwari.Kaivalyadhama,Lonavla.
4. Hatha Yoga practices of the Gitananda tradition by Dr Ananda BalayogiBhavanani
5. RamanathanMeena.Applied Yoga:Applications of Yoga in Different Fields of Human Activities.3rdEd;Pondicherry, India:Sri Balaji Vidyapeeth;2018
6. PRANAYAMA–by Swami Kuvalayan and a.Kaivalyadhama,Lonavla.
7. Yoga and sports-SwamiGitananda and MeenakshiDevi,Ananda Ashram,Pondicherry

SEC 02: ENGLISH

NAME OF THE SUBJECT PAPER :ENGLISH

DURATION OF THEORY CLASSES :16hrs

DURATION OF PRACTICAL SESSIONS :34hrs

EXAMINATION : 100 marks (80 U + 20 IA)

NO UNIVERSITY PRACTICAL EXAMINATION

DURATION OF THEORY EXAMINATION : 1 ½ hrs

YEAR IN WHICH THE SUBJECT PAPER IS TAUGHT :I YEAR

SYLLABUS

(THEORY & PRACTICALS=16+34Hours)

COURSE DESCRIPTION: This course is designed to build spoken and written English competency of the students needed to function effectively in academic setup.
OBJECTIVES: On completion of this subject, the student will be able to:
1. Speak and write grammatically correct sentences in English.
2. Develop effective writing skills.
3. Build fluency in English

UNIT:I GRAMMAR

1. Remedial Grammar: Parts of speech; Types of sentences, question tags
2. Modal verbs;
3. Tenses
4. Concordance

UNIT:II VOCABULARY

1. Word formation–prefixes and suffixes
2. Medical terminology
3. Words often misused or confused
4. Idioms and phrases

UNIT:III WRITING SKILLS

1. Letter writing- permission, leave and other official letters
2. Note making methods
3. Jumbled sentences-cohesion
4. Paragraph Writing

UNIT:IV SPOKEN COMMUNICATION

1. Pronunciation of commonly mispronounced words
2. Day to day conversation
3. Telephonic conversations
4. Group Discussions

UNIT:V LISTENING AND READING SKILLS

1.General Listening and reading comprehension

Textbook Recommended

1.Effective English Communication by KrishnaMohan and MeenakshiRaman,TataMc Graw-Hill Publishing Company Limited,New Delhi.

2.English for Colleges and Competitive Exams by Dr.R.Dyvadatham,Emerald Publishers