LESSON PLAN COMPILATION FOR GNM FIRST YEAR COURSE

Vol III : Bio-Sciences

PART I

- Micro-Biology
- Anatomy & Physiology

2016

DRAFT MESSAGE

HM

मुझे यह जानकर अत्यधिक प्रसन्नता हो रही है कि प्री सर्विस नर्सिंग एजुकेशन कार्यक्रम के अंतर्गत एएनएम तथा जीएनएम प्रथम वर्ष पाठ्यक्रमों के लेसन प्लान तैयार किए जा चुके है। मुझे लगता है कि प्री सर्विस नर्सिंग एजुकेशन की प्रणालियों के सशक्तीकरण की दिशा में यह एक महत्वपूर्ण कदम है। लेसन प्लान फैकल्टी को योजनाबद्ध तरीके से सभी बिंदुओ को सम्मिलित करते हुए अपना अध्यापन करने में सहायक होगा।

इस कार्य को पूरा करने में हमारे संस्थानों को फैकल्टी की मेहनत एवं जपाइगो का तकनीकी सहयोग सराहनीय रहा है। साथ ही में एनएचएम को इस पहल को अपने सतत प्रयासों से इतने कम समय में परिकल्पित कर चरितार्थ करने पर बधाई देता हूँ।

मैं उम्मीद करता हूँ कि लेसन प्लान फैकल्टी को व्यवस्थित रूप से अपना पाठ्यक्रम पूरा करने में सहायक होंगे।

DRAFT MESSAGE

PHS

राज्य सरकार प्री सर्विस नर्सिंग एजुकेशन को सुदृढ़ करने के लिए अनके प्रयास कर रही है। शिक्षण प्रणालियों को व्यवस्थित एवं सशक्त करना अनिवार्य है। अब सभी एएनएम तथा जीएनएम स्कूलों में प्रभावी शिक्षण हेतु कम्प्यूटर एवं प्रोजेक्टर की व्यवस्था उपलब्ध करा दी गई है। अब हमें शिक्षण प्रणाली पर ध्यान केन्द्रित करना होगा, जिससे छात्रों को प्रभावी रूप से ज्ञानर्जन प्राप्त हो सके।

पाठ्यक्रम के अनुसार चिंहित सभी विषयवस्तुओं के लेसन प्लान व्यवस्थित रूप से तैयार करना इस दिशा में एक महत्वपूर्ण उपलब्धि है।

मैं इस पहल के लिए एनएचएम, जपाइगो तथा हमारे एएनएम तथा जीएनएम स्कूलों की समस्त फैकल्टी को बधाई देती हूँ।

मुझे विश्वास है कि हमारी सभी फैकल्टी लेसन प्लान का नियमित उपयोग कर शिक्षण को व्यवहारिक और प्रभावी बना सकेंगे।

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Subject: Bio Sciences

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List of Abbreviations and Expansions

ADR	Adverse Drug Reaction
AV	Audio Visual
CHN	Community Health Nurse
COPD	Chronic Obstructive Pulmonary Disease
DDC	Drug Distribution Centre
DOTS	Directly Observed Treatment Short course
FTD	Fever Treatment Depot
G6PD	Glucose 6 Phosphate Dehydrogenase
GNM	General Nursing and Midwifery
ICN	International Council of Nurses
IM	Intra Muscular
IMR	Infant Mortality Rate
IQ	Intelligence Quotient
IRS	Insecticide Residual Spray
IV	Intravenous
L	Listener
MDGs	Millennium Development Goals Maternal
MMR	Mortality Ratio
NSAID	Non-Steroidal Anti-inflammatory Drugs
OHP	Overhead Projector
OTC	Over The Counter
PPT	PowerPoint
Q	Question
S	Student
SC	Subcutaneous
T	Teacher
UNICEF	United Nations Children's Fund
WHO	World Health Organization

LESSON PLAN

Subject : Microbiology

Unit : I

Topic : **Introduction & history of microbiology**

Group : GNM I st year

Place : CLASS ROOM

Date & time : ……..

Teaching methods : Lecture cum discussion.

AV aids : Black Board and chalk, LCD, Computer

Students Pre requisite : The students should be able to introduce and describe the history of microbiology.

General Objectives : At the end of the class the students will be able to gain knowledge regarding the definition, meaning and introduction and history of microbiology.

Specific Objectives **:** At the end of the class the students will be able to

1. Define the microbiology.
2. To explain the meaning of microbiology.
3. To introduce the microbiology.
4. To describe the branches of microbiology.
5. To explain the terminology related to microbiology.
6. To describe history of microbiology.
7. To describe main discoveries in microbiology.

Review of previous class :

- Define pasteurization
- Define fermentation

Introduction:

Microbiology is the science of living organism that are only visible under the microscope. Medical microbiology deals with the causative agents of infectious diseases of man, his reaction to such infections, the ways in which they produce disease and the methods for their diagnosis.

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
1.	2min	Define the microbiology.	**Definition** - The study of microbiology is the study of micro-organisms, which are organisms that are invisible to the naked eye.	T: explains with power presentation. S: listens and take notes.	Q;Define microbiology
2.	2min	To explain the meaning of microbiology.	Microbiology word is derived from Greek word micros means "small", bios means "life"; and logia means study, so it is the study of microscopic organisms, those being unicellular (single cell), multicellular (cell colony),or a cellular (lacking cells).	T: explains with power presentation. S: listens and take notes.	Q;Explain the meaning of microbiology.
3.	6min	To introduce the microbiology.	A Microbiology encompasses numerous sub-disciplines	T: explains with power presentation.	Q;Explain the microbiology.

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			including virology, mycology, parasitology and bacteriology. Eukaryotic micro organisms possess membrane bound cell organelles and include fungi and protists, whereas prokaryotic organisms—all of which are micro organisms—are conventionally classified as lacking membrane-bound organelles and include eubacteria and archaebacteria. Microbiologists traditionally relied on culture, staining, and microscopy. However, less than 1% of the micro organisms present in common environments can be cultured in isolation using current means. Microbiologists often rely on extraction or detection of nucleic acid, either	S: listens and take notes.	

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			DNA or RNA sequences. Viruses have been variably classified as organisms, as they have been considered either as very simple micro organisms or very complex molecules. Prions, never considered micro organisms, have been investigated by virologists, however, as the clinical effects traced to them were originally presumed due to chronic viral infections, and virologists took search—discovering "infectious proteins". As an application of microbiology, medical microbiology is often introduced with medical principles of immunology as microbiology and immunology Otherwise, microbiology, virology, and immunology as basic sciences have greatly		

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			exceeded the medical variants, applied sciences.		
4.	5min	To describe the branches of microbiology.	Branches The branches of microbiology can be classified into pure and applied sciences. Microbiology can be also classified based on taxonomy, in the cases of bacteriology, mycology, protozoology, and phycology. There is considerable overlap between the specific branches of microbiology with each other and with other disciplines, and certain aspects of these branches can extend beyond the traditional scope of microbiology.	T: explains with power presentation. S: listens and take notes.	Q;Explain the branches of microbiology.

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
5.	15min	To explain the terminology related to microbiology.	***Terminology*** • Bacteriology: The study of bacteria. • Mycology: The study of fungi. • Protozoology: The study of protozoa. • Phycology/algology: The study of algae. • Parasitology: The study of parasites. • Immunology: The study of the immune system. • Virology: The study of viruses. • Nematology: The study of nematodes. • Microbial cytology: The study of microscopic and sub microscopic details of microorganisms. • Microbial physiology: The study of how the	T: explains with power presentation. S: listens and take notes.	Q;Explain the terminology related to microbiology.

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			microbial cell functions bio chemically. Includes the study of microbial growth, microbial metabolism and microbial cell structure. • Microbial ecology: The relationship between microorganisms and their environment. • Microbial genetics: The study of how genes are organized and regulated in microbes in relation to their cellular functions. Closely related to the field of molecular biology. • Cellular microbiology: A discipline bridging microbiology and cell biology. • Evolutionary microbiology: The study of the evolution of microbes. This field can be		

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			subdivided into: • Microbial taxonomy: The naming and classification of micro organisms. • Microbial systematic: The study of the diversity and genetic relationship of micro organisms. • Generation microbiology: The study of those micro organisms that have the same characters as their parents. • Systems microbiology: A discipline bridging systems biology and microbiology. • Molecular microbiology: The study of the molecular principles of the physiological processes in microorganisms. ***Other:***		

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			• Nano microbiology: The study of those organisms on nano level. • Exo microbiology (or Astro microbiology): The study of microorganisms in outer space (see: List of microorganisms tested in outer space) • Biological agent: The study of those microorganisms which are being used in weapon industries. • Predictive microbiology: The quantification of relations between controlling factors in foods and responses of pathogenic and spoilage micro organisms using mathematical modelling		

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
6.	15min	To describe history of microbiology.	**History** **Ancient** The existence of micro organisms was hypothesized for many centuries before their actual discovery. The existence of unseen microbiological life was postulated by Jainism which is based on Mahavira's teachings as early as 6th century BCE. Paul Dundas notes that Mahavira asserted existence of unseen microbiological creatures living in earth, water, air and fire. Jain scriptures also	T: explains with power presentation S: listens and takes notes	Q;Explain history of microbiology.

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			describe nigodas which are sub-microscopic creatures living in large clusters and having a very short life and are said to pervade each and every part of the universe, even in tissues of plants and flesh of animals .The Roman Marcus Terentius Varro made references to microbes when he warned against locating a homestead in the vicinity of swamps "because there are bred certain minute creatures which cannot be seen by the eyes, which float in the air and enter the body through the mouth and nose and thereby cause serious diseases. **In the medieval Islamic world** At the golden age of Islamic civilization, some scientists had knowledge about microorganisms,		

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			such as Ibn Sina in his book the canon of medicine Ibn Zuhr (also known as Avenzoar) who discovered scabies germs, and Al-Razi who spoke of parasites in his book the virtuous life (al-Hawi). In 1546, Girolamo Fracastoro proposed that epidemic diseases were caused by transferable seedlike entities that could transmit infection by direct or indirect contact, or vehicle transmission. However, early claims about the existence of micro organisms were speculative, and not based on microscopic observation. Actual observation and discovery of microbes had to await the		

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			invention of the microscope in the 17th century. **Modern** In 1676, Anton van Leeuwenhoek, who lived most of his life in Delft, Holland, observed bacteria and other micro organisms using a single-lens microscope of his own design. While Van Leeuwenhoek is often cited as the first to observe microbes, Robert Hooke made the first recorded microscopic observation, of the fruiting bodies of molds, in 1665. It has, however, been suggested that a Jesuit priest called Athanasius Kircher was the first to observe micro-organisms.		

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			He was among the first to design magic lanterns for projection purposes, so he must have been well acquainted with the properties of lenses. One of his books contains a chapter in Latin, which reads in translation – 'Concerning the wonderful structure of things in nature, investigated by Microscope.' Here, he wrote 'who would believe that vinegar and milk abound with an innumerable multitude of worms.' He also noted that putrid material is full of innumerable creeping animalcule. These observations antedate Robert Hooke's Micro graphia by nearly 20 years and were published some 29 years before van Leeuwenhoek saw protozoa and 37 years before he described having		

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			seen bacteria. **joseph lister** (father of antiseptic surgery)was the first person who said infectious diseases are caused by micro-organism and was first person who used phenol as disinfectant on the open wounds of patients. The field of bacteriology (later a subdiscipline of microbiology) was founded in the 19th century by Ferdinand Cohn, a botanist whose studies on algae and photosynthetic bacteria led him to describe several bacteria including *Bacillus* and *Beggiatoa*. Cohn was also the first to formulate a scheme for thetaxonomic classification of bacteria and discover spores.		

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			Louis Pasteur (father of microbiology) and **Robert Koch** (father of bacteriology) were contemporaries of Cohn's and are often considered to be the father of microbiology and medical microbiology, respectively. Pasteur is most famous for his series of experiments designed to disprove the then widely held theory of spontaneous generation, thereby solidifying microbiology's identity as a biological science. Pasteur also designed methods for food preservation (pasteurization) and vaccines against several diseases such as anthrax, fowl cholera and rabies. Koch is best known for his contributions to the germ theory of disease,		

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			proving that specific diseases were caused by specific pathogenic micro-organisms. He developed a series of criteria that have become known as the Koch's postulates. Koch was one of the first scientists to focus on the isolation of bacteria in pure culture resulting in his description of several novel bacteria including mycobacterium tuberculosis the causative agent of tuberculosis. While Pasteur and Koch are often considered the founders of microbiology, their work did not accurately reflect the true diversity of the microbial world because of their exclusive focus on micro-organisms having direct medical relevance. It was not until the late 19th century		

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			and the work of Martinus Beijerinck and Sergei Winogradsky, the founders of general microbiology (an older term encompassing aspects of microbial physiology, diversity and ecology), that the true breadth of microbiology was revealed. Beijerinck made two major contributions to microbiology: the discovery of viruses and the development of enrichment culture techniques. While his work on the Tobacco Mosaic Virus established the basic principles of virology, it was his development of enrichment culturing that had the most immediate impact on microbiology by allowing for the cultivation of a wide range of microbes with wildly different physiologies. Winogradsky		

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			was the first to develop the concept of chemolithotrophy and to thereby reveal the essential role played by micro-organisms in geochemical processes. He was responsible for the first isolation and description of both nitrifying and nitrogen-fixing bacteria. French-Canadian microbiologist Felix d'Herelle co-discovered bacteriophages and was one of the earliest applied microbiologists.		
7.	5min	To Describe main discoveries in microbiology.	Main discoveries of Microbiology • Spores and sterilization • Spontaneous generation • Aseptic technique • Germ theory	T: explains with power presentation. S: listens and take notes.	Q;Explain main discoveries in microbiology

Summary: and Evaluation (10Min)

- Define microbiology, enlist the branches of microbiology.
- Explain the terminology related to microbiology.
- Explain history of microbiology

Assignment: Define the microbiology, enlist the branches of microbiology and explain the introduction and history of microbiology in detail.

Evaluation: unit test for 50 marks once the unit I is completed

Bibliography:

1. Satish gupte, the short text book of Medical Microbiology, 9th ed., jaypee, pp 11-16.
2. R. Ananthanarayan, text book of microbiology, 5th ed., jaypee.pp1-6.
3. Seema sood, Elsevier, microbiology for nurse, second edition, pp1-8.
4. IGNOU, BNS-102 applied sciences, Block 3rd microbiology-1,pp 5-8.
5. C.P.,baveja,text book of microbiology,second edition2005,arya publication,pp3-8.

LESSON PLAN

Subject : Microbiology

Unit : I

Topic : **History of bacteriology**.

Group : GNM I st year

Place : CLASS ROOM

Date & time: …….

Teaching methods : Lecture cum discussion

AV aids : Black Board and chalk, LCD, Computer

Students Pre requisite : The students should be able to define & describe the history of bacteriology.

General Objectives : At the end of the class the students will be able to gain knowledge regarding the history of bacteriology.

Specific Objectives:

1. To introduce the bacteriology.
2. Define the bacteriology.
3. To explain the history of bacteriology.

Review of previous class:

- Define microbiology.
- Enlist the Branches of microbiology.

Introduction:

In our last class we learn that bacteria have covered the biggest part in all types of the microorganisms and has a branch of microbiology called bacteriology.

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
1.	10min	To introduce the bacteriology.	**Introduction:** **Bacteriology** is the study of bacteria. This subdivision of microbiology involves the identification, classification, and characterization of bacterial species.	T: explains with power presentation. S: listens and take notes	Q;Explain bacteriology
2.	5min	Define the bacteriology.	**Definition:** Bacteriology is the branch of microbiology dealing with the study of bacteria.	T: explains with power presentation. S: listens and take notes	Q;Define bacteriology
3.	35min	To explain	The beginnings of bacteriology paralleled the development of the microscope.	T: explains with power	Q;Explain history of

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
		history of bacteriology	➢ The first person to see microorganisms was probably the Dutch naturalist Antonie van Leeuwenhoek, who in 1683 described some animalcules, as they were then called, in water, saliva, and other substances. These had been seen with a simple lens magnifying about 100–150 diameters. The organisms seem to correspond with some of the very large forms of bacteria as now recognized. ➢ As late as the mid-19th century, bacteria were known only to a few experts and in a few forms as curiosities of the microscope, chiefly interesting for their	presentation. S: listens and take notes	bacteriology

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			minuteness and motility. ➢ Modern understanding of the forms of bacteria dates from Ferdinand Cohn's brilliant classifications, the chief results of which were published at various periods between 1853 and 1872. ➢ While Cohn and others advanced knowledge of the morphology of bacteria, other researchers, such as Louis Pasteur and Robert Koch, established the connections between bacteria and the processes of fermentation and disease, in the process discarding the theory of spontaneous generation and improving antisepsis in medical treatment.		

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			➢ The modern methods of bacteriological technique had their beginnings in 1870–85 with the introduction of the use of stains and by the discovery of the method of separating mixtures of organisms on plates of nutrient media solidified with gelatine or agar. ➢ Important discoveries came in 1880 and 1881, when Pasteur succeeded in immunizing animals against two diseases caused by bacteria. His research led to a study of disease prevention and the treatment of disease by vaccines and immune serums (a branch of medicine now called immunology).		

S.NO.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			Other scientists recognized the importance of bacteria in agriculture and the dairy industry. Bacteriological study subsequently developed a number of specializations, among which are agricultural, or soil, bacteriology; clinical diagnostic bacteriology; industrial bacteriology; marine bacteriology; public-health bacteriology; sanitary, or hygienic, bacteriology.		

Summary &Evaluation: - (10 mins)

- Explain bacteriology.
- Define bacteriology
- Explain history of bacteriology

Assignment:

Define bacteriology & describe the history of bacteriology.

Evaluation: Unit test for 50 marks once the unit I is completed

Bibliography:

1. Satish gupte, the short text book of Medical Microbiology, 9th ed., jaypee, pp 9-21.
2. R. Ananthanarayan, text book of microbiology, 5th ed., jaypee.pp 40-43.
3. Seema sood, Elsevier, microbiology for nurse, second edition, pp1-8.
4. C.P.,baveja,text book of microbiology,second edition2005,arya publication,pp3-8.

LESSON PLAN

Subject : Microbiology

Unit : I

Topic : **Scope of microbiology in nursing**.

Group : GNM Ist year

Place : CLASS ROOM

Date & time : ……..

Teaching methods : Lecture cum discussion

AV aids : Black Board and chalk, LCD, Computer

Students Pre requisite : The students should be able to describe the scope of microbiology in nursing.

General Objectives : At the end of the class the students will be able to gain knowledge regarding the scope of microbiology in nursing.

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Specific Objectives**:** At the end of the class the students will be able to

1. To describe reasons to study microbiology
2. To describe role of microbiology in human welfare.
3. To describe scope of microbiology in general.
4. To describe the importance of medical microbiology
5. To describe the scope of microbiology in nursing.

Introduction:

Every student wants to know that after completion of my degree or diploma course, how much and what types of scopes will be available to me, so today we will discuss about the scope of microbiology in nursing.

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
1.	5min	To describe reasons to study microbiology	3 reasons why study microbiology 1. Microbes are an essential part of our environment 2.Most microbes function in a beneficial way a. Maintaining the balance of nature b. As source of food c. Production of antibiotics d. Environmental clean-up 3. Only a small percentage of all microbes are pathogenic or causes disease.	T: explains with power presentation. S: listens and take notes.	Q;Why should we study microbiology
2.	5min	To describe role of microbiology in human welfare.	**<u>Role of Microbiology in human welfare</u>** The discussion on the role of microbes in human welfare may be divided under two headings - good and bad. Microbes as we know are capable of both good and bad as for as human life is concerned. We will now list both the harm and benefit by microbes and then let us draw a conclusion as to how microbiology has helped us to control or kill the *bad* microbes and make maximum	T: explains with power presentation. S: listens and take notes.	Q;Explain role of microbiology in human welfare.

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
3.	10min	To describe the importance of medical microbiology	**Importance of medical microbiology:** In medicine microbiology is taught to let pupil understand Types of microbial diseases; i.e. how diseases are caused by microbes. Their types like bacterial, viral, fungal etc. Diagnosis and treatment; Even diagnosis of the disease causing microbe is taught so as to give right drug and combat infection effectively. The identification of specific microbe is done by help of microbiological assays.	T: explains with power presentation. S: listens and take notes.	Q;Explain the importance of medical microbiology
4.	10min	To describe scope of microbiology in general.	**Scope of Microbiology** • Immunology • Public health microbiology & epidemiology • Food, dairy and aquatic microbiology • Agricultural microbiology • Biotechnology	T: explains with power presentation. S: listens and take notes.	Q;Explain the scope of microbiology in general

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			• Genetic engineering & recombinant DNA technology		
5.	20min	To describe scope of microbiology	**<u>Scope of microbiology in nursing:</u>** 1. Prognosis of disease: - Use of microbiology in nursing is concerned with diagnosis. It also helps to see how the patient's health progresses during the treatment. The prognosis of disease as effective treatment & curing predict by use of microbiology. 2. Treatment: - Nurses use hot water and antiseptics as a measure to sterilize the surgical knives, needles, scissors and other metals instruments to free from microbes. Isolation is provided to patient with communicable disease. 3. Source of infection: - Microbiology also gives knowledge to nurses on how to handle a patient and his sample infected with communicable diseases.	T: explains with power presentation. S: listens and take notes.	Q;Explain the scope of microbiology in nursing

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			4. Guidance in treatment: - Many patients admitted in the hospital are prescribed with antibiotic as part of treatment. But not all of them will be effective to the patients. Then to test effectiveness, the patient's sputum, faecal, urine or blood sample taken. This sample is examined for the type of microbes and based on the identification, the right antibiotic is given. 5. Blood group testing: - Further nurse can also identify the blood group of the people by simple immune reactions. 6. Diagnoctic: - It also helps detect diseases like tuberculosis by simple skin test namely the Mantoux test. Also diagnostic tests like Elisa, electrophoreis and radioimmuno assay also use principles of microbiology for identification of disease.		

Summary: and Evaluation (10Min)

Today we had discussed the importance & scope of microbiology in general & in nursing.

Assignment:

- Describe the importance & scope of microbiology in nursing.

Evaluation

- Describe importance of microbiology.
- Describe scope of microbiology in nursing.

Bibliography:

1. Satish gupte, the short text book of Medical Microbiology, 9th ed., jaypee, pp 15-17.
2. R. Ananthanarayan, text book of microbiology, 5th ed., jaypee.pp1-6.

LESSON PLAN

Subject : Microbiology

Unit : II

Topic : **Classification of micro -organisms**.

Group : GNM Ist year

Place : CLASS ROOM

Date & time : ……

Teaching methods : Lecture cum discussion

AV aids : Black Board and chalk, LCD, Computer

Students Pre requisite : The students should be able to use a taxonomic key to identify organisms. Students will classify certain bacteria, protists, and viruses using a classification or taxonomic key.

General Objectives : At the end of the class the students will be able to gain knowledge regarding the classification of micro organisms.

Specific objectives: At the end of the class the students will be able to

1. Define taxonomy.
2. To classify microorganisms into categories based on their characteristics.
3. To describe the classical characteristics.
4. To describe the molecular characteristics
5. To classify micro organisms on their risk.
6. To classify microbes according to size, shape and structure.

Introduction:

What characteristics might they use to group their clothes into different groups? How items are classified or grouped in a grocery store. Think about how you look for items in a grocery store. You know that you can find milk, butter, and cheese on the same aisle because the store puts things that are similar to each other on the same aisle. In Biology, we rely on classification to group living organisms based on how closely related to each other they are.

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
1.	5min	Define taxonomy.	Taxonomy is the classification of organisms into groups based on their similarities. A taxonomic, or classification key is a listing of specific characteristics. Each level of a taxonomic system becomes more specific.	T: explains with power presentation. S: listens and take notes.	Q;Define taxonomy
2.	5min	To classify microorganisms into categories based on their characteristics.	Many characteristic features are used in classifying and identifying microorganisms. In general, these characteristic features have been divided into two major categories such as classical and molecular characteristics.	T: explains with power presentation. S: listens and take notes.	Q;How you will classify microorganisms into categories based on their characteristics.
3.	15min	To describe the classical characteristics.	**Classical characteristics** The classical type of approaches such as morphological, physiological, biochemical, ecological and genetic characteristics have been widely	T: explains with power presentation. S: listens and	Q; Explain the classical characteristics of

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			employed to study microbial taxonomy and it also provide phylogenetic information of microorganisms. **<u>Morphological characteristics:-</u>** Morphological features are important in microbial taxonomy for many reasons. Morphology is easy to study and analyze both eucaryotic and procaryotic microorganisms. Many different morphological features are used in the classification and identification of microorganisms. Some of these features are cell size, cell shape, colonial morphology, ultrastructural characteristics, staining behavior, cilia and flagella, mechanism of	take notes.	microorganism.

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			motility, color etc. **<u>Physiological and Metabolic characteristics:-</u>** Physiological and metabolic characteristics are very useful because they are directly related to the nature and activity of microbial enzymes and transport proteins. Because proteins are gene products, analysis of these characteristics provides an indirect comparison of microbial genomes. Some of the physiological and metabolic characteristic features are carbon and nitrogen sources, cell structure, energy sources, fermentation product, nutritional type, growth temperature		

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			optimum and range, luminescence, motility, osmotic tolerance, oxygen requirements, pH optimum and growth range, photosynthetic pigments, salt tolerance, sensitivity to metabolic and antibiotics etc. **Ecological characteristics:-** Microorganisms are well associated and growing in terrestrial fresh water and marine environments. The taxonomically important ecological properties are life cycle patterns, the nature of symbiotic relationship, the ability to cause decease in particular host and habitat preference such as the temperature,		

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			pH, oxygen and osmotic concentration. **Genetic characteristics:-** Most eucaryotes are able to reproduce sexually, hence genetic analysis has been of considerable usefulness in the classification of these type of microorganisms. However, procaryotic do not produce sexually and chromosomal gene exchange (through transformation and conjugation) is sometimes useful in the classification of procaryotes.		
4.	5min	To describe the	**Molecular characteristics:-**	T: explains	Q;Explain the

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
		molecular characteristics	The recent molecular approaches such as comparison of protein, nucleic acid base composition, and nucleic acid hybridization and sequencing are the most powerful molecular tools have been employed to study the taxonomy of some microbial groups, especially important for the procaryotic taxonomy.	with power presentation. S: listens and take notes.	molecular characteristics of microorganism.
5.	5min	To classify micro organisms on their risk.	**Classification based on their risk Categories:-** Harmless microorganisms (EFB class 1) Micro-organisms that have never been identified as causative agents of disease in man and that offer no threat to the	T: explains with power presentation. S: listens and take notes.	Q;How you will classify micro organisms on their risk.

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			environment. Low-risk microorganisms (EFB class 2) Micro-organisms that may cause disease in man and might, therefore, offer a hazard to laboratory workers. They are unlikely to spread in the environment. Prophylactics are available and treatment is effective. Medium-risk microorganisms (EFB class 3) Micro-organisms that offer a severe threat to the health of laboratory workers but a comparatively small risk to the population at		

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			large. Prophylactics are available and treatment is effective. High-risk microorganisms (EFB class 4) Micro-organisms that cause severe illness in man and offer a serious hazard to laboratory workers and people at large. In general effective prophylactics are not available and no effective treatment is known. Environmental-risk microorganisms Micro-organisms that offer a more severe threat to the environment than to man. They		

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			may be responsible for heavy economic losses. This group includes several classes, Ep 1, Ep 2, Ep 3, to accommodate plant pathogens.		

Summary and Evaluation (10Min):

- How you will classify microorganisms into categories based on their characteristics.
- Explain the classical characteristics of microorganism
- Explain the molecular characteristics of microorganism.
- How you will classify microbes according to their size, shape and structure.

Assignment: Describe the classification of micro-organisms according to their size, shape & structure.

Evaluation: Unit test for 50 marks once the unit II is completed.

Bibliography:

1.Tortora, G.J. Microbiology an Introduction 10th ed. Page no 16-23.

LESSON PLAN

Subject	:	Microbiology
Unit	:	II
Topic	:	**Characteristics of micro organisms.**
Group	:	GNM Ist Year
Place	:	CLASS ROOM
Date & time	:	…….
Teaching methods	:	Lecture cum discussion
AV aids	:	Black Board and chalk, LCD, Computer
Students Pre requisite	:	The students should be able to describe the characteristics of micro organisms.
General Objectives	:	At the end of the class the students will be able to gain knowledge regarding the characteristics of Micro-organisms.

Specific Objectives: At the end of the class the students will be able to.

1. To describe the general characteristics of micro organisms by a table
2. To describe the nutritional and physiological characteristics
3. To describe reproduction & growth in microorganism.
4. To describe antigenic and genetic characteristics.

Introduction:

Every living being has some significant qualities, by the help of theses quality entire group is easily identify, similarly micro-organisms has the significant qualities called characteristics.

<table>
<tr><th>S. No.</th><th>Duration</th><th>Specific objectives</th><th>Content</th><th>Teaching learning activity</th><th>Evaluation</th></tr>
<tr><td>1.</td><td>10min</td><td>To describe the general characteristics of micro organisms</td><td>
<table>
<tr><th>Characteristics</th><th>Molds</th><th>Yeasts</th><th>Bacteria</th></tr>
<tr><td>Size</td><td>5-12 µ dia up to 25 µ length</td><td>5-12 µ</td><td>1-2 µ</td></tr>
<tr><td>Reproduction</td><td>Slow asexual-spores sexual cycle</td><td>intermediate budscars-limit sexual-ascus zygote</td><td>Fast binary fission infinite</td></tr>
<tr><td>Diversity (types)</td><td>High</td><td>moderate</td><td>High</td></tr>
<tr><td>End products (1°, 2° metabolites)</td><td>Greatest</td><td>least</td><td>very high</td></tr>
<tr><td>Substrate utilization</td><td>High</td><td>low</td><td>Highest</td></tr>
</table>
</td><td>T: explains with power presentation.
S: listens and take notes.</td><td>Q;Explain General characteristics of micro organisms.</td></tr>
</table>

<table>
<tr><th>S. No.</th><th>Duration</th><th>Specific objectives</th><th>Content</th><th>Teaching learning activity</th><th>Evaluation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>pH</td><td>acid tolerant 3-8</td><td>acid tolerant 4-8</td><td>Neutral 5-10</td></tr>
<tr><td>Oxygen</td><td>Aerobic</td><td>facultative</td><td>Aerobic Anaerobic</td></tr>
<tr><td>Moisture tolerance</td><td>very dry</td><td>high level of water</td><td>High level of water</td></tr>
<tr><td>Food spoilage</td><td>low pH foods dryer foods</td><td>low pH foods high H_2O content</td><td>Neutral pH foods high H_2O content</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>2.</td><td>15min</td><td>To describe the nutritional and physiological characteristics.</td><td><u>Nutritional and physiological characteristics</u>
Microorganisms as a group exhibit great diversity in their nutritional requirements and in the environmental conditions that will support their growth. No other group of living organisms comes close to matching the versatility and</td><td>T: explains with black board & chalk.
S: listens and</td><td>Q;Explain nutrition and physiological characteristics of microorganism.</td></tr>
</table>

S. No.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			diversity of microbes in this respect. Some species will grow in a solution composed only of inorganic salts (one of the salts must be a compound of nitrogen) and a source of carbon dioxide (CO_2); these are called “autotrophs”. Many, but not all, of these microbes are autotrophic via photosynthesis. Organisms requiring any other carbon source are termed “heterotrophs”. These microbes commonly make use of carbohydrates, lipids, and proteins, although many microbes can metabolize other organic compounds such as hydrocarbons. Others, particularly the fungi, are decomposers. Many species of bacteria also require specific additional nutrients such as minerals, amino acids, and vitamins. Various protozoans, fungi, and bacteria are parasites, either exclusively (obligate parasites) or with the ability to live independently (facultative parasites). If the nutritional requirements of a micro organism are known, a chemically defined medium containing only those chemicals can be prepared. More complex media are also	take notes.	

S. No.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			routinely used; these generally consist of peptone (a partially digested protein), meat extract, and sometimes yeast extract. When a solid medium is desired, agar is added to the above ingredients. Agar is a complex polysaccharide extracted from marine algae. It has several properties that make it an ideal solidifying substance for microbiological media, particularly its resistance to microbial degradation. **Physical conditions:** Microorganisms vary widely in terms of the physical conditions required for growth. For example, some are aerobes (require oxygen), some are anaerobes (grow only in the absence of oxygen), and some are facultative (they grow in either condition). Eukaryotic microbes are generally aerobic. Microorganisms that grow at temperatures below 20 °C (68 °F) are called " psychrophiles" ; those that grow best at 20–40 °C (68–104 °F) are called mesophiles; a third group, the "thermophiles", require temperatures above 40 °C. Those organisms which grow under optimally under one or more physical or		

S. No.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			chemical extremes, such as temperature, pressure, pH, or salinity, are referred to as “extremophiles”. Bacteria exhibit the widest range of temperature requirements. Whereas bacterial (and fungal) growth is commonly observed in food that has been refrigerated for a long period, some recently isolated archaea (e.g.,*Pyrodictium occutum* and *Pyrococcus woesei*) grow at temperatures above 100 °C (212 °F). Other physical conditions that affect the growth of microorganisms are acidity or basicity (pH), osmotic pressure, and hydrostatic pressure. The optimal pH for most bacteria associated with the human environment is in the neutral range near pH 7, though other species grow under extremely basic or acidic conditions. Most fungi are favoured by a slightly lower pH (5–6); protozoa require a range of pH 6.7–7.7; algae are similar to bacteria in their requirements except for the fact that they are photosynthetic.		

S. No.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			Reproduction and growth Bacteria reproduce primarily by binary fission, an asexual process whereby a single cell divides into two. Under ideal conditions some bacterial species may divide every 10–15 minutes—a doubling of the population at these time intervals. Eukaryotic microorganisms reproduce by a variety of processes, both asexual and sexual. Some require multiple hosts or carriers (vectors) to complete their life cycles. Viruses, on the other hand, are produced by the host cell that they infect but are not capable of self-reproduction. The study of the growth and reproduction of microorganisms requires techniques for cultivating them in pure culture in the laboratory. Data collected on the microbial population over a period of time, under controlled laboratory conditions, allow a characteristic growth curve to be constructed for a species.		
3.	15min	To describe	**Metabolism**	T;Explain	Q;Explain

S. No.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
		reproduction,growth&metabolism in microorganism.	Collectively, microorganisms show remarkable diversity in their ability to produce complex substances from simple chemicals and to decompose complex materials to simple chemicals. An example of their synthetic ability is nitrogen fixation—the production of amino acids, proteins, and other organic nitrogen compounds from atmospheric nitrogen (N_2). Certain bacteria and blue-green algae (cyanobacteria) are the only organisms capable of this ecologically vital process. An example of microbes' ability to decompose complex materials is shown by the white and brown rot fungi that decompose wood to simple compounds, including CO_2. Laboratory procedures are available that make it possible to determine the biochemical capability of a species qualitatively and quantitatively. Routine techniques can identify which compounds or substances are degraded by a specific microbe and which products are synthesized. Through more elaborate experimentation it is possible to	with black board &chalk S;listen &take notes.	reproduction,growth &metabolism in microorganism.

S. No.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			determine step-by-step how the microbe performs these biochemical changes. Studies can be performed in a number of ways using growing cultures, “resting cells” (suspensions of cells), cell-free extracts, or enzyme preparations from cells. Certain biochemical tests are routinely used to identify microbes—though more in the case of bacteria than algae, fungi, or protozoa. The adoption of routine sets of laboratory tests has allowed automated instrumentation to perform the tests. For instance, technicians often simply inoculate individual units of a “chamber” that is preloaded with a specific chemical substance (the substrate) and then place the chamber into an apparatus that serves as an incubator and analyzer. The apparatus automatically records the results and is frequently capable of calculating the degree of accuracy of the identification. _____		

S. No.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			Pathogenesis Some microorganisms cause diseases of humans, other animals, and plants. Such microbes are called pathogens. Pathogens are identified by the hosts they infect and the symptoms they cause; it is also important to identify the specific properties of the pathogen that contribute to its infectious capacity—a characteristic known as virulence. The more virulent a pathogen, the fewer the number needed to establish an infection. **Antigenic characteristics** An antigen is a substance that, when introduced into an animal body, stimulates the production of specific substances (antibodies) that react or unite with the antigen. Microbial cells and viruses contain a variety of antigenic substances. A significant feature of antigen-antibody reactions is specificity; the antibodies formed as a result of inoculating an animal with one microbe will not react with the antibodies formed by inoculation with a different		

S. No.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
		To describe antigenic and genetic characteristics	microbe. Antibodies appear in the blood serum of animals, and laboratory tests of antigen-antibody reactions are performed by using sera—hence the term *serological reactions*. Thus, it is possible to characterize a microorganism by its antigenic makeup as well as to identify microorganisms by using one of many different serological tests. Antigens and antibodies are important aspects of immunity, and immunology is included in the science of microbiology. **Genetic characterization** Since the last quarter of the 20th century, researchers have accumulated a vast amount of information elucidating in precise detail the chemical composition, synthesis, and replication of the genetic material of cells. Much of this research has been done by using microorganisms, and techniques have been developed that permit experimentation at the molecular level. For instance, experiments determining the degree of similarity between different organisms' DNA		

S. No.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
4.	10min		and RNA have provided new insights for the classification of microorganisms. Test kits are now available for the identification of microorganisms, particularly bacteria, by DNA probes. Since the invention of recombinant DNA technology in 1973, techniques have been developed whereby genes from one cell can be transferred to an entirely different cell, as when a gene is transferred from an animal cell to a bacterium or from a bacterium to a plant cell. Recombinant DNA technology has opened the door to many new medical and industrial applications of microbiology, and it is often referred to as genetic engineering	T;Explain with black board & chalk S;listen & take notes.	Q;Explain antigenic &genetic characteristics of microorgnasim.

Summary and Evaluation (10Min)

- Explain the characteristics of micro organisms.
- Explain the nutritional and physiological characteristics.
- Explain the reproduction & growth in microorganism.
- Explain the antigenic and genetic characteristics of microorganism.

Assignment: Describe the characteristics of micro organisms.

Evaluation: Unit test for 50 marks once the unit II is completed.

Bibliography:

LESSON PLAN

Subject	:	Microbiology
Unit	:	II
Topic	:	**Method & rate of reproduction.**
Group	:	GNM Ist Year
Place	:	CLASS ROOM
Date & time	:	…….
Teaching methods	:	Lecture cum discussion
AV aids	:	Black Board and chalk, LCD, Computer
Students Pre requisite	:	The students should be able to introduce and describe the method & rate of reproduction.

General Objectives : At the end of the class the students will be able to gain knowledge regarding the method & rate of reproduction. .

Specific Objectives:

1. To introduce the reproduction of microbes.
2. To describe types of reproduction.

Introduction:

Every living being have a different method &rate of reproduction, so today we will discuss about the method & rate of reproduction of microbes.

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
1.	10 min	To introduce the reproduction of microbes.	**Introduction** The bacteria reproduce by a sexual binary fission. The DNA is a double helix with complementary nucleotide sequences in the two strands. At replication the strands separate and new complementary strands are formed on each of the originals so that two identical double helices are	T: explains with power presentation. S: listens and take notes.	Q; explain how microbes reproduce

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			produced.		
2.	40 min	To describe types of reproduction.	**Types of reproduction** All living things reproduce. Reproduction is the process of generating offspring. There are two main types of reproduction: sexual and asexual. Some organisms reproduce by only one method of reproduction and others can reproduce using either method. Microorganisms can reproduce sexually and asexually. The type of reproduction where cells from only one parent are used is called asexual reproduction. Only genetically identical organisms are produced by this	T: explains with power presentation. S: listens and take notes.	Q; Explain types of reproduction in microbes.

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			type of reproduction. In evolutionary terms, asexual reproduction came before sexual reproduction. During sexual reproduction, two cells, one from each parent, fuse to form a new organism. Microbes have survived for billions of years because they can reproduce quickly and in so many different ways. **<u>Archaea and bacteria</u>** Archaea and bacteria mostly reproduce through binary fission. Binary fission is a form of asexual reproduction in which a cell divides into two daughter cells after DNA replication. Bacteria cannot reproduce sexually, but some types of bacteria exchange their genetic information in a process called genetic recombination. During this		Q;Explain how bacteria

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			process, two bacteria exchange their DNA fragments through the following processes: • By individual contact - conjugation. • By exposure to DNA of dead bacteria - transformation. • By exchange of plasmid genes. • By a viral agent (bacteriophage) - transduction. Some bacterial cells can divide in about 20 minutes but most need a few hours to reproduce. Under unfavourable condition, some bacteria form spores with thickened coverings. These spores will return to the bacterium form when conditions		reproduce

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			improve. Bacteria grow and reproduce very quickly only when conditions are right. Most bacteria prefer moist, warm surroundings. That is why the human body is their 'favourite' habitat. *See image 1.* **Cyanobacteria** Cyanobacteria are able to reproduce through a variety of methods: binary fission; budding and fragmentation. These forms of reproduction explain the variety of cyanobacteria colonies that include patches, slimy masses, strings, filaments or branched filaments. Budding involves the formation of smaller cells		

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			from larger ones. Fragmentation involves breaking into fragments, each of which then regenerates into a complete organism. Photosynthesis plays a large and important role in the reproduction and growth of cyanobacteria. The wavelength of the light available determines what form of cyanobacteria will grow. **Protozoa** Protozoa mostly reproduce by binary fission. Sometimes they reproduce by budding, or a process called schizogony. Schizogony is a multiple cellular fission. During this process the cell's nucleus divides several times before the cell itself divides into multiple new cells, each with one of these new		

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			nuclei. Some protozoans can reproduce sexually. They form sex cells - gametes that fuse together, forming a new organism. Sometimes their gametes look similar. These gametes are called isogametes. Anisogametes are gametes that vary in size and shape. **<u>Fungi</u>** Most fungi can reproduce both sexually and asexually. Their asexual reproduction includes binary fission, budding, fragmentation and reproduction by spores. The specialised hyphae of fungi, called sporangiophores, produce spores that form in a capsule, called a sporangium. When the sporangium is mature enough it opens up releasing		Q;explain how protozoa reproduce

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			the spores. The spores are the reproductive cells of fungi. Each spore cell has a nucleus and dehydrated cytoplasm surrounded by a protective coating. They can exist for a very long period of time waiting for the right conditions. Fungi produce sexual and asexual spores. There are no male or female fungi. During sexual reproduction, two mating types, called plus (+) mating type and minus (-) mating type, fuse. These fused hyphae form a specialised structure which produces and scatters genetically-diverse spores. Fungal spores cannot move by themselves, but because they are small and light they can be dispersed by wind, animals, insects or water. Fungal spores can be found almost everywhere. Unlike most		

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			eukaryotes, most fungi are haploid (have one set of chromosomes) throughout most of their lives. **<u>Viruses</u>** Viruses can reproduce only in a host cell. When a cell becomes infected by a virus it becomes a virus-making device. The assembly of the viral genome and its capsid does not involve enzymes as is the case during cellular DNA replication. The process is usually spontaneous. When the infected cell is full of newly-created viruses, it is broken by viral enzymes. These new viruses infect more cells. Viruses mutate easily, creating new forms of the same virus. That ability makes it difficult to fight some viral diseases because antibodies that worked		

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			for one viral form do not work for the new one. That is why people get colds or flu every year		Q;explain how fungi reproduce

Summary: and Evaluation (10Min) • Explain how microbes reproduce. • Explain types of reproduction in microbes. • Explain how bacteria reproduce
Assignment: Describe the types of reproduction of microbes in detail.
Evaluation: Unit test for 50 marks once the unit II is completed.
Bibliography: .

LESSON PLAN

Subject : Microbiology

Unit : II

Topic : **Normal flora of the body**

Group : GNM Ist Year

Place : CLASS ROOM

Date & time : …….

Teaching methods : Lecture cum discussion

AV aids : Black Board and chalk, LCD, Computer

Students Pre requisite : The students should be able to introduce and describe the history of microbiology.

General Objectives : At the end of the class the students will be able to describe the normal flora of the body

Specific Objectives**:** At the end of the class the students will be able to

1. To introduce the normal flora of the body.
2. To describe types of microbial flora of the body.
3. To describe function of microbial flora.
4. To enlist contents of microbial flora.
5. To describe advantages and disadvantages of normal flora.

Review of previous class**:** enlist the methods of reproduction of micro organism.

Introduction:

How many layers of a thermos has, the outer, the middle and inner layer, function of these layers is regulation of temperature. It means they are giving protection to content, which is pouring in the internal layer. Same as this the normal flora of the body protects the content of related organs.

S.no	Duration	Specific objectives	Content	Teaching learning activities	Evalaution
1.	5 min	To introduce micro organism	**Introduction:** Normal human body has a wide variety of micro organisms, on its surface as well inside. These micro organisms predominantly constitute bacteria.	T: explains with power presentation. S: listens and take notes.	
2.	10 min	To describe types of microbial flora of the body.	**Types of microbial flora on the human body:** It has divided into two broad categories :- 1. Resident flora: this consists of relatively fixed types of micro organisms regularly found at a given site of the body at a given age. If this flora is disturbed due to extraneous condition, it promptly re-establishes itself.	T: explains with power presentation. S: listens and take notes.	Q;which types of microbial flora present on the body.

S.no	Duration	Specific objectives	Content	Teaching learning activities	Evalaution
			2.transient flora: This consists of non-pathogenic or potentially pathogenic micro organisms that inhabits the skin or mucous membranes for a short duration, which may be a few hours, weeks, or days . These organisms are invariably derived from the environment and do not produce disease under normal circumstances. However, if due to some reason, normal flora is disturbed, the transient flora can colonise and even produce disease.		
3.	10 min	To describe function of microbial flora.	**Function:-** 1 it maintains the normal function the body for	T: explains with power presentation.	Q; what is the function of microbial flora.

S.no	Duration	Specific objectives	Content	Teaching learning activities	Evalaution
			e.g., the resident flora of the intestinal tract synthesises vitamins k and B and help in absorption of nutrients and breakdown product. 2. They are also involved in conversion of bile pigments and bile acid and provide antagonism to microbial pathogens. 3. The flora of skin and mucus membrane prevents colonisation by pathogens, possibly by a process of bacterial interference which involves competition for receptors or binding sites of host cells, competition for nutrients, or inhibition by	S: listens and take notes.	

S.no	Duration	Specific objectives	Content	Teaching learning activities	Evalaution
			toxic product.		
4.	5 min	To enlist contents of microbial flora.	**<u>Normal flora of the skin consists of the following:-</u>** 1.diphtetheroid bacilli 2. coagulase-negative staphylococci 3. alpha-haemolytic streptococci 4. enterococci 5.aerobic spore bearers 6.micrococcus	T: explains with power presentation. S: listens and take notes.	Q;Explain contents of microbial flora.

S.no	Duration	Specific objectives	Content	Teaching learning activities	Evalaution
			7.gram negative coliform bacilli and acinetobacter 8. staphylococcus aureus 9.non pathogenic mycobacteria NOTE:- the sweating or washing and bathing cannot eliminate or alter the normal resident flora of the skin.		

S.no	Duration	Specific objectives	Content	Teaching learning activities	Evalaution
5.	10min	To describe normal flora of the various body part	**<u>Normal flora of mouth & upper respiratory tract:-</u>** At birth, the mucous membrane of the mouth and pharynx are often sterile, but within 4 to 12 hours of birth, streptococcus viridans, which constitute the predominant resident flora, appear and remain so for the rest of life. Once the teeth begin to erupt, the anaerobic organisms too appear.e.g. Fusobacterium sp. The pharynx and the trachea have a similar flora. The bronchi have very few bacteria whereas the smaller bronchi and alveoli are normally sterile. The flora noses mainly consist of diphtheroids, staphylococci or streptococci. **NORMAL FLORA OF THE GESTRO INTESTINAL TRACT:-** In most of the newborns, intestine is sterile but	T: explains with power presentation. S: listens and take notes.	Q;Explain normal flora of the various body part.

S.no	Duration	Specific objectives	Content	Teaching learning activities	Evalaution
6.	10 min	To describe advantages and disadvantages of normal flora.	**Advantages of normal flora:-** 1. They prevent colonization of potential pathogen, e.g., skin bacteria produce fatty acids, gut bacteria release bacteriocin, colic in plus metabolic wastes and lack of oxygen, vaginal lactobacilli maintain acid pH, etc. 2. Gut bacteria release vitamin B and K. 3. Antigenic stimulation provided by intestinal flora is considered importance in ensuring the normal development of the immune system. 4. Antibodies produced in response to normal flora cross react with pathogens thus raising immune status of the host. The endotoxin liberated by normal flora trigger alternative complement pathogen. **Disadvantage:-**	T: explains with power presentation. S: listens and take notes.	Q;What are the advantages and disadvantages of normal flora

Summary and Evaluation (10Min):

- Enlist the types of normal flora.
- Describe the functions of the normal floras
- Explain the advantages and disadvantages.

Assignment: Describe the types, function, advantages and disadvantages of normal flora?

Evaluation : Unit test for 50 marks once the unit II is completed.

Bibliography:

1. Seema sood, Elsevier, microbiology for nurse, second edition, pp9-12.

LESSON PLAN

Subject : Microbiology

Unit : II

Topic : **Pathogenesis**

Group : GNM Ist Year

Place : CLASS ROOM

Date & time : …….

Teaching methods : Lecture cum discussion

AV aids : Black Board and chalk, LCD, Computer

Students Pre requisite : The students should be able to define and describe the over view of pathogenesis.

General Objectives : At the end of the class the students will be able to gain knowledge regarding pathogenesis.

Specific Objectives: At the end of the class the students will be able

1. To Define & describe the process of pathogenesis.
2. To Define host mediated pathogenesis.& describe intracellular growth
3. To define and describe the role of bacterial virulence in the pathogenesis of disease
4. To describe host susceptibility.
5. To define Bacterial Infectivity.
6. To define Host Resistance.

Review of previous class: define pathogens & pathogenesis.

Introduction:

All of us were suffered with a minor or major illness in our life. What do you think, why we get illness, it can be understand by the process of pathogenesis, so today we will discuss about the topic pathogenesis.

S.no.	Duration	Specific objectives	Content	Teaching learning	Evaluation
1.	15 min	Define & describe the process of pathogenesis	**Definition :** Infection is the invasion of the host by microorganisms, which then multiply in close association with the host's tissues. Infection is distinguished from disease, a morbid process that does not necessarily involve infection (diabetes, for example, is a disease with no known causative agent). Bacteria can cause a multitude of different infections, ranging in severity from in apparent to fulminating. "The capacity of a bacterium to cause disease reflects its relative pathogenicity." On this basis, bacteria can be	T: explains with power presentation. S: listens and take notes.	Define pathogenesis? Describe the process of pathogenesis?

S.no.	Duration	Specific objectives	Content	Teaching learning	Evaluation
			organized into three major groups. When isolated from a patient, frank or primary pathogens are considered to be probable agents of disease (e.g., when the cause of diarrhoeal disease is identified by the laboratory isolation of salmonella spp. from feces). Opportunistic pathogens are those isolated from patients whose host defense mechanisms have been compromised. They may be the agents of disease (e.g., in patients who have been predisposed to urinary tract infections with Escherichia coli by catheterization). Finally, some bacteria, such as Lactobacillus acidophilus, are considered to be non pathogens, because they rarely or		

S.no.	Duration	Specific objectives	Content	Teaching learning	Evaluation
			never cause human disease. Their categorization as non pathogens may change, however, because of the adaptability of bacteria and the detrimental effect of modern radiation therapy, chemotherapy, and immunotherapy on resistance mechanisms. In fact, some bacteria previously considered to be non pathogens are now known to cause disease. Serratia marcescens, example, is a common soil bacterium that causes pneumonia, urinary tract infections, and bacteraemia in compromised hosts. Virulence is the measure of the pathogenicity of an organism. The degree of virulence is related directly to the ability		

S.no.	Duration	Specific objectives	Content	Teaching learning	Evaluation
			of the organism to cause disease despite host resistance mechanisms; it is affected by numerous variables such as the number of infecting bacteria, route of entry into the body, specific and non specific host defense mechanisms, and virulence factors of the bacterium. Virulence can be measured experimentally by determining the number of bacteria required causing animal death, illness, or lesions in a defined period after the bacteria are administered by a designated route. Consequently, calculations of a lethal dose affecting 50 percent of a population of animals (LD_{50}) or an effective dose causing a disease symptom in 50 percent of a		

S.no.	Duration	Specific objectives	Content	Teaching learning	Evaluation
			population of animals (ED_{50}) are useful in comparing the relative virulence of different bacteria. It should be understood that the pathogenic mechanisms of many bacterial diseases are poorly understood, while those of others have been probed at the molecular level. The relative importance of an infectious disease to the health of humans and animals does not always coincide with the depth of our understanding of its pathogenesis		
2.	5 min	Define host mediated	**Host-mediated Pathogenesis**	T: explains with power	Define host mediated

S.no.	Duration	Specific objectives	Content	Teaching learning	Evaluation
		pathogenesis.& describe intracellular growth	In certain infections (e.g., tuberculosis), tissue damage results from the toxic mediators released by lymphoid cells rather than from bacterial toxins. **Intracellular Growth** Some bacteria (e.g., Rickettsia species) can grow only within eukaryotic cells, whereas others (e.g., Salmonella species) invade cells but do not require them for growth. Most pathogenic bacteria multiply in tissue fluids and not in host cells.	presentation. S: listens and take notes.	pathogenesis.& describe intracellular growth
3.	10 min	To define virulence and	**Virulence** is a harmful quality possessed by microorganisms that can cause disease.	T: explains with power	Define virulence Describe the role

S.no.	Duration	Specific objectives	Content	Teaching learning	Evaluation
		describe the role of bacterial virulence in the pathogenesis of disease.	Virulence factors help bacteria to (1) invade the host, (2) cause disease, and (3) evade host defences. The following are types of virulence factors: **Adherence Factors**: Many pathogenic bacteria colonize mucosal sites by using *pili* (fimbriae) to adhere to cells. **Invasion Factors**: Surface components that allow the bacterium to invade host cells can be encoded on plasmids, but more often are on the chromosome. **Capsules:** Many bacteria are surrounded by capsules that protect them from opsonization and phagocytosis. **Endotoxins**: The lipopolysaccharide endotoxins on Gram-negative bacteria	presentation. S: listens and take notes.	of virulence factors in pathogenesis of disease.

S.no.	Duration	Specific objectives	Content	Teaching learning	Evaluation
			cause fever, changes in blood pressure, inflammation, lethal shock, and many other toxic events. **Exotoxins**: Exotoxins include several types of protein toxins and enzymes produced and/or secreted from pathogenic bacteria. Major categories include cytotoxins, neurotoxins, and enterotoxins. **Siderophores**: Siderophores are iron-binding factors that allow some bacteria to compete with the host for iron, which is bound to hemoglobin, transferrin, and lactoferrin.		
4.	5 min	To describe host	Resistance to bacterial infections is enhanced by phagocytic cells and an intact immune system. Initial resistance is due to	T: explains with power presentation.	Describe host susceptibility.

S.no.	Duration	Specific objectives	Content	Teaching learning	Evaluation
		susceptibility.	non specific mechanisms. Specific immunity develops over time. Susceptibility to some infections is higher in the very young and the very old and in immuno suppressed patients.	S: listens and take notes.	
5.	5 min	To define Bacterial Infectivity.	**Bacterial Infectivity** Bacterial infectivity results from a disturbance in the balance between bacterial virulence and host resistance. The “objective” of bacteria is to multiply rather than to cause disease; it is in the best interest of the bacteria not to kill the host.	T: explains with power presentation. S: listens and take notes.	Define Bacterial infectivity.

S.no.	Duration	Specific objectives	Content	Teaching learning	Evaluation
6.	10 min	To define Host Resistance.	**Host Resistance** Numerous physical and chemical attributes of the host protect against bacterial infection. These defences include the antibacterial factors in secretions covering mucosal surfaces and rapid rate of replacement of skin and mucosal epithelial cells. Once the surface of the body is penetrated, bacteria encounter an environment virtually devoid of free iron needed for growth, which requires many of them to scavenge for this essential element. Bacteria invading tissues encounter phagocytic cells that recognize them as foreign, and through a complex signaling	T: explains with power presentation. S: listens and take notes.	define Host resistance.

S.no.	Duration	Specific objectives	Content	Teaching learning	Evaluation
			mechanism involving interleukins, eicosanoids, and complement, mediate an inflammatory response in which many lymphoid cells participate.		

Summary and Evaluation (10Min):

Today we have discussed about the process of pathogenesis.

- Describe the host susceptibility.
- Describe host mediated pathogenesis.

Assignment:

Define & describe pathogenesis.

Evaluation:

Unit test for 50 marks once the unit II is completed.

Bibliography:

1. R. Ananthanarayan, text book of microbiology, 5th ed., jaypee.pp59-64.
2. Seema sood, Elsevier, microbiology for nurse, second edition, pp46-59.
3. IGNOU, BNS-102 applied sciences, Block 3rd microbiology-1,pp 57-66.
4. C.P.,baveja,text book of microbiology,second edition2007,arya publication,pp30 to 32.

LESSON PLAN

Subject	:	Microbiology
Unit	:	II
Topic	:	**Methods study for microbes**
Group	:	GNM Ist Year
Place	:	CLASS ROOM
Date & time	:	…….
Teaching methods	:	Lecture cum discussion
AV aids	:	Black Board and chalk, LCD, Computer
Students Pre requisite	:	The students should be able to methods study for microbes.

General Objectives : At the end of the class the students will be able to describe methods study for microbes.

Specific Objectives:

1. To introduce the study of microbes
2. To describe the Microscopy
3. To describe the Phase Contrast Microscope
4. To describe the Ultra-violet Microscope
5. To describe the Electron Microscope
6. To describe the Acoustic Microscope

Review of previous class:

Describe the process of pathogenesis.

Introduction:

There are so many methods for the study of microbes, by which we can identify a pathogen & diagnose a disease.

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
1.		To introduce the study of microbes	**INTRODUCTION:** To study the microorganisms, these techniques are used:- • Microscopy • Phase Contrast Microscope • Ultra-violet Microscope • Electron Microscope • Acoustic Microscope One is to observe living unstained cell by hanging drop method and the other is to study stained dead cell by staining techniques. It may also be mentioned that for certain reserve materials in bacteria.	T: explains with power presentation. S: listens and take notes.	Introduce the study of microbes

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
2.		To describe the microscopy.	**Microscopy :-** The fascinating world of microorganisms would have remained unknown had the microscope not been invented. Roger Bacon (1267) described a lens for the first time. However, his observation was not pursued immediately thereafter. In 1590 glass polishers Hans and Zacchrius Jensen constructed a crude type of simple microscope by placing two lenses together, which permitted them to see minute objects. In 1609-1610 Galileo Galilei made the first simple microscope with a focusing device called 'occiale' and observed the water flea through his microscope. In 1617-1619 the first double lens microscope with a single convex objective and ocular appeared, the inventor of	T: explains with power presentation. S: listens and take notes.	Describe the microscopy.

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			which was thought to be the physicist C.Drebbel. This microscope was used to study the cells, plant and animal tissue, and also the minute living organisms. Till then, the name microscope had not been given to this device; the name 'microscope' was first proposed by Faber (or Fabri) in 1625. The credit of developing a compound microscope with multiple lenses goes to Robert Hooke (1665) of England. It was only after 1670 that a cloth merchant of Delft (Holland), Antony van Leeuvenkoek (1632-1723), started his hobby of making microscopes and in 1674 he discovered the fascinating microbial world through his microscope (50-270 times magnification). Considerable progress was made in improving the microscope in		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			nineteenth century. The introduction of oil-immersion lens by Amici in 1869, sub stage condenser by Abbe in 1872, apochromatic objectives with suitable eyepiece by Abbe and Zeiss in 1886 were landmarks in the improvement of compound microscope in the nineteenth century. **Compound Microscope** A compound microscope is the primary tool in the microbiology. Therefore, a clear understanding of structure, use and manipulations of a compound microscope is a must for		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			all students of microbiology. **a. Essential parts (fig.1)** The essential parts of usually used monocular compound microscope are the following: **Lenses:** The **eyepiece** with different magnifications (5-20 times). It has field lens towards the object and eye-lens close to the observer's eye. The **objectives** generally with three different magnifications viz., low (10 X), high *(40* X) and oil-imrnersion (97 X). The focal lengths of these are 16 mm, 4mm, and 1.6 mm respectively. These		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			objectives are mounted on a revolving nosepiece for convenience. The eyepiece and objectives are fitted at the two ends of a hollow tube called the 'body tube'. **Adjustment of objective lens:** In some microscopes coarse arid fine focusing adjustment knobs are both provided in order to lower or raise the body tube with lenses for rendering image clear. This is done by rotation of the knobs. The coarse adjustment is meant to bring the object into vision whereas the fine adjustment is used for focusing finer details.		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			Stage: The object to be observed is kept on a glass slides and placed on the stage. It may have clips to keep the slide in desired position or a mechanical stage for horizontal movement of the object. In some microscopes the stage may be raised or lowered with coarse and fine adjustments for focusing the object. **Mirror:** The mirror reflects light, which is transmitted through the object for observing it. The mirror has two planes, one concave and the other plane. When natural light is Available the plane mirror may be		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			used for reflection of light because concave mirror would form window images. However, with artificial illumination, the concave mirror is necessary for higher magnification whereas for lower, the plane mirror may be used. **Sub stage diaphragm:** This is meant to control the amount of light trans-mitted through the object. **Sub stage condenser:** The sub stage condenser consists of convex lenses which concentrate and intensify the light reflected by-the mirror. With objectives of magnification exceeding 10X, the use of condenser becomes		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			necessary for narrowing the core of transmitted light, which would fill the smaller aperture of the objective. The condensers usually employed are called 'Abbe' condensers and these are used with plane mirrors. **<u>Metric System For Measurement:</u>** 1/10th of a meter (dm) = 1 decimetre 1/100th of a meter (cm) = 1 centimetre 1/1000th of a meter (mm) = 1 millimetre		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			1/millionth of a meter = 1 micron (μ) 1/10 millionth of *a* meter (ft) =1 angstrom 1/billionth of a meter micron (nm or/J m) = 1 milli **b. <u>Methods for Studying Microorganisms with</u> a Compound Microscope:** Two methods are generally used, 'wet method' and 'dry and fix method'. **Wet method:** There are two primary methods generally used for studying microorganisms in wet conditions, .wet		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			mount method and hanging drop method. **i. Wet mount method:** It is the most widely used method. A drop of fluid containing micro organism to be examined is put on a glass slide and a cover slip made of thin glass is placed on it. The fluid spreads out in a thin layer between cover slip and slide. The mount is now examined under the microscope. For higher magnifications (e.g., with 100 x objective) Oil-immersion technique is employed. A drop of immersion oil is put between the objective lens and cover slip before the microorganisms are examined under the microscope.		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			ii. Hanging drop method: It is used to observe the motility germination or fission of microorganisms. In this method a cavity slide, which has a circular concavity in the centre, is used. The periphery of the concavity on the cavity slide is smeared with Vaseline. A drop of liquid microbial culture is placed in the centre of the cover glass if it is a liquid culture. If the culture is solid, it is mixed with a drop of distilled water before placing on the cover glass. The cover glass is inverted over the concavity so that the drop hangs freely and the edge of cover glass adheres tightly to the Vaseline coated periphery of the concavity. The		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			microorganisms present in the hanging drop are now observed under the microscope. **Dry and fix method:** Microorganisms, particularly bacteria, being too small need their permanent preparations be made by drying and fixing them on clean slide with or without staining. For preparing a dry mount, a drop of distilled water with a small amount of culture is spread as a thin smear on a clean slide. The smear is allowed to dry and it is then 'fixed' by passing it through a flame two to three times with the smeared slide away from the flame. If desired, this dried and fixed amount may be stained and the pre-paration dried again for observation under the		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			microscope. **c. Measurement of the size Microbes / Objects by Compound Microscope (Micrometry):** The size of objects viewed under the compound microscope can be accurately determined using a micrometer. The latter consists of two scales, the eyepiece scale, also called 'graticule' or 'occlar', and the stage micrometer scale. The eyepiece scale is calibrated with the help of stage micrometer and the former is then used for measurements. The eyepiece scale is placed inside the microscope eye piece, and the stage micrometer on the microscope stage. The scale on the latter is exactly 1 mm long and divided into 100 divisions,		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			so that each division is 10 μm. As stated earlier, the stage micrometer is used to calibrate the eyepiece scale. **i. Calibration :** □ It is noted first that which objective lens is in use on the microscope. □ Stage micrometer is positioned in such a way that it is in the field of view. □ The eyepiece is rotated so that the two scales are parallel. The stage micrometer is now moved so that the first division marks of the two scales are in line. One		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			can now see how many divisions on the eyepiece scale as well as on the stage micrometer scale correspond to each other. Since 1 division on the stage micrometer equals 10 µm, one can find the value of one division of the eyepiece scale. For instance, in illustration 'iii' of fig.4 four divisions on the eyepiece scale, equal 10 division (i.e., 100µm) of the stage micrometer scale; 1 division on the eyepiece Scale=25µm for the particular objective lens used in this case. □ Above positions are repeated using other objective lenses and following information are recorded on an adhesive label. Information recorded adhesive label is stuck to the base of the		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			microscope for future reference: Objective One division of Lens eyepiece scale (µm) 10 X - 15 X - 40 X - and so on **ii. Use:**		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			Having calibrated the eyepiece scale for all the objective lenses on the microscope, one can use it to measure the dimensions of cellular and sub cellular structures e.g., bacterial cells, fungal spores, onion epidermal cells etc		
3.		To describe the phase contrast microscope.	**Phase Contrast Microscope:** This microscope is a little more complicated to explain, but one may think of it as acting in the following fashion, as illustrated in Light coming: through screen (grating) A continues in a straight line, on through screen (grating) B. But if in the region C it should pass, through material of a different density, it would be bent and would not	T: explains with power presentation. S: listens and take notes.	Describe the phase contrast microscope.

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			pass straight on through, but it would hit the upper screen B or reinforce another ray. Thus, wherever there was a change in density - a cell wall, a membrane, or a granule - one could see different light intensities in the eyepiece. In this way one can see structures within living cells not otherwise visible. The screens A and B may be put into an ordinary microscope to convert it into a phase contrast microscope. Although phase contrast microscopes cause a slight loss of resolution, yet, they enable us to view living cells more.		
4.		To describe ultra- violet (UV)	**Ultra-violet (UV) Microscope:** As we know that the resolving power of a light	T: explains with power presentation.	To describe ultra- violet (UV) Microscope.

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
		Microscope.	microscope is related to the wavelength of the light used : Longer the wave length lowers the resolving power. Therefore, resolution can be improved by reducing the wavelength of the light. The UV microscopes have this advantage. However, since glass is opaque to ultraviolet light, the lens system must be made of appropriate quality quartz and the microscopes should have filters to eliminate ultraviolet light from reaching the eyes. Since this is complicated and expensive, a modification known as fluorescence microscopy has come into use. Fluorescence microscopy is based on the principle of fluorescence, in which certain chemicals absorb ultraviolet light and emit a part of	S: listens and take notes.	

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			the radiant energy as light of longer wavelength in the visible region. Thus, when the fluorescent object is exposed to ultraviolet light it is seen as a bright coloured object against a black background. In this type of microscopes, the ultraviolet irradiation is completely eliminated by suitable filters and it is possible to view the object directly. The major use of fluorescence microscopy in microbiology is in immuno fluorescence studies. The antibody can be made fluorescent by conjugating it with fluorescent chemicals. By fluorescence microscopy, it is possible to detect specific types of antigens using an antibody tagged with a fluorescent dye clearly.		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
5.		To describe electron microscope.	**Electron Microscope** EM has been invented by Knoll and Ruska (1932). The electron microscope works on the principle similar to that of a light microscope except that an electromagnetic field and *a* beam of electrons act in a way similar to the action of a glass lens and a beam of light. An electron beam when accelerated through an electric field of 100 KV has a wavelength of only 0.04nm which is about 10,000 times shorter than the wavelength of visible light. The resolving power and magnification of an electron microscope is therefore much higher than any light microscope. In an electron microscope, a beam of	T: explains with power presentation. S: listens and take notes.	Describe electron microscope

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			electrons is projected from a cathode (electron gun) and is passed through a series of electromagnetic lenses. The condenser lens collimates the electron beam on the specimen and an enlarged image is produced by a series of magnifying lenses. The specimens, who are focused, cannot be directly seen; their image is rendered visible by projection on a phosphorescent screen. Since the penetrating power of the electrons through solid matter is weak, only very thin sections of specimen can be examined. The electron microscopes produce a magnification up to 4,00,000 times. They require a high vacuum system as the motion of electrons is impeded by air. Also, the specimen to be examined must be dry.		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			Under these conditions (drying and vacuum) living organisms can not survive, and physiological processes in living cells can not be studied. The morphological characteristics of the cell are also altered. However, inrecent years special devised which permit observation		
6.		To describe acoustic microscope.	**Acoustic Microscope:** In 1949, a Russian Physicist S.Y. Sokolov proposed that the property of sound waves (sound waves travel as longitudinal. vibrations whose velocity depends on the elasticity and temperature of the medium) might be used for viewing intricate inside details of a solid body. However, the technology to convert sound signals into light	T: explains with power presentation. S: listens and take notes.	Describe acoustic microscope

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			signals did not exist at that time. Subsequently in the sixties, Professor G. Quate of U.S.A. and E.Ash of England developed this, principle and applied it in microscopy; the first practical microscope based on sound waves, namely, acoustic microscope, was commercialized in 1974. The principle on which the acoustic microscope works is based on, the fact that the speed of the sound in an environment is directly related to physical properties of that environment such as the density and elasticity. In acoustic microscope, the transmitted mode of the impinging sound wave by the specimen is captured and the vibration in intensity, due to various parts of the		

S.no.	Duration	Specific objectives	Content	Teaching learning activities	Evaluation
			specimen, is recorded. The inner surface of a solid, body is not accessible to optical light and only poorly to x-rays. With the use of proper electronics acoustic waves can do the job of revealing its inner structure easily. Moreover, the specimen need not be stained. The acoustic lens is a spherical surface ground into a material such as saphire through which sound travels		

Summary and Evaluation (10Min):

Today we had discussed the methods for study of microbe

Assignment: Describe the methods for the study of microbes.

Evaluation :

Bibliography:

1. Satish gupte, the short text book of Medical Microbiology, 9th ed., jaypee, pp 46.
2. Seema sood, Elsevier, microbiology for nurse, second edition, pp13-37.
3. IGNOU, BNS-102 applied sciences, Block 3rd microbiology-1,pp 26.

LESSON PLAN

Subject : Microbiology

Unit : II

Topic : **Methods for culture & isolation of microbes.**

Group : GNM Ist year

Place : CLASS ROOM

Date & time : ……

Teaching methods : Lecture cum discussion

AV aids : Black Board and chalk, LCD, Computer

Students Pre requisite : The students should be able to describe the methods for culture & isolation of microbes.

General Objectives : At the end of the class the students will be able to gain knowledge regarding the methods for culture & isolation of microbes.

Specific Objectives **:** At the end of the class the students will be able;-

1. To define culture media/ medium.
2. To describe the characteristic of an ideal culture media.
3. To describe the types of culture media.
4. To enlist the standard culture media
5. To describe the method of culture media & isolation of microbes.

Review of previous class :

Ask questions regarding suitable environment for bacterial growth.

Introduction:

Each microbe requires a particular environment to grow which is called suitable environment for it, so the culture media is a specified medium in which micro-organisms find nourishment & reproduce.

S.no	Duration	Specific objective	Content	Teaching learninng activity	Evaluation
1	5 min	To define culture media/ medium.	**Definitions:-** Culture media gives artificial environment simulating natural condition necessary for growth of bacteria. 1. energy source 2. carbon source 3. Nitrogen source 4. Salts 5. Satisfactory pH 6. Adequate water 7. Growth factor like tryotophan for salmonella typhi,	T: explains with power presentation. S: listens and take notes	Define culture media/ medium.
2	5 min	To describe	The characteristics of an ideal culture medium are:	T: explains	Describe the

S.no	Duration	Specific objective	Content	Teaching learninng activity	Evaluation
		the characteristic of an ideal culture media.	1 must give a satisfactory growth from single inoculums 2 should give rapid growth. 3 should be easy to grow 4 should be reasonably cheap. 5 should be easily reproducible. 6 should enable to demonstrate all characteristics in which we are interested.	with power presentation. S: listens and take notes	characteristic of an ideal culture media.
3	5 min	To describe the types of culture media.	**Types of culture media:-** 1 NATURAL MEDIUM 2 ARTIFICIAL MEDIUM 3 SYNTHETIC MEDIUM 4 NON SYNTHETIC MEDIUM 5 SOLID MEDIA	T: explains with power presentation. S: listens and take notes	Describe the types of culture media.

S.no	Duration	Specific objective	Content	Teaching learninng activity	Evaluation
			6 SEMI- SOLID MEDIA 7 DIFFERENT IAL MEDIA 8 DEHYDRATION MRDIA 9 SELECTIVE MEDIA		
4	10 min	To enlist the standard culture media	**Standard culture media:-** The method prepare culture media and the exact amount of ingredients necessary for the growth of bacteria will be demonstrated in the practical classes. **Nutrient broth:** beef extract +peptone crystals +sodium chloride + distilled water. **Nutrient agar:** nutrient broth +agar agar **Blood agar:** nutrient agar + blood **MacConkey agar:** sodium tourocholate + peptone crystals + lactose + sodium chloride	T: explains with power presentation. S: listens and take notes	Enlist the standard culture media

S.no	Duration	Specific objective	Content	Teaching learninng activity	Evaluation
5	25 min	To describe the method of culture media & isolation of microbes.	**Method of culture & isolation of microbes** **Methods of culture** 1 **Streak culture** (surface plating) is the method routinely employed for the isolation of bacteria in pure culture. a platinum loop with 2 1/2 " long wire and loop with diameter 2mm is charged with specimen to be culture and is placed on the surface of dried plate of solid media towards peripheral area . the plate in series of parallel lines in different segment of the plate . on incubation we may find confluent growth at the site of primary	T: explains with power presentation. S: listens and take notes	method of culture media & isolation of microbes.

S.no	Duration	Specific objective	Content	Teaching learninng activity	Evaluation
			inoculums. Well separated colonies are obtained over the final series of streaks. 2 **Lawn or carpet culture: -** Lawn cultures are prepared by flooding the surface or plate with suspension of bacteria .it is uniform for bacteriophage typing and antibiotic sensitivity test. **3 Stroke culture: -** it is made in tubes containing agar slopes. it is used for providing a pure growth of bacterium for slide agglutination **4 Stab culture: -** it is prepare by puncturing with charged long, straight wire. Stab cultures are employed mainly for maintaining stock culture.		

S.no	Duration	Specific objective	Content	Teaching learninng activity	Evaluation
			5 **Pure plate culture:-**15 ml of agar medium is melted and left to cool in water bath at 45degree to 50 degree C. appropriate dilution of inoculums is added in 1 ml volume to molten agar and mixed well. Content of tube is poured in Petri dish. It is allowed to set and after incubation colonies will be seen distributed throughout the depth of medium. This method gives viable bacteria count in a suspension. It is the recommended method for quantitative urine culture. 6 **Liquid culture:** - in a tube, bottle or flask may be inoculated by touching with a charged loop. Liquid cultures are preferred		

S.no	Duration	Specific objective	Content	Teaching learninng activity	Evaluation
			when large and quick yield is required. The major disadvantage of liquid culture is that it does not provided pure culture from mixed inocula. **Method of anaerobic culture:-** Obligate anaerobes grow only in absence of free oxygen. These bacteria lack mechanism of oxidation through respiratory enzymes like cytochrome oxidase, catalase and peroxidase resulting in H2O2 accumulation. This h2o2 is toxic for the growths of anaerobic bacteria .clostridium tetani are strictly anaerobic. A number of methods are described for achieving anaerobiosis on the basis of following principal: 1 Exclusion of oxygen.		

S.no	Duration	Specific objective	Content	Teaching learninng activity	Evaluation
			2 Production of vacuum. 3 Displacement of oxygen with other gases. 4 Absorption of oxygen by chemical or biological. 5 Reduction of oxygen.		

Summary and Evaluation (10 min);

Today we have discussed about the definition, characteristics and types of culture media & methods of culture.

- Define culture media
- Describe the types of culture media.
- Explain the methods of culture & isolation of microbes

Assignment:

Describe the types of culture media in detail.

Evaluation:

Unit test for 50 marks once the unit IInd is completed.

Bibliography:

1. Satish gupte, the short text book of Medical Microbiology, 9th ed., jaypee, pp 43-56.
2. R. Ananthanarayan, text book of microbiology, 5th ed., jaypee.pp33-43.
3. IGNOU, BNS-102 applied sciences, Block 3rd microbiology-1, pp 31-32.
4. C.P.,baveja,text book of microbiology,second edition2007,arya publication,pp24 to 27.

LESSON PLAN

Subject : Microbiology

Unit : III

Topic : **Sources & types of infection, nosocomial infection.**

Group : GNM I st year

Place : CLASS ROOM

Date & time : ……..

Teaching methods : Lecture cum discussion.

AV aids : Black Board and chalk, LCD, Computer

Students Pre requisite : The students should be able to define & describe the sources & types of infections.

General Objectives : At the end of the class the students will be able to define & describe the source &. types of infections

Specific Objectives **:** At the end of the class the students will be able to;-

1. Define infection.
2. To describe types of infection.
3. To describe the sources of infection.
4. Define nosocomial infection.
5. To enlist sources of nosocomial infection.
6. To describe the factors responsible for nosocomial infection.
7. To describe the prevention of nosocomial infection.

Review of previous class:

Ask to the students about microbes and the methods of culture.

Introduction:

We all knows that some of the habits are called best to maintain health such as hand washing, drink potable water, eat fresh foods, ect., because these habits prevents infection, so today we will discuss all about the infection.

S.no.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
1.	5 min	Define infection	**Definition: -** 'when pathogenic microorganisms enter & multiply in or on the bodies of animals or human being and produce a reaction, it is called an infection.' All infection do not result in a disease. Some infection are very mild and do not cause much discomfort while others may be fatal.	T: explains with power presentation. S: listens and take notes.	Define infection.
2.	5 min	To describe types of infection	**Types of infection:-** 1. Primary infection: initial infection with organisms in host constitutes primary infection. 2. Reinfection subsequent infection by same organisms in a host is called reinfection. 3. Secondary infection : when in a host whose resistance is lowered by preexisting	T: explains with power presentation. S: listens and take notes.	Describe types of infection.

S.no.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			infectious disease, a new organisms may set up an infection. 4. Cross infection: when a patient suffering from a disease and few infection is set up from another host or external source. 5. Focal infection: it is a condition where due to infection at localised sites like appendix and tonsil, general effects are produced. 6. Nosocomial infection: cross infection occurring in hospital is called nosocomial infection 7. Subclinical infection: it is one where clinical affected are not apparent.		
3.	15 min	To describe the sources of	**<u>Source of infection:</u>** 1. man: man is himself a common source of	T: explains with power	Describe the sources of

S.no.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
		infection	infection from a patient or carrier. Healthy carrier is a person harbouring pathogenic organisms without causing any disease to him. A convalescent carrier is one who has recovered from disease but continues to harbour the pathogen in his body. 2. Animals: infectious disease transmitted from animals to man are called zoonosis may be bacterial (e.g., plague from rat), rickettsial (e.g., murine typhus from rodent), viral(e.g., rabies from dog), protozoal (e.g.,leishmanisha from doges) , helminthic (e.g. hydatid,cyst from dog), and fungal (zoophilic dermatophytes from cats and	presentation. S: listens and take notes.	infection.

S.no.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			doges), 3. insect: the disease caused by insect are called arthropod born disease insect like mosquitoes, fleas, lice, that transmit infection are called vector. Transmission may be mechanical (transmission of dysentery or thyphoid bacilli by house fly), and these are called mechanical vector. They are called biological vector if pathogen multiplies in the body of vector e.g., malaria 4. some vector may act as reservoir host e.g., ticks in relapsing fever and spotted fever 5. soil: soil may serve of parasiting infection like round worm hook worm. Spores of		

S.no.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			tetanus bacilli remain viable in soil from a long time , fungi like histoplasma capsulatum and higher bacteria like no cardia asteroid also survive in soil and cause human infection. 6. water: vibrio cholera, infective hep. virus (Hep. A), guinea worm may be found in water. 7. food: contaminated food may be source of infection. Presence of pathogen food may be due to external contamination(food poisoning),		
4.	5 min	Define nosocomial infection.	**<u>Nosocomial infection:-</u>** 'Infection which are acquired from hospitals are called nosocomial infections.'	T: explains with power presentation.	Define nosocomial infection.

S.no.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
				S: listens and take notes.	
5.	5 min	To enlist sources of nosocomial infection.	**Source of hospital infection** □ Infection microorganisms from fellow patient which may be multidrug resistant. □ Infection organisms from hospital staff. □ Infection organisms from instrument, blood products, intravenous fluid, etc □ From patients normal flora.etc. □ Insects are also source multidrug infection. □ Organisms may be present in air, dust, water, antiseptic solution, food, etc. □ Surfaces contaminated by patient secretions, blood fluid, etc.	T: explains with power presentation. S: listens and take notes.	Enlist sources of nosocomial infection.

S.no.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
			Factor responcibal for hospital infection		
6.	10 min	To describe the factors responsible for nosocomial infection.	□ Neonates and aged patient have risk of getting hospital infection because of long stay and decreased immunity. □ Impaired defence mechanisms of patients due to disease or treatment. □ Hospital environment contains relatively heavy load of microorganisms. □ Major invasive diagnostic or therapy procedures. □ Advance treatment of cancer, organ transplantation, etc. □ Presence of multidrug resistant bacteria, etc.	T: explains with power presentation. S: listens and take notes.	Describe the factors responsible for nosocomial infection.
7.	5 min	To describe the prevention of nosocomial	**Prevention of nosocomial infection** □ Proper washing of hands. □ Isolation of patient, e.g., plague, influenza,	T: explains with power presentation.	Describe the prevention of nosocomial

S.no.	Duration	Specific objectives	Content	Teaching learning activity	Evaluation
		infection.	measles, etc. Careful and appropriate use of instruments. Use of antibiotic only if required. It may be given to carrier staff or patient. Use of blood transfusion only if must.. Surveillance of infection properly and regularly. Use of vaccine, e.g. tetany gas gangrene, hepatitis- Disinfection of excreta and infection material.	S: listens and take notes	infection.

Summary: and Evaluation (10Min)

Today we had discussed the definition, types, sources, prevention& all about nosocomial infection.

- Define infection, enlist the types of infection.
- Describe the source of infection.
- Explain the prevention of infection.

Assignment: Define infection, describe the source & prevention of nosocomial infection.

Evaluation:

Unit test for 50 marks once the unit IIIrd is completed.

Bibliography:

1. Satish gupte, the short text book of Medical Microbiology, 9th ed., jaypee, pp 64-66.
2. R. Ananthanarayan, text book of microbiology, 5th ed., jaypee.pp59-64; 583-585.
3. Seema sood, Elsevier, microbiology for nurse, second edition, pp46-59.
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LESSON PLAN

Subject : Microbiology

Unit : III

Topic : **Factors affecting growth of microbes.**

Group : GNM I st year

Place : CLASS ROOM

Date & time : ……..

Teaching methods : Lecture cum discussion.

AV aids : Black Board and chalk, LCD, Computer

Students Pre requisite : The students should be able to introduce nutritional requirement & factors affecting the growth of microbes.

General Objectives : At the end of the class the students will be able to describe the factors affecting growth of microbes.

Specific objective **:** At the end of the class the students will be able;-

1. To introduce the growth of microbes.
2. To describe the nutritional requirement for the growth of bacteria.
3. To describe factors influencing the growth of bacteria.

Introduction:

You all know that every living- being requires some factors for its growth, same as it the microbes requires some factors for growth and we can control growth of microbes by control on these factors.

S.no.	Duration	Specific objective	Content	Teaching learning activity	Evaluation
1.	5 min	To introduce the growth of microbes.	**Introduction :-** like all other living forms, bacteria require suitable nutrients in proper amounts , as well as favourable environment for their growth, maintenances and multiplication. They require nitrogen, energy food (sugar, starch, etc.), some minerals, abundance of water, optimum temperature and proper pH for their growth. Different kinds if bacteria can be artificially and they vary in their nutritional requirements.	T: explains with power presentation. S: listens and take notes.	Introduce the growth of microbes.
2.	5 min	To describe the nutritional requirement	**Nutritional requiremments for the growth of bacteria** The bacteria require following nutrients for their	T: explains with power presentation.	Describe the nutritional requirement for

S.no.	Duration	Specific objective	Content	Teaching learning activity	Evaluation
		for the growth of bacteria.	growth: 1. Protein or peptones or other nitrogen containing substance 2. Energy foods such as sugar, starch, beef extract, etc. 3. Minerals in small amount 4. Water in large amount 5. Accessory growth substances, such as blood , glucose, vitamins etc.	S: listens and take notes.	the growth of bacteria.
3.	40 min	To describe factors influencing the growth of bacteria.	**FACTORS INFLUENCING THE GROWTH OF BACTERIA :-** Bacteria are literally at the mercy environment. Slight change in the environment affects the growth of bacteria. The spore forming types are the only	T: explains with power presentation. S: listens and take notes.	Describe factors influencing the growth of bacteria.

S.no.	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			kinds that have protection against unfavourable condition. By controlling the environment factors, we can stimulate bacteria to grow or stop their growth or destroy them as we wish. **<u>Factors which affect the bacteria growth are</u>**:- 1. **MOISTURE:** All bacteria need an abundance of water for their growth, which is as essential as nourishing food. In fact, bacteria cannot be nourished without water because food element must be in solution before they can be absorbed through the cell wall and cytoplasmic membranes of the organisms. All kinds of bacteria grow best in an aqueous		

S.no.	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			medium. A total lack of moisture prevents their growth or destroys them. 2. **LIGHT:** Bacteria differ sharply from green plants in their reaction to light. In green plants chlorophyll helps to nourish the plant in the presence of sunlight and even their growth is aided,, by sunlight . Bacteria expect photosynthetic have no chlorophyll, most of the bacteria are injured or even killed in a few hours by direct sunlight. It is the ultraviolet rays in sunlight which destroy bacteria. **3. TEMPERATURE:** Different types of bacteria need different optimum temperature for their growth. The optimum temperature for the growth of most		

S.no.	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			pathogenic bacteria which grow in the human body is 37 degree c. Types of bacteria with relation of temperature there are :- 1 psychrophilic: These are the organisms growing between 0degree and 25 degree c. They are mostly soil and water bacteria. 2 mesophilic: they grow between 20 degree and 44 degree c. this group includes bacteria producing disease. 3 thermophilic : some organisms grow between 50 degree and 60 degree c. e.g., bacillus and algae and upper range of temperature tolerated by them correlates well with the thermal stability of the species protein as measured in cell extract.		

S.no.	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			4. **OSMOTIC PRESSURES:** Bacteria are usually resistance to changes of osmotic pressure. However, 0.5 percent sodium chloride is added to almost all culture media to make environment isotonic. 5. **MECHANICAL AND SONIC STRESS:** Bacteria have tough cell walls. Vigorous shaking with glass beads, grinding and exposure to ultrasonic vibration may cause rupture or disintegration of cell wall. 6. **OXYGEN:** oxygen also plays a very important part in the life of bacteria a. Aerobes:- bacteria grow only in the		

S.no.	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			presence of oxygen b. Anaerobes:- bacteria grow only in the absence of oxygen 7. **RADIATIONS:** Bacteria are very sensitive to ultraviolet and other radiations. Various kinds of special lamps which produce ultraviolet rays are used in the treatment of skin infection. X-rays, alpha, beta, and gamma rays are fatal to bacteria. 8. **SOUND WAVES:** Many sounds waves audible to the human ear have no affect on bacteria. However, rapid sound waves or vigorous shaking can disintegrate bacteria. If cultures are subjected to certain very rapid supersonic or ultrasonic vibrations, many microbes are entirely disrupted.		

Summary and Evaluation (10Min)

Today we had discussed the introduction, nutritional requirement & factors influencing the growth of bacteria.

- Introduce the growth of microbes.
- Describe the factors influencing the growth of microbes.

Assignment : Describe the nutritional requirement for the growth of microbes & factors influencing the growth of microbes.

Evaluation : Unit test for 50 marks once the unit IIIrd is completed

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1. Satish gupte, the short text book of Medical Microbiology, 9th ed., jaypee, pp 34-39.
2. IGNOU, BNS-102 applied sciences, Block 3rd microbiology-1,pp 29-31.
3. C.P.,baveja,text book of microbiology,second edition2005,arya publication,pp22-26.

LESSON PLAN

Subject : Microbiology

Unit : III

Topic : **Cycle of transmission of infection, portals of entry, exits, modes of transfer.**

Group : GNM I st year

Place : CLASS ROOM

Date & time : ……..

Teaching methods : Lecture cum discussion.

AV aids : Black Board, chalk, LCD, Computer

Students Pre requisite : The students should be able to describe cycle of transmission of infection portals of entry, exits, modes of transfer.

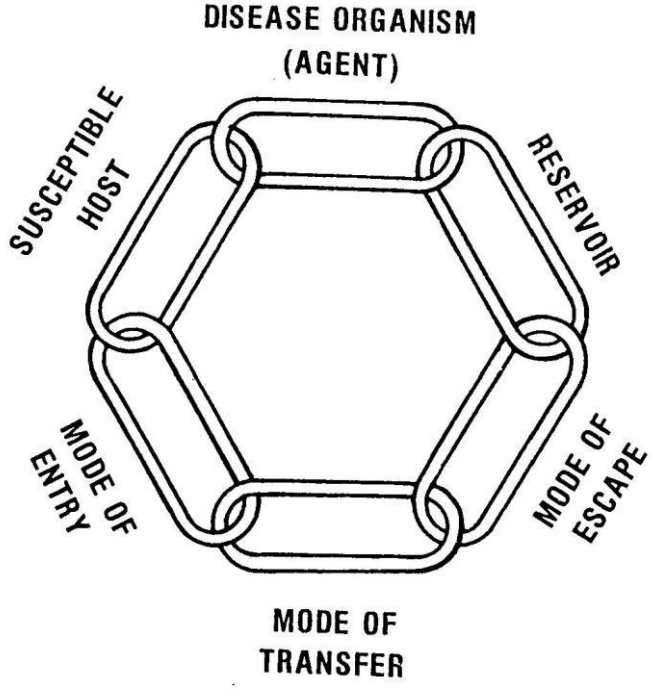
General Objectives : At the end of the class the students will be able to gain knowledge regarding the cycle of transmission of infection, portals of entry, exits, modes of transfer .

Specific Objectives: At the end of the class the students will be able:-

1. To describe the cycle of transmission of infection.
2. To describe the portals of entry.
3. To describe the portals of exits.
4. To explain the transmission of infection.

Introduction: every microbe has an ability to growth in a suitable environment, then they multiply & infection is spread. Today we will discuss about cycle of transmission of infection, portals of entry, exits, modes of transfer .

S.no.	Duration	Specific objective	Content	Teaching learning activity	Evaluation
1.	15 min	To describe the cycle of transmission of infection	**Cycle of transmission of infection:-** In order to provide proper care for patients with communicable diseases or infectious organisms, you should understand the components of infection and the methods to control the cycle of infection. The cycle of infection is like a chain consisting of six links. To produce disease, each link of the infectious process must be present in a logical sequence. Removing one link in the chain will control the cycle of infection. The six links are discussed in the following paragraphs.	T: explains with power presentation. S: listens and take notes.	Describe the cycle of transmission of infection.

S.no.	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			 Figure 1. The cycle of infection. a. **Infectious Microorganisms (Agent).** These are the		

S.no.	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			pathogens that cause communicable diseases. b. **Reservoir.** The reservoir (source) is the person or animal that has the disease. Sometimes a person may have a disease but is not ill. This type of person is called a carrier. c. **Mode of Exit.** This refers to the route by which the infectious microorganisms escape the reservoir. It may be through respiratory tract, digestive tract, genitourinary tract, cut in the skin etc. d. **Vector.** The vector is the connection between the source of the disease (reservoir) and the person who is going to catch the disease (host). The vector is sometimes referred to as the "vehicle of disease transmission.		

S.no.	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			e. **Mode of Entry.** The mode of entry refers to the method by which the pathogens enter the person (host). For example, some pathogens are inhaled (respiratory tract). f. **Susceptible Host.** The host is the person who gets the disease. Once the host has the disease, he becomes a reservoir for future transmission of the disease.		
2.	10 min	To describe the portals of entry.	**<u>Portals of entry (entery of microbes into the body)</u>** The pathogen must enter the body through certain routes or pathway called the portals of entry. The portal of entry differs for the various organisms, and most of these can cause infection only if they enter through their own particular route. Infection enters the body through one of the following	T: explains with power presentation. S: listens and take notes.	Describe the portals of entry.

S.no.	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			ways 1. **The alimentary tract:** the alimentary canal is the portal of entry for the germs causing typhoid, dysentery and cholera disease. Germs of clostridium botulinum produce toxin, which causes severe food poisoning and may be even fatal. 2. **The respiratory tract:** the respiratory tract is the portal of entry of the germs causing diphtheria, tuberculosis, pneumonia, etc. These organisms have a special affinity for the respiratory tract and cause infection in bronchi and lungs. 3. **The urogenital tract:** some organisms enter the body by coming with the urogenital tract,		

S.no.	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			e.g. gonorrhoea, syphilis and AIDS. **Inoculation:** some organism enter the body through the skin or mucous membrane and cause infection ranging from a boil to server wound infections. tetanus spore enter through wound. Serum hepatitis is transmitted by transfusion of contaminated blood or inoculation of material containing virus		
3.	10 min	To describe the portals of exits.	**Portals of exit (exit of microbes from the body of infected persons or carriers)** The pathogen exit from the body through certain pathways, called the portals of exit. The portal of exit differs for the various organisms and depends upon the affected part of the body. The germs of	T: explains with power presentation. S: listens and take notes.	Describe the portals of exits.

S.no.	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			intestinal disease exit through the faeces or urine; whereas the germs causing infection of respiratory tract exit through the sputum, saliva or nasal secretion. Microbes exit the body through one of the following ways 1. **Faeces:** organisms of typhoid fever, paratyphoid fever, dysentery, cholera, diarrhoea, anthrax, small pox, exit through the faeces. 2. **Urine:** organisms of typhoid fever, paratyphoid, tuberculosis ,exit through urine. 3. **Sputum / saliva:** organisms of tuberculosis, pneumonia, rabies, whooping cough exit through sputum/ saliva.		

S.no.	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			4. **skin & mucous membrane:** organisms of small pox, chicken pox, measles, leprosy, syphilis, gonorrhoea exit through the secretions of skin and mucous membrane. 5. **Secretions (nose and throat):** organisms of diphtheria, whooping cough, mumps, chicken pox, small pox, measles, syphilis, polio, tuberculosis, epidemic meningitis, 6. **Secretion from the eyes:** organisms of trachoma and conjunctivitis exit through the secretion of eyes. 7. **Blood:** germs are carried away by the arthropods also. examples malaria, filarial, dengue fever by mosquitoes; plague by fleas; typhus by louse and flea.		

Summary and Evaluation (10Min)

Today we have discussed about the cycle of transmission of infection portals of entry, exits, and modes of transfer.

- Describe the cycle of transmission of infection.
- Describe the portals of entry.
- Describe the portals of exits.
- Explain the transmission of infection.

Assignment: Describe the cycle of transmission of infection in detail?

Evaluation: Unit test for 50 marks once the unit IIIrd is completed.

Bibliography:

1. Satish gupte, the short text book of Medical Microbiology, 9th ed., jaypee, pp 64,471.
2. R. Ananthanarayan, text book of microbiology, 5th ed., jaypee.pp59-64,583-585.
3. Seema sood, Elsevier, microbiology for nurse, second edition, pp46-59.
4. IGNOU, BNS-102 applied sciences, Block 3rd microbiology-1,pp 83-86.
5. C.P.,baveja,text book of microbiology,second edition2005,arya publication,pp 591-595.

LESSON PLAN

Subject : Microbiology

Unit : III

Topic : **Reaction of body to infection, mechanism of resistance ,and collection of specimen.**

Group : GNM I st year

Place : CLASS ROOM

Date & time : ……..

Teaching methods : Lecture cum discussion.

Students Pre requisite : The students should be able to introduce and describe the history of microbiology.

General Objectives : At the end of the class the students will be able to gain knowledge regarding Reaction of body to infection, mechanism of resistance ,and collection of specimen.

Specific Objectives**:** At the end of the class the students will be able :-

1. To Describe the steps of reaction of body to infection
2. To explain mechanism of resistance.
3. To define specimen
4. To describe various types of specimen collection.

Review of previous class: Describe the cycle of transmission of infection.Enlist the mode of transfer of infection.

Introduction:

In our daily routine we see that when we feel sick the some of sign are present as fever, inflammation, etc. This is the sign of the body defens against the pathogens to prevent disease & by certain investigations we diagnose disease and identify the causative organism, so today we will discuss all about the reaction of the body to infection, mechanism of resistance and collection of specimens.

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evalaution
1	10 min	To Describe the steps of reaction of body to infection.	**Inflammation:**-Any injury, including an invasion by microorganisms, causes inflammation in the affected area.. The damaged tissue releases substances that direct the immune system to do the following: Wall off the area Attack and kill any invaders Dispose of dead and damaged tissue Begin the process of repair During inflammation, the blood supply increases. An infected area near the surface of the body becomes red and warm. The walls of blood vessels become more porous, allowing fluid and	T: explains with power presentation. S: listens and take notes.	Describe the steps of reaction of body to infection

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evalaution
			white blood cells to pass into the affected tissue. The increase in fluid causes the inflamed tissue to swell. The white blood cells attack the invading microorganisms and release substances that continue the process of inflammation. Other substances trigger clotting in the tiny vessels (capillaries) in the inflamed area, which delays the spread of the infecting microorganisms and their toxins. Many of the substances produced during inflammation stimulate the nerves, causing pain. Reactions to the substances released during inflammation include the chills, fever, and muscle aches that commonly accompany infection. **Immune Response**		

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evalaution
			immune system produces antibodies that target the specific invading microorganism. **Fever** Body temperature increases as a protective response to infection and injury.		
2.	5 min	To explain mechanism of resistance	**<u>Host Resistance</u>** Numerous physical and chemical attributes of the host protect against bacterial infection. These defences include the antibacterial factors in secretions covering mucosal surfaces and rapid rate of replacement of skin and mucosal epithelial cells. Bacteria invading tissues encounter phagocytic cells that recognize them as foreign,	T: explains with power presentation. S: listens and take notes.	Explain mechanism of resistance

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evalaution
			and through a complex signalling mechanism involving interleukins, eicosanoids, and complement, mediate an inflammatory response in which many lymphoid cells participate.		
3.	5 min	To define specimen	The word specimen is derived from Latin word 'spec ere' means to look. Definition:- A part of something ,intended to show the kind, quality, & other characteristics of the whole.	T: explains with power presentation. S: listens and take notes.	Define specimen
4.	5 min	To describe role of nurse in specimen collection.	**<u>Nurses' Roles in Specimen Collection:-</u>** 1.All Specimen must be labelled with the patient name and age, date and time of sampling name of ward nature of specimen ,the clinical diagno-	T: explains with power presentation. S: listens and	Describe role of nurse in specimen collection.

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evalaution
			sis, duration of illness, the examination required, and antimicrobial treatment taken etc. 2. whenever possible specimen shuld be collected before antimicrobial agent have been administered 3. Avoid contamination by using aseptic techniques 4.tissue or fluied submitted for culter always superior to material material on swab. 5. Specimen should be of sufficient quantity to permit complete examinations. 6. Follow standard precaution.	take notes.	

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evalaution
5.	25 min	To describe procedure of all type of specimen collection.	**1. Throat Swab Culture** A sample of mucus and secretions from the back of the throat is collected on a cotton-tipped applicator and applied to a slide or a special cup that allows infections to grow. The tongue should be depressed. And both tonsils are swabbed. Contamination to other side is avoided. **2. Sputum Specimen and Culture** A specimen from the lungs expectorated through the mouth or obtained via tracheal suctioning with an in-line trap or bronchoscope. Specimens are often taken for three consecutive days be-	T: explains with power presentation. S: listens and take notes.	Explain about throat swab culture? Explain about urine sampling?

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evalaution
			cause it is difficult for the patient to cough up enough sputum at one time, and an organism may be missed if only one culture is done. Morning sample is preferred. To prepare your patient, have him drink enough fluids on the night before the test, provided that he's not on a fluid restriction. The additional intake will further increase sputum production overnight and assure that you'll get a good sample. Ten to 15 ml of sputum is typically needed for laboratory analysis.. **3. <u>Stool Specimen and Culture</u>**		

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evalaution
			A stool culture is the process of growing or culturing organisms existing in feces to see. Stools specimen is often tested for blood. Plastic bag for transport of container with specimen to laboratory Bedpan should be provided when the patient is ready. Avoid mixing urine or regular toilet paper into the sample. With the use of a tongue blade, transfer a portion of the feces to the specimen container. Immediately cover the container and label it . Take the specimen to the lab immediately; examination for parasites, ova, and organisms must be made		

S.no	Duration	Specific objec-tives	Content	Teaching learning ac-tivity	Evalaution
			while the stool is warm. **4. <u>Urine Specimen and Culture</u>** 4.1. Random Urine Sample A sample of urine collected at any time of the day. Instruct the patient to use the cotton ball or towelette to clean urethral area thoroughly to prevent external bacteria from entering the spec-imen. Let the patient void into the container. Label the specimen container with patient identi-fying information, and send to the lab immediately		

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evalaution
			4.2. Midstream “Clean-Catch” Urine Specimen Midstream “clean-catch” urine collection is the most common method of obtaining urine specimens from adults. Explain to the patient that this kind of urine collection involves first voiding approximately one half of the urine into the toilet, urinal, or bedpan, then collecting a portion of midstream urine in a sterile container, and allowing the rest to be pass into the toilet		

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evalaution
			4.3. Timed Urine Specimens (2-Hour, 4-Hour, 24-Hour) For many urine chemistry procedures the specimen of choice is 24-hour urine. A 24-hour urine collection is performed by collecting a person's urine in a special container over a 24-hour period **5. <u>Blood Cultures</u>** Supplies and Equipment Two blood culture bottles (one for anaerobic and one for aerobic specimens) Draw at least 10 cc of blood from the patient (5 cc is needed for each bottle). Inject 5 cc of blood into the anaerobic bottle, not		

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evalaution
			allowing air to enter the bottle. Replace the needle on the syringe with another sterile needle. Inject the remaining 5 cc of blood into the aerobic bottle and while the needle is still in the bottle, disconnect it from the syringe so that air enters the aerobic bottle. Gently mix the blood with the solution in both bottles. Label both bottles with the patient's identifying information and the type of culture that is, aerobic or anaerobic. Fill out the laboratory request form completely		

S.no	Duration	Specific objectives	Content	Teaching learning activity	Evalaution
			and send the specimens to the laboratory immediately.		

Summary and Evaluation(10 min):

Today we have discussed about the reaction of body to infection, mechanism of resistance & collection of specimen.

Assignment:

Describe the types collection of specimen & role of nurse during collection of specimen.

Evaluation:

Unit test for 50 marks once the unit IIIrd is completed.

Bibliography:

1. R. Ananthanarayan, text book of microbiology, 5th ed., jaypee.pp85-100.
2. Seema sood, Elsevier, microbiology for nurse, second edition, pp38-46.
3. C.P.,baveja,text book of microbiology,second edition2005,arya publication,pp104-119.

LESSON PLAN

Subject : Bioscience & Microbiology
Unit : IV
Topic : **Immunity And Immunization schedule**
Group : GNM 1st year
Place : CLASSROOM
Date & Time : …….
Teaching Method : Lecture cum discussion method
AV aids : Black board & chalk
Students Pre requisite : -The student should be able to know about 6 killer diseases for vaccination and

Specific Objectives :

1.To define immunity.
2.To list all the type of immunity

General objectives : - At the end of the class the student will be able to gain knowledge regarding immunity&Immunization schedule

Introduction : : - Ask the students If they know about Vaccination (0-5 years children) for 6 killer diseases

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
1.	5 min	To define immunity	**Immunity;-** The ability to resist infection by an invading pathogen. The body quickly launches an immune response and prevents the symptoms of disease occurring.	T:- Lecture cum discussion with black board	Q:What is Immunity?
2.	10 min.	To list all the type of immunity	**Types Of Immunity:-** 1. Innate Immunity • Species • Racial • Individual 2. Acquired Immunity (a) Active	S:- Listens and takes notes T: Explain with power point	Q: List all types of immunity

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
			• Natural • Artificial (b) Passive • Natural & Artificial	presentation S:Listens, observe and takes notes	
3.	15min.	To explain the innate immunity with different types	**INNATE IMMUNITY:-** It is the resistance which individual possesses by birth. It is by virtue of his genetic And constitutional make-up. • It may be non-specific, when there is resistance to infections in general. • Specific when resistance to particular pathogen is concerned.	T:- Teach innate immunity with examples with power point presentatio	Q: Describe the Innate immunity with its type.

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
			<u>Species Immunity</u>:- It refers to the total or relative refractoriness to a pathogen shown by all members of a species. For example- all human being are totally insusceptible to plant pathogen. **<u>Racial Immunity:-</u>** Different races may show differences in susceptibility to infections this is known as racial immunity For example: - High resistance of algerian sheep to	n S:- Learn adequately with example and takes notes	

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
4.	20min.		anthrax. **<u>Individual Immunity:-</u>** Different individual in a race differences in innate immunity exhibited is known as individual immunity For example: - the genetic basis of individual immunity is differ homozygous it means exhibit similar degree of resistance to Tuberculosis such co-relation is not seen in heterozygous twins. **2. <u>ACQUIRED IMMUNITY:-</u>** This is the immunity which man acquired as a result of :-		Q:- Explain

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
		To explain the type of acquired immunity with example	(1) Infection- clinical or subclinical .the immunity so obtained is often life-long, For example as in measles. (2) And the administration of antisera and vaccines. **Two Types:-** (a)**<u>Active acquire immunity</u>:-** It is the resistance developed by an individual as a result of an antigenic stimulus. • <u>Natural active acquired immunity</u>:- This immunity results from either a clinical or inapparent infection by a parasite. A person who has recovered from	T:- Lecture cum discussion with using chart S:- Listens and takes notes	each type of acquired immunity .

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
			an attack of measles develops natural active immunity • Artificial acquired active immunity:- It is the resistance induced by vaccines. Examples bacterial vaccine:- BCG , typhoid, DPT Viral Vaccine :- Polio, hepatitis -B **(b) Passive acquired Immunity:-** The resistance that is transmitted to a recipient in a 'readymade' form is known as passive immunity. • Natural Passive acquired Immunity:-		

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
			is the resistance passively transferred from the mother to the baby the maternal antibodies are transmitted predominantly through the placenta. • <u>Artificial passive acquired Immunity:-</u> Is the resistance passively transferred to recipient by administration of antibodies The agents used for this purpose are hyper immune sera of animal or human origin. Example:- human gamaglobulin Is also used in the treatment of patient with		

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
5.	10 min.	To explain miscellaneous	some immuno deficiencies **MISCELLANEOUS IMMUNITY:-** • **Herd Immunity:-** This refers to the overall level of immunity in a community and is relevant in the control of epidemic disease is known as 'Herd Immunity' • **Combined Immunization:-** A combination of active and passive immunization is employed simultaneously which is known as combined immunization	T:- Lecture cum discussion.	Q:Explain the Miscellaneous immunity

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
		immunity	• **<u>Adoptive Immunity:-</u>** Injection of immunologically competent lymphocytes is known as adoptive immunity • **<u>Local immunity:-</u>** Natural injection or the live viral vaccine administered orally or intranasally provides, local immunity at the site of the entry such as gut mucosa and nasal mucosa respectively.	S:-Listens and takes notes	
6	5 min		**Immunization schedule in India 2016**		Q:Draw the

<table>
<tr><th>S.No</th><th>Duration</th><th>Specific Objective</th><th>Content</th><th>Teaching Learning Activity</th><th>Evaluation</th></tr>
<tr><td></td><td></td><td>To Draw the immunization schedule</td><td>
<table>
<tr><th>Group</th><th>Vaccine</th><th>Time</th><th>Route</th><th>Dose</th></tr>
<tr><td>1) For pregnant women</td><td>T.T- I

T.T 2nd</td><td>At the time of Ist ANC visit

After 4 weeks of T.T</td><td>I.M

I.M</td><td>0.5 ml

0.5 ml</td></tr>
</table>
</td><td>T:Explain with power point presentation
S: Listen and takes notes</td><td>immunization schedule</td></tr>
</table>

S.No	Duration	Specific Objective	Content					Teaching Learning Activity	Evaluation
					Ist				
			2) For Infant	BCG OPV- 0 Hepatitis B	At Birth	ID Oral I.M	0.05ml 2drops 0.5ml		
				OPV Ist Pentavelant - Ist	6wks 6wks	Oral I.M.	2drops 0.5 ml		
				OPV 2nd	10wk	Oral	2drops		

S.No	Duration	Specific Objective	Content					Teaching Learning Activity	Evaluation
					s				
				Pentavelant - 2nd	10wk s	I.M.	0.5 ml		
				OPV 3rd	14wk s	Oral	2drops		
				Pentavelant - 3rd	14wk s	I.M.	0.5 ml		
				Measles	9 month	SC	0.5 ml		
				Vitamin A	9	Oral	1 lac		

S.No	Duration	Specific Objective	Content					Teaching Learning Activity	Evaluation
					month		I.U.			
			3For Children	DPT booster Polio booster Measles II Vitamin A	16-24month 16-24 month 16-24 month 16-24 month	I.M Oral SC Oral	0.5ml 2 drops 0.5 ml 2 lac I.U.			

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
			than after every six month 2 lac I.U upto the age of 5 yrs(To		

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation

	DPT Booster	5-6 years	I.M	tal 9 dose) 0.5ml

Summary:

1. List various types of immunity
2. Explain the type acquired immunity (Ask to four students)
3. What are the difference between innate and miscellaneous immunity

Assignment:

List the various type of acquired immunity

Evaluation:

Unit Test for 50 mark once the unit IV is completed

Bibliography:

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2. Text book of Microbiology ,Author – R.Ananthanarayan & C.K.Jayaram paniker, Fifth edition, Page no. 65 -73
3. Text book of microbiology For nurses , Author – Seema sood, Second Edition , Published By Elsevier, Page no. 132 -145.
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LESSON PLAN

Subject **:** Bio science & Microbiology

Unit : IV

Topic : **Vaccination (Immune prophylaxis)**

Group : GNM Ist Year

Place : CLASSROOM

Date & Time : ……..

Teaching Method : Lecture Method

AV aids : Black Board & Chalk with Projector

Students Pre requisite : The Students should be able to know about six killer diseases and related vaccines.

General objectives : At the end of the Class students will be able to gain knowledge regarding vaccination.

Specific Objectives:

1. To define vaccines
2. To list type of vaccines
3. To explain BCG vaccination (route, site, contra-indication)
4. To discuss about polio vaccination
5. To discuss DPT vaccination
6. To explain Measles vaccination

Introduction:

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
1.	3min	To define vaccines	**<u>Vaccines</u>** Vaccines are immune biological substances which produce specific protection against a give disease.	T:- Explain with Power point presentation S:- Listen carefully and take notes	Q: What is vaccines
2	5 mins.	To list type of vaccines	**Live attenuated vaccines** Bacterial – BCG ,typhoid, Plague Viral-Oral polio, measles, mumps , rubella ,influenza **Killed vacciens** Bacterial – Pertusis , cholera, meningitis Viral-Rabies, hepatitis B , **Toxied** DPT,MMR ,DT ,HEP.B	Q: Explain with Power point and charts S: Listens and takes notes	Q:- List all types of vaccines

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
3.	7 mins	To explain BCG vaccination (route, site, contra-indication)	**BCG VACCINATION :** It produces active immunity to protect the child from tuberculosis BCG vaccine is heat stable & in freeze dried form. It should kept away from direct light and stored in a cool environment below 2 to 8 degree centigrade. Normal saline is recommended as a dilute for reconstituting the vaccine may be used up within 3 hours and then discarded. **ADMINISTRATION OF BCG** At birth administered in institutional deliveries or as soon as possible after birth, or at 6 weeks, if not given at birth. The standard site is the middle of deltoid muscles over the left upper arm.	T:- Demonstration S:- observe the immunization ward	Q: How BCG Vaccine administer in clinics

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			The vaccine is given using a special tuberculin syringe in intra dermal route The does .05 ml in neonates &0.1 ml in infant. A satisfactory injection should produce a wheel of 5mm in diameter. If alcohol is use to swab the skin it must be allowed to evaporate before the vaccine is injected. A papule appears in 2 to 3 weeks at the site of correct intradermal injection of a potent vaccine. In 4 to 5 weeks the papule grows in size and then subsides or breaks into a shallow ulcer. It may be open or covered with a crust the ulcer heal in 8 to 12 weeks leaving a small scar		

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
4.	10 mins	To discuss about polio vaccination	**Complication** Deep ulceration, local abscess formation enlargement of axillary lymph glands, osteomyelitis, keloid formation over the injection site may develop. **POLIO VACCINATION:-** Oral polio vaccine (OPV) was first described by Sabin in 1997. The recently available OPV is heat stabilized and can be kept without losing potency at 4 degree C for a year and for a Month at room temperature. The non-stabilized vaccine should be stored at- 20 C in a deep freeze. OPV is administered with 'zero' dose at birth In institutional deliveries and then 3 doses at one	T:- Explain the vaccination co-relation with pulse polio programme S:- Listens and takes notes	Q: Explain Polio Vaccination

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			month interval from 6 weeks of age (6 weeks, 10 weeks and 14 weeks). -OPV can be given with DPT and BCG at the Same time and same day. -The dose is two drops or as stated on the Label of the vial and given orally. -It is very important to complete primary Course of OPV within 6 months. -Because most polio cases occurs between 6 months to 3 years. -One booster dose is recommended at 16 to 24 months of age.		

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			Contraindications:- -The contraindications for the administration Of OPV include, acute infectious disease, Fever, diarrhea, dysentery, leukemias, Malignancy and corticosteroids therapy. -After vaccination, breastfeeding can be Given, if the child is hungry, but hot drinks, Hot milk or hot water should be withheld for ½ hour. -The strategy of mopping up involves door To door immunization in high-risk areas Where wild poliovirus is known or Suspected to be still circulating.		

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
5.	10 min	To discuss DPT vaccination	**DPT-(Diphtheria, Pertusis,Tetanus) vaccination:-** -DPT is a combined vaccine administered for the protection against three diseases, i.e. diphtheria, pertusis and tetanus. -DPT/DT vaccines should be stored between 4 to 8 C temperature and should not be Frozen. -The vaccines will lose potency if kept at Room temperature over a longer period Of time. -For primary immunization, DPT vaccine is Administered in 3 doses at 4 weeks interval at 6 weeks, 10 weeks and 14 weeks of age. -Each dose is 0.5 ml and should be given deep intramuscularly as all vaccines contain mineral carriers or adjuvant.	T: Explain with power point presentation ,lecture cum discussion S:- Listens and takes notes	Q: Describe about DPT vaccination

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
	5 min.		-The site of injection for children below one year of age should be lateral aspect of thigh (vastus lateralis muscle). -In older children, it may be given in upper And outer quardrant of the gluteal muscle. -The booster dose of DPT vaccine is given at 16 to 24 months of age followed by another booster dose of DT (Diphtheria, Tetanus) vaccine at the age of 5 to 6 years, Without pertussis component. DPT vaccination usually not recommended after 6 years of age. -So children above the age 5 years ,Who Received the primary course of DPT Vaccine earlier, should receive only DT as booster at 5-6 years and those who have not received DPT , need only two dose of		

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			DT vaccines at 4 weeks interval. -**Mild reactions** -Following DPT vaccination mild reactions are common. -In 2 to 6 percent vaccines, mild fever may Develop and in 5 to 10 percent cases have Swelling, or in duration and pain occur for 48 hours. -**The most severe complications** -Following DPT vaccination are neurological Problems like encephalopathy, prolonged Convulsions, infantile spasms and Reye's Syndrome. **Measles Vaccination** -Measles vaccine is live attenuated and		

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
7.		To explain Measles vaccination	tissue culture vaccine, available as freeze Dried product. -It is safe and effective. -Heat stable measles vaccine and its diluting fluid should be stored at 2 to 8 C Temperature to maintain their potency. -The measles vaccine is administered at the Age of 9 months, before this age maternal Antibody protects the infants. -Single dose of vaccine is given with 0.5 ml Amount in subcutaneous route. -The freeze dried vaccine should be reconstituted with diluting fluid and must be kept on ice and to be used within one hour. -Left over vaccine must be discarded and never used after 4 hours of opening the		Q:- What are the side effect of Measles vaccination

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
	5 min.	To detail about Hepatitis-B vaccination	vial. -No booster dose is recommended as the immunity usually appears for long duration. **-<u>After the measles vaccination reactions</u>** -May develop as fever and rash on 5 to 10 days after immunization and induces a mild measles illness but in reduced frequency and severity. -This may found in 15 to 20 percent of vaccines. -The fever may persist for 1-2 days and the rash for 1-3 days. **-<u>Severe reactions</u>** -May develop following this vaccination if the recommended temperature is not maintained , and necessary precautions		

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			are not followed. -Toxic shock syndrome -TSS may develop with contaminated vaccine or if the same vial is used for more then one session on the same day or next day. -The features of TSS are severe watery diarrhea , vomiting and high fever which usually develop within few hours of measles vaccination. -This condition may cause death within 48 Hours and case fatality rates are high. **-Contraindicated** -Measles vaccine is contraindicated in Infants below 6 months of age acute illness, Convulsions, allergy ,active tuberculosis,		

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			Malnutrition, immunodeficiency states, Malignancy and immune- suppressive Therapy (steroids,antimetabolites,etc). -Measles vaccine can be combined and effectively administered with other live attenuated vaccines such as mumps and `rubella. **Hepatitis 'B' Vaccination** -Hepatitis 'B' vaccination is now included in The immunization schedule. -Hepatitis 'B' vaccine are available in two Forms; a-plasma derived vaccine and b-RDNA yeast derived vaccine. -Plasma derived vaccine is based on the surface antigen (HBs Ag) which is harvested and purified from plasma of human carriers		

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			of hepatitis 'B' virus. -It is formalin inactivated subunit viral vaccine. -Each one ml dose of the vaccine contains 20 mcg of hepatitis surface antigen formulated in an alum adjuvant . -The vaccine is safe, effective and cheapest. -The hepatitis 'B' vaccine is given intramuscularly with the 3 doses in general at 0,1 and 6 months or 4 dose at 0,1,2, and 12 months in highly endemic area. -The dose of the vaccine is 0.5 ml for the Child below 10 years and one ml above 10 years at the same time interval. -Antibody response attained after 3 doses. -Immunity levels provide protection for about 3 to 5 years.		

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			-Booster doses may be administered after 3 to 5 years. **<u>Hepatitis 'B' vaccine is given for pre- exposure and post-exposure prophylaxis</u>.** -Examples-of post-exposure prophylaxis are protection of neonates born to carrier mothers and individuals accidentally exposed parenterally to HBV infection through transfusion, cuts, injuries and needlesticks. **<u>Other Available Vaccines</u>** 1-Rabies vaccines 2-Haemophilus influenza vaccines 3-Hepatitis 'A' vaccine 4-Varicella vaccines		

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			5-Influenza vaccines 6-Rotavirus vaccine 7-Cholera vaccines 8-Mumps vaccine 9-Rubella vaccine 10-Pneumococcal vaccine 11-Meningococcal vaccine 12-Japanese Encephalitis (JE) vaccines		

Summary and evaluation:- (10minutes)

- Explain vaccination (BCG ,OPV , DPT ,Hepatitis-B, Measles)
- All type of vaccination , side-effect, contra-indication, indication, Route, Site, Given in this lesson plan
- Draw the Immunization Schedule

Assignment:-

- List & Explain the various types of vaccination

Evaluation:-

Unit test of 50 marks once the unit IV is completed

Bibliography:-

1. Text book of Paediatric Nursing, Author- Parul Dutta, Second edition, Jaypee Brothers Medical Publishers , Page no. 36 – 44
2. Text book of Community Health nursing, Author J.E.Park & K.Park, Fourth Edition, Page no. 131-132

LESSON PLAN

Subject : Bioscience & Micro biology
Unit : IV
Topic : **Hypersensitivity & Autoimmunity**
Group : G.N.M 1st year
Place : CLASSROOM
Date & Time : ……..
Teaching Method : Lecture cum Discussion
AV aids : Black board & chalk
Students Pre requisite: The student should be able to identify the sensitive person who need treatment & would be able to recognize the hypersensitivity & autoimmunity

General objectives: At the end of the class Student will be able to gain knowledge regarding hypersensitivity & autoimmunity

Specific Objectives:

1. To define Hypersensitivity
2. To Explain Classification Of hypersensitivity
3. To Discuss Difference Between Immediate & delayed Hypersensitivity
4. To explain types of Hypersensitivity Reaction & Their Features
5. To Define Autoimmunity
6. To Explain the Features of Autoimmunity
7. To Describe Mechanism of Autoimmunization

Introduction: Ask the students if they seen any one allergic reaction in your family member & friends

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
1.	3 min	To define hypersensitivity	**Definition :** The term hypersensitivity refers to the Injurious consequence in the sensitsed host , following contact with specific antigens.	T: Explain with PPT S:Listen & takes notes	Q:What is Hypersensitivity
2.	7 min.	To explain classification of hypersensitivity	**Classification :-** 1.Immediate hypersensitivity (B-Cell or antibody mediated) -Anaphylaxis - Antibody mediated cell damage - serum sickness - Atopy - Arthus phenomenon	T:Explain classification with black board & chalk or PPT	Q: Explain classification of Hypersensitivity
3.	10 min.	To discuss difference between immediate and delayed hyper sensitivity	2. Delayed hypersensitivity (T-Cell Mediated) - Infection (Tuberculin) type -contact (dermatitis) type **Difference between immediate & Delayed hypersensitivity :-** **1. Immediate Hypersensitivity:-**	T: Explain with PPT, lecture cum discussion S:- Listen and take notes	Q: What is the difference between Immediate and delayed hypersensitivity

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
			-Appears and receds rapidly - Induced by antigens or haptens any route -Circulating antibodies present and responsible for reaction; antibody mediated reaction - Passive transfer possible with serum - Desensitation easy, but shortlived. - appears slow last longer		

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
			2. Delayed hypersensitivity:- - induced by infection, By antigen injected intradermally or with Freud's adjuvant or by skin contact. - circulating antibodies may be absent and not responsible for reaction ;'cell mediated' reaction - Cannot be transferred with serum; transfer Possible with T-lymphocytes or transfer sector - Desensitization difficult ,but long lasting		

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
4.	10 min. .	To explain types Of hypersensitivity reaction and their features	**Type of hypersensitivity reaction and their features:-** **Type 1st:- IgE Type** Clinical syndrome:- -Anaphylaxis - Atopy Time Required for manifestation :- -minutes Mediators:- IgE : Histamine & other pharmacological agents **Type 2nd :- Cytolytic and Cytotoxic** Clinical syndrome :- -Antibody mediated damage-thrombocytopenia- Agranulocytosis , hemolytic anemia ,etc	T: Lecture cum discussion S:- listen and take notes	Q:Explain hypersensitivity reactin and their feature

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
			Time required for Manifestation:- Variable : hours to days Mediators :- IgE : Igm C **Type 3rd :- Immune Complex Reaction** Clinical syndrome;- -Arthus reaction - Serum sickness Time required For manifestation:- Variable :- Hours To Days Mediators :- IgG :-Igm ,C, Leucocytes **Type 4th :- Delayed Hypersensitivity** Clinical Syndrome :- 1 Tuberculin 2 Contact dermatitis Time required for manifestation :- - Hours to days Mediators:- T cells ; lymphokines; Macrophages.		

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
5.	5 min	To define autoimmunity	**AUTOIMMUNITY** **Definition :-** Autoimmunity is a condition in which Structural or functional damage is produced by the Action of immunologically competent cells or antibodies against the normal components of the body. Autoimmunity literally means 'protection against self ' but it actually implies 'injury to self'	T: Lecture cum discussion S:- listen carefully and take notes	Q: Define Autoimmunity

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
6.	5 min.	To explain features of autoimmunity	**ETIOLOGY OF DISEASE:-** 1. An autoimmune response , humeral, cellular, Both ,must be regularly associated with the disease 2. the antigen responsible for the immune response must be identified, isolated and characterized 3. The same antigen must be induced in experimental animal immuno pathological changes as in the disease. 4.passive transfer of the disease must be Possible by transfer of antibodies or sensitized Lymphocytes. **Features:-** 1. An elevated level of of immunoglobulins 2. Demonstrable autoantibodies 3. Deposition of immunoglobulins or their Derivatives at the sites of election, such as renal glomeruli 4. Accumulation of lymphocytes and plasma cells At the sites of lesions 5.Temporary or lasting benefit from corticosteroid or other immunosuppressive therapy 6.The Occirence of more than one type of autoimmune lesion in an individual	T: Lecture cum discussion S: Listen and take notes	Q: What are the features of autoimmunity?

S.No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
7.	10min	To describe mechanism of autoimmunity	**<u>Mechanism of autoimmunity</u>:-** 1. Hidden antigens may not be recognized as self antigens . when such antigens are released into circulation , they may induce an immune response 2. cells or tissue may undergo antigenic alteration as a result of physical , chemical or biological influences . such altered or 'neoantigens' may elicit an immune response. 3. immunological damage may result from immune response induced by cross reacting foreign antigens. 4. Breakdown of immunological homeostasis may may lead to cessation of tolerance and the emergence of forbidden clones of immunocompetent cells capable of mounting immune response against self-antigens 5. A variety of T and B cell defects have suggested as possible mechanism **<u>Classification Of Autoimmune Disease:-</u>** **(A)Hemolytic Autoimmune Disease:-** 1. Autoimmune hemolytic anemias 2. Autoimmune thrombocytopenia 3. Autoimmune leucopenia **(B) Localised (Organic specific) Autoimmune Disease:-** 1. Autoimmune disease of thyroid gland	T:Lecture cum Discussion S:Listen and take notes	Q: Describe the mechanism of autoimmunity

Summary & Evaluation (10 minutes):

1. Define Hypersensitivity & Autoimmunity
2. Explain difference between immediate & Delayed Hypersensitivity
3. Do you know about type of Hypersensitivity Reaction and their Features(Ask 6 Students)
4. What are The Classification Of autoimmune disease

Assignment:

- Write down Difference between immediate and Delayed hypersensitivity

Evaluation:

-Unit Test For 50 marks once the unit IV is completed.

Bibliography:-

1. Text book of Microbiology, Author – R. Ananthanarayan & C.K. Jayaram Panikar, Fifth Edition Page no. 147 to 156
2. Text Book of Microbiology, Author – Professor C.P.Baveja ,Arya publication, second edition Page No. 151 to 159
3. www.google.com

LESSON PLAN

Subject	: Bioscience & Microbiology
Unit	: IV
Topic	: **Principle & Uses of Serological Tests.**
Group	: G.N.M 1st year
Place	: CLASSROOM
Date & Time	: …….
Teaching Method	: Lecture Cum demonstration.
AV aids	: Black Board & Chalk Projector
Students Pre requisite	: The students should be able to collection of the Sample in the Lab & ask any specific incidence during collection of sample.
General objectives	: At the end of the class students will be able to Gain knowledge regarding Serological test.

Specific Objectives:-

1. To define serology and serological test.
2. To describe the principle of serological test
3. To Discuss Uses of serological test.
4. To explain types of serological test.
5. To Detail about Result meaning.

Introduction: - List the name of serological test related to bacterial infection & Untreated infection Related to Virus.

S.No	Duration	Specific objective	Content	Teaching Learning	evaluation
1.	10 min.	To define serology and serological test.	**Serology:-** the study of antigen-antibody reactions in vitro. or The branch of science concerned with serum, especially with specific immune or lytic serums; to measure either antigens or antibodies in sera. **Serologic Tests:-** Serologic tests are blood tests that look for antibodies in your blood. They can involve a number of laboratory techniques. Different types of serologic tests can diagnose various disease conditions. Serologic tests have one thing in common.	T:- Lecture cum discussion S:- Learn & listen and take notes carefully.	Q:- What do you mean by serological test

S.No	Duration	Specific objective	Content	Teaching Learning	evaluation
2.	10 min.	To explain the principle of serological test	They all focus on proteins made by your immune system. This vital body system helps keep you healthy by destroying foreign invaders that can make you ill. **<u>Principle of serological test</u>** ➢ The duration of antibody responses to various organisms differ. ➢ Its is important to know basal titer of normal healthy individual of the same age sex habitat and social habitat of the patient. ➢ Antibody responses are not detectable for a weeks time after onset of infection.	T:- lecture cum discussion black board and chalk S:- Listen & Take notes .	Q:- explain the principle of serological test

S.No	Duration	Specific objective	Content	Teaching Learning	evaluation
			➢ The formation of these antibody in the serum of a patient is the result of microbial infection. ➢ Detectable antibodies may not be formed in a patient suspected of suffering from illness in which antibodies are mostly formed. ➢ Antibodies are not necessary protective in nature and so not realted to [person immune status **<u>Uses Of Serological Test:-</u>**		
3.	10 min	To Discuss Uses of serological test	1) It's helpful to know a little about the immune system and why we get sick. 2) Antigens are substances that provoke a	T: lecture cum discussion with PPT	Q:Do I Need a serological test?

S.No	Duration	Specific objective	Content	Teaching Learning	evaluation
			response from the immune system. 3) They can enter the human body through the mouth, through broken skin, or through the nasal passages. 4) Antigens that commonly affect people include the following:- • Bacteria • Fungi • Viruses • parasites 5) The immune system defends against antigens by producing antibodies. 6) These antibodies are particles that attach to	S: Listen and take notes	

S.No	Duration	Specific objective	Content	Teaching Learning	evaluation
			the antigens and deactivate them. 7) When your doctor tests your blood, they can identify the type of antibodies and antigens that are in your blood sample and identify the type of infection you have. 8) Sometimes the body mistakes its own healthy tissue for outside invaders and produces unnecessary antibodies. This is known as an autoimmune disorder. 9) A serological test involves detection of specific changes, induced by a pathogen, in the properties or actions of serum of an infected host.	T:- explain types of serological tests. S:- listen carefully and take notes	Q:- what are the types of serological tests.

S.No	Duration	Specific objective	Content	Teaching Learning	evaluation
4	10 min	To explain types of serological test	10) The test may detect the presence in serum of either antibodies to the pathogen (produced by the host) or antigens (i.e. the infecting agent itself and/or its components) **<u>Types of Serologic Tests:-</u>** Because antibodies are so diverse, various tests are useful for detecting the presence of different types: 1)An agglutination assay shows whether antibodies exposed to certain antigens will cause particle clumping. 2) A precipitation test shows whether the antigens are similar by measuring for the presence of antibody in body fluids.	T:Lecture cum discussion and explain with PPT S:Listen and take notes	Q: Explain types of Serological test

S.No	Duration	Specific objective	Content	Teaching Learning	evaluation
5.	10 min.	To Detail About Result meaning.	3) The Western blot test identifies the presence of antimicrobial antibodies in your blood by their reaction with target antigens. **Results Mean:-** **Normal Test Results:-** Your body produces antibodies in response to antigens. If testing shows no antibodies, it indicates you don't have a current or past infection. Results that show there are no antibodies in the blood sample are normal.	T:- Demonstrate in lab ,lecture cum discussion S:- In the laboratory finding the last result by report	Q: Explain the normal and abnormal test result.

S.No	Duration	Specific objective	Content	Teaching Learning	evaluation
			(A)<u>Abnormal Test Results:-</u> Antibodies in the blood sample often mean you've had an immune system response to a specific antigen from either a current or a past exposure to a disease or foreign protein. The testing may also diagnose an autoimmune disorder. In that case, antibodies to normal or non-foreign proteins or antigens would be present in the blood. The presence of certain types of antibodies can also mean that you're immune to one or more antigen. This means that future exposure to the antigen or antigens won't result in illness.		

S.No	Duration	Specific objective	Content	Teaching Learning	evaluation
			Serologic testing can diagnose multiple illnesses, including: **brucellosis**, which is caused by **bacteria** **amebiasis**, which is caused by a **parasite** **measles**, which is caused by a **virus** **rubella**, which is caused by a **virus** HIV syphilis fungal infections.		

Summary and evaluation 10 minutes):

1. Define Serological test with uses of serological test.
2. What do the result mean?
3. Ask the questions What happen after Serological test.(7 students).

Assignment:

List the serological test taken by the Doctor in your Hospital.

Evaluation:

After Complete the unit Objective type questions 20. (Question paper given to the students) & Cross check self By the students.

Bibliography:-

1.Text book of Medical Laboratory And technology, Author – Praful.B.Godkar, Seventh edition, Elsevier Publication, Page no. 145-151.

2.Text book of microbiology ,Author- Seema Sood, Fifth Edition , Page no. 181-183.

3.The short textbook of medical microbiology, Author Satish Gupta, 9th edition ,jaypee brother, Page no 466

LESSON PLAN

Subject : Bioscience & Microbiology

Unit : V

Topic : **Principles and method of microbial control**

Group : GNM 1st year

Place : CLASSROOM

Date & Time : …….

Teaching Method : Lecture Cum discussion method

AV aids : Projector , Black Board & Chalk

Students Pre requisite : The students should be able to know about principle and method of microbial control.

General objectives : At the end of the class student will be able to gain knowledge regarding microbial control.

Specific Objectives :

1. To explain the principles of microbial control.
2. To explain the knowledge regarding transfer forceps

Introduction: Brain storm what they should use for prevention of microbes.

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
1.	30 min	To explain the principles of microbial control	**<u>Principles & methods of microbial control</u>:-** 1. Always face the sterile field. Do not turn your back or side on a sterile field. 2. Keep sterile equipment above your waist level or above table level. 3. Do not speak, cough or sneeze over a sterile field. If it is necessary to do so, turn your head away from the sterile field. 4. Never reach across a sterile field. 5. Prevent excessive air currents around the sterile areas. Air currents can be caused by moving fast flapping the clothes and drapes and by closing the doors etc. 6. Keep the unsterile objects away from the sterile field. 7. Handle liquids cautiously near the sterile field or prevent drapes or wrappers from becoming wet. 8. Keep the sterile field dry. 9. The edge of the sterile field is considered unsterile. 10. Each sterile supply should be clearly labeled	T:- Explain the principles of microbial control with lecture cum discussion , PPT S:- Learn and listen carefully and take notes.	Q:- What are the principle of microbial control?

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
			as to its contents, time and date of sterilization. 11. Never assume that a object is sterile. Always check the sterility expiration date. 12. Avoid sweeping and dusting when the sterile objects are opened. 13. Wash hands put on gowns, gloves and masks before handling the sterile supplies. 14. Open the sterile packages in such a way that edges of the wrapper are directed away from the worker.		
2.	10 min.	To Explain the knowledge regarding Transfer of forceps	**Regarding the transfer forceps:** • Hold the transfer forceps pointing downwards. • When removing the forceps from the container lift it without touching the sides and the rim of the container. • Keep the prongs (tip) of the forceps within the vision while using them. • Gently tap the prongs together directly over the container to remove the excess solution.	T:Demonstrate the procedure in demonstration room S:- Observe and take notes.	Q : Explain how to use Transfer forceps

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
	10 min.		• Transfer forceps and the container should be sterilized daily. **Regarding the containers:** • Remove the cover from the container when necessary and only for a short period of time. • Lift the cover of the container in such a way that the inside of the lid is pointing down. • Invert the cover only when it is necessary to place it down. • Consider the rim of the cover and the container to be contaminated. • Do not return the unused sterile objects to the container, once they have been taken out.		

Summary and evaluation (10 minutes):

1. Explain the principles of microbial control.
2. Discuss abut regarding Transfer Forcep And Container.

Assignment:

Write the principles of microbial control.

Evaluation:

Unit test for 50 marks once the unit 5th is completed.

Bibliography:

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LESSON PLAN

Subject : Bio science and microbiology

Unit : V

Topic : Sterilization & disinfection

Group : G.N.M 1st year

Place : CLASSROOM

Date & Time : ……..

Teaching Method : Lecture cum demonstration

AV aids : Black board with the projector.

Students Pre requisite : The students should be able to identify the Unsterilized Equipments & transfer with expiry Date, date of Autoclave, Name of the equipment, labeled.

General objectives : At the end of the class student will be able to gain knowledge regarding sterilization and Disinfection.

Specific Objectives:

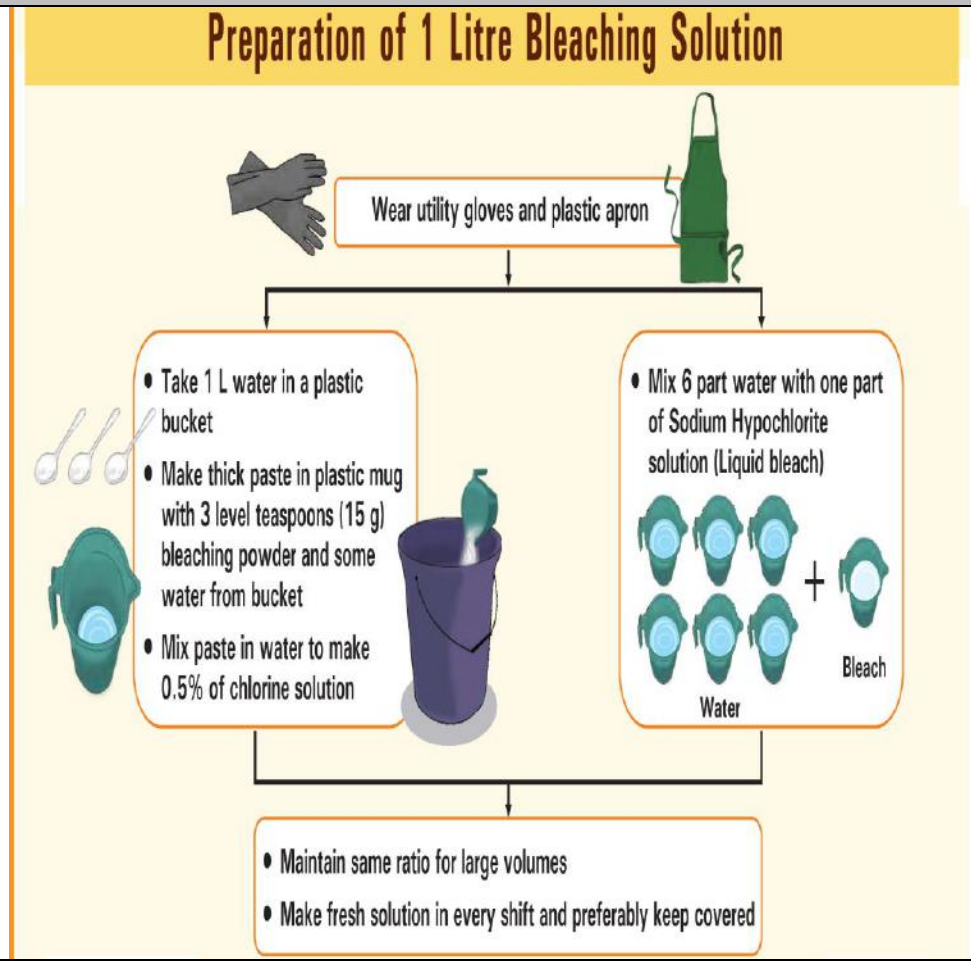
1. To define Disinfection & types of disinfection for articles
2. To define sterilization
3. To explain the methods of sterilization

4. To discuss working of an autoclave
5. To discuss the chemical method of sterilization.

Introduction : List the method of sterilization with meaning of disinfection and sterilization.

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
1.	10min.	To define Disinfection & types of disinfection for articles.	**Disinfection:** It means the destruction of all pathogens or organisms capable of producing infection but not necessary spores. All organisms may not be killed but the number is reduced to a level that is no longer harmful to health. **<u>Disinfection of articles (types)</u>** **<u>Concurrent Disinfection</u>:-** Concurrent disinfection means the immediate disinfection of all contaminated articles and bodily discharges during the course of the disease. It includes: Cleaning of the isolation unit daily, including the floors using an effective disinfectant. Disinfection of all articles including the soiled linen, contaminated articles etc.before it is sent out of the unit. Disposal of all wastes by incineration. Safe disposal of excreta.	T:- Lecture cum discussion S:- Listen & learn carefully and take notes.	Q:- Define disinfection and describe the types of Disinfection

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
			Terminal Disinfection:- The terminal disinfection is the disinfection of the patient's unit with all the articles used on discharge, transfer or death of a patient who had been suffering from an infectious disease. **Prophylactic Disinfection:-** Boiling of water, pasteurization of milk & hand wash with soap are the examples of prophylactic disinfection.		

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
					

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
2.	3 min.	To define	**Fumigation with sulphur:-** The room should be filled with steam by boiling a cattle of water as the sulphur fumes act better on a damp surface. A small room of 100qft would require about 220gm sulphur. A little methylated spirit is poured over the sulphur to ensure burning the sulphur completely. The room is opened after 24hrs. **Fumigation with formalin:-** Formalin is more efficacious as a surface disinfectant and is also more expensive. For every 100 cubic feet of room space that is to be disinfected, take 140 gram of potassium permanganate crystal and 250 ml of formalin mix it and place them in a metal bowl. The heat produced by the chemical action evaporates the formaldehyde. The room should be sealed for 12 to 24 hours. At the expiration of the stated time, the doors and windows are thrown opened. **Sterilization:** It is a process by which an article, surface or medium is made free of all micro-organisms either in the vegetative or spore	T:-Lecture	Q:- What is

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
		sterilization	form. **Methods of Sterilization:** **Physical Method:-** Sunlight	cum Discussion S:- Listen and take notes.	sterilization
3.	10 min.	To explain the methods of sterilization.	Heat: a. Dry Heat b. Moist Heat Filtration Radiation **Chemical Method:-** Alcohols Aldehydes Phenols Halogens Oxidizing Agents Salts Surface Active Agents Dyes Vapour Phase Disinfectants **Physical Methods:** **Sunlight:** Sunlight has an active germicidal effect due to its	T:-Lecture cum Discussion S:- Listen and take notes.	Q: List the method of sterilization

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
			content of UV rays. It is a natural method of sterilization in cases of water in tanks, rivers and lakes. **Heat :** Heat is the most reliable and commonly employed method of sterilization. **Dry Heat Sterilization** Red Heat Flaming Incineration Hot Air Oven **Red Heat:** Inoculating wires or loops, tips of forceps and needles are held in the flame of a Bunsen burner till they become red hot. **Flaming:** Glass slides, scalpels and mouths of culture tubes are passed through Bunsen flame without allowing them to become red hot. **Incineration:** Infective material is reduced to ashes by burning. Instrument named incinerator may be used for this purpose. Soiled dressings, bedding and pathological materials are dealt with this method. **Hot Air Oven:** The oven is electrically heated and is fitted with a fan to ensure adequate and even distribution of hot air in the		

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
			chamber. It is also fitted with a thermostat that maintain the chamber air at a choosen temperature. 160°C for 2hrs, 170°C for 1hr and 180°C for 30mins is required for sterilization. **Moist Heat Sterilization:** **At a temp below 100°C** **Pasteurization of milk:** Two type of methods- holder method (63°C for 30mins) and flash method (72°C for 20mins). **Inspissation:** Some serum or egg media are rendered sterile by heating at 80-85°C for 30mins daily on three consecutive days. **Vaccine bath:** Bacterial vaccines are sterilized in special vaccine bath at 60°C for 1hr. Body fluid or serum can be sterilized by heating for 1hr at 56°C in a water bath on several successive days. **At a temp of 100°C** **Boiling:** Boiling for 10-30mins may kill most of the vegetative forms but many spores withstand boiling for a considerable time. Boling may be used for glass syringes and rubber stoppers.It is not recommended for the sterilization instruments used for surgical procedures. **At a temp above 100°C**		

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
4.	10 min	To discuss working of an autoclave.	**Autoclave:** The steam in the autoclave should be at 15lbs/inch^2 pressure, at 121^{o}C temp. This pressure and temp should be maintained for 30mins. With this microorganisms are destroyed with their spores. **working of an autoclave:** Autoclave is the name given to a sterilizer that utilizes saturated steam under pressure. The steam is used in the autoclave for two reasons: When steam is held is a closed container, it is compressed and the temp rises far above that of the boiling point of water. Steam is able to penetrate porous materials very rapidly, provided that, it is not impeded by unsuitable wrappers or by air trapped within fabrics or hollow instruments. An Autoclave consists of an outer chamber and an inner chamber, which can be tightly closed by a safety lock. The steam introduced first into the outer chamber until the desired temp is reached. At this point the steam is turned into the inner chamber which is packed with articles, that are to be sterilized. As the steam enters the inner chamber, the air is forced out through the valves.	T:- Discuss the working of Autoclave with PPT S:- Listen carefully and take notes.	Q:Explain the working of an autoclave

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
			The steam is kept flowing into the inner chamber until the desired temp is reached. It is very important to note the temp as well as the pressure of the inner chamber. When the desired levels are reached, it should be maintained to the desired length of time. The removal of air from an autoclave, during the sterilization process is important for two reasons: Air left in the center of a pack or in the cannula of a catheter will prevent the steam from coming into the direct contact with the center of the pack or to the lumen of the catheter. Failure to contact means failure to sterilize. Air mixed with steam reduces the temp of the steam. At the end of the period, the steam supply is shut off, but the door is not opened until the pressure gauge is at zero and the temp has fallen to 100^{o}C. **General Instructions:** The wrapper and the container should allow penetration of the steam into the article. The inner chamber must not be too full nor the contents arranged too compactly. Bundles and drums must be packed		

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
			loose. Cans or jars must be opened and turned on their sides so that steam can easily penetrate the contents. In operating an autoclave, it is important to remember that all the air in the inner chamber must be driven out and entirely replaced by steam. Otherwise although the gauge may show a pressure of 15lbs, this pressure would be caused by a mixture of steam and air and the temp would be lower than that of the steam alone. **Filtration:** This method of sterilization is useful for substances which get damaged by heat process e.g. sera, sugars, anti-biotic solutions etc. **Types of filters:** Candle filters: Used for purification of water. Membrane filters Air Filters: Used to deliver clean bacteria free air to a room. Syringe filters **Radiation:** **Ionizing Radiation:** These include gamma rays, x-rays and cosmic rays. They have very high penetrating power. They damage DNA by various mechanisms. Gamma radiations		

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
			are commercially used for sterilization of disposable items such as plastic syringes, swabs, culture plates, cannulas, catheter etc. This method is also known as cold sterilization because there is no appreciable increase in temp. **Non-Ionizing Radiation:** These include infra-red and UV radiations. Infra-red is used for rapid mass sterilization of syringes and catheters. UV radiations with wavelength of 240-280nm has marked bactericidal activity. It acts by denaturation of bacterial protein and interference with DNA replication. UV areas such as bacteriological laboratory, inoculation hoods, operation theatres. **Chemical Methods:** **Alcohols:** Ethy Alcohol and iso-propyl alcohol are the most frequently used. They act by denaturing bacterial proteins.		

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
			Methyl alcohol is effective against fungal spores. **Aldehydes:** Formaldehyde: It is markedly bactericidal, sporicidal and virucidal. It is used both aqueous solution and in gaseous form. A 10% Aqueous solution of formalin is routinely used. Gluta aldehyde: It is effective against bacteria, fungi, viruses. It is less toxics and irritant to eyes and skin than formaldehyde. It is used as 2% buffered solution. It is available commercially as "cidex". It can be used for delicate instruments having lenses. **Phenols:** Phenol derivatives: **Cresols:** Lysol is a solution of cresols in a soap. It is most commonly used for sterilization of infected glass wares, cleaning floors, disinfection of excreta. **Chlorhexidine:** Savlon is widely used in wounds, pre operative disinfection of skin, bladder irrigant etc. **Chloroxylenol:**		

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
5.	7 min.	To discus the chemical method of sterilization.	It is an active ingredient of dettol. It is less toxic and less irritant. **Halogens:** Chlorine and iodine are two commonly used disinfectants. **Chlorine** is used in water supplies, swimming pools, food and dairy industries. Chlorine in the form of bleaching powder, sodium hypo chlorite and chloramine are also used. **Iodine** is alcoholic and aqueous solution is used as a skin disinfectant. Betadine is one example of commonly used iodophores. **Oxidizing Agents:** **Hydrogen Peroxide (H_2O_2):** It is effective against most organisms at concentration of 3-6% while it kills all organisms including spores at higher concentration 10-25%. It is used to disinfect contact lenses, surgical prostheses and plastic implants. **Salts:** The salts of copper, silver, mercury are used as disinfectant. **Surface Active Agents:**	T:- Discuss the chemical method of sterilization. with PPT S:- Listen and learn carefully and take	Q: What are the methods of chemical sterilization?

S.No.	Duration	Specific objective	Content	Teaching Learning	evaluation
			Substances which alter energy relationship at interfaces, producing a reduction of surface tension are known as surface active agents. Ex. Cetrimide. **Dyes:** Two groups of dyes: Aniline Dyes and Acridine Dyes have been used extensively as skin and wound antiseptics. Gentian violet is widely used dye for skin disinfection. **Vapour Phase Disinfectants:** **Formaldehyde Gas:** This is employed for fumigation of operation theatres, wards, laboratories etc. **Ethylene Oxide:** It is specially used in sterilizing plastic and rubber articles, respirators, heart-lung machines, sutures, dental equipments and clothing. It is unsuitable for fumigation of rooms because of it's explosive nature.	notes	

Summary and evaluation (10 minutes):

1. Enlist the method of disinfection & Sterilization.
2. Formation of Chlorine Solution(For students).
3. Used of pressure in the Autoclave method.

Assignment:

For Disinfection of Articles what are you doing in your Hospital.

Evaluation:

Next day ask questions in the class by Random Method And Observe during Duties.

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2. Textbook Of Community Health Nursing , Author – K.Park , Fourth edition, Published By Banarasidas Bhanot,

LESSON PLAN

Subject : Bio-science & Micro-biology
Unit : V
Topic : **Chemotherapy, Antibiotics & Pasteurization**
Group : G.N.M. 1st year
Place : CLASSROOM
Date & Time : …….
Teaching Method : Lecture method
AV aids : Black board & Chalk with Projector
Students Pre requisite: Student should be able to Identify Antibiotics & in the house used Method of Pasteurization of milk.
General objectives : At the end of the class student will be able to gain knowledge regarding antibiotics & Pasteurization with Chemotherapy

Specific Objectives :

1. To define chemotherapy
2. To explain the function and effect of chemotherapy
3. To define Antibiotic
4. List main type of antibiotic
5. To give knowledge regarding taking an antibiotic
6. To explain side-effects of antibiotic
7. To define pasteurization
8. To explain the method of pasteurization

Introduction: Ask the students if they know Antibiotics used for infection & kill the organism in the milk by pasteurization

S No	**Duration**	**Specific objective**	**Content**	**Teaching Learning**	Evaluation
1.	**5** min	To define chemotherapy	**Definition: -** Chemotherapy is defined as the antineoplastic agents are used in an attempt to destroy tumor cells by interfering with cellular functions, including replication. Chemotherapy may be combined with surgery, radiation therapy or both to reduce tumor size preoperatively	T**: -** Lecture cum Discussion S:- Listen and take notes carefully.	Q: What is Chemotherapy
2.	10 min.	To explain function and effect of Chemotherapy	**Function of chemotherapy** Chemotherapy works by stopping or slowing the growth of cancer cells, grow and divide quickly. But it can also harm healthy cells that divide quickly, Damage to healthy cells may cause side effects. Often, side effects get better or go away after chemotherapy is over. **Effect of chemotherapy**:-Cure cancer when chemotherapy destroys cancer cells to the point	T:- Lecture cum discussion S:- Listens and takes Notes	Q:Explain the functions and effects of chemotherapy

S No	Duration	Specific objective	Content	Teaching Learning	Evaluation
			that your doctor can no longer detect them in your body and they will not grow back**.** **Control cancer** - when chemotherapy keeps cancer from spreading, slows its growth, or destroys cancer cells that have spread to other parts of your body**.** **Ease** cancer symptoms (also called palliative care) - when chemotherapy shrinks tumors that are causing pain or pressure **<u>Uses Of Chemotherapy:-</u>** Sometimes, chemotherapy is used as the only cancer treatment. But more often, you will get chemotherapy along with surgery, radiation therapy, or biological therapy. Chemotherapy can: ➢ Make a tumor smaller before surgery or radiation therapy. This is called neo-		

S No	**Duration**	**Specific objective**	**Content**	**Teaching Learning**	Evaluation
			adjuvant chemotherapy. ➢ Destroy cancer cells that may remain after surgery or radiation therapy. This is called adjuvant chemotherapy. ➢ Help radiation therapy and biological therapy work better. ➢ Destroy cancer cells that have come back (recurrent cancer) or spread to other parts of your body (metastatic cancer		

S No	Duration	Specific objective	Content	Teaching Learning	Evaluation
3.	5min.	To define Antibiotic	**ANTIBIOTIC** **Definition:-** Antibiotics are a group of medicines that are used to treat infections caused by germs (bacteria and certain parasites). They do not work against infections that are caused by viruses - for example, the common cold or flu. Antibiotics are normally only prescribed for more serious bacterial infections - for example, pneumonia.	T:-Lecture Cum discussion S: Listen and take notes	Q: What is antibiotics?
4	8 min.	List Main type of antibiotics	**The main types of antibiotics include**: • **Penicillins** - for example, phenoxymethylpenicillin, flucloxacillin and amoxicillin • **Cephalosporins** - for example, cefaclor, cefadroxil and cefalexin. • **Tetracyclines** - for example, tetracycline, doxycycline and lymecycline. • **Aminoglycosides** - for example, gentamicin and tobramycin. • **Macrolides** - for	T: Explain with PPT S:- Listen carefully and Take notes	Q: List type of antibiotics.

S No	Duration	Specific objective	Content	Teaching Learning	Evaluation
5.	5Min	To give knowledge regarding taking an antibiotic	example, erythromycin, azithromycin and clarithrom ycin. • **Clindamycin**. • **Sulfonamides and trimethoprim** - for example, co-trimoxazole. • **Metronidazole and tinidazole**. • **Quinolones** - for example, ciprofloxacin, levofloxacin and norfloxacin. **Taking an Antibiotic** Always take the entire course of antibiotics as directed by your doctor. Even though you may feel better before your medicine is entirely gone, follow through and take the entire course. This is important for your healing. If an antibiotic is stopped in mid-course, germs (bacteria) may be partially treated and not completely killed. Bacteria may then become resistant to that antibiotic. **Antibiotic is usually prescribed:-** The choice of antibiotic mainly depends on which infection you have and the germ (bacterium or parasite) your doctor thinks is causing your infection.	T: Lecture cum discussion S: Listen and takes notes	Q:Explain precaution for taking antibiotics.

S No	Duration	Specific objective	Content	Teaching Learning	Evaluation
6.	5min.	To Explain the side effects of antibiotic	**<u>There are other factors that influence the choice of an antibiotic. These include:</u>** • How severe the infection is. • How well your kidneys and liver are working. • Dosing schedule. • Other medications you may be taking. • Common side-effects. • A history of having an allergy to a certain type of antibiotic. • If you are pregnant or breast-feeding. **<u>Side Effects:-</u>** • Severe watery diarrhoea and tummy (abdominal) cramps. • Shortness of breath, hives, rash, swelling (of the lips, face, or tongue), • Vaginal itching or discharge. • White patches on the tongue • Being sick (vomiting)	T:- Lecture cum discussion black board, Chalk S: Listen and takes notes	Q: Explain side effect of antibiotics

S No	Duration	Specific objective	Content	Teaching Learning	Evaluation
7.	5 min.	To Define pasteurization	**Pasteurization:-** Partial sterilization of a substance and especially a liquid (as milk) at a temperature and for a period of exposure that destroys objectionable organisms without major chemical alteration of the substance.	T:- Lecture cum discussion S:- Listen Carefully and take notes	Q : What is Pasteurization?
8.	7 min.	To explain method of pasteurization	**Methods of Pasteurization** **(A) Holder (or "vat") pasteurization** • The simplest and oldest method for pasteurizing milk. Milk is heated to 154.4 degrees Fahrenheit (63 degrees Celsius) in a large container and held at that temperature for 30 minutes. This process can be carried out at home on the stovetop using a large pot • For small-scale dairies, with steam-heated kettles and fancy temperature control equipment. In batch processing, the milk has to be stirred constantly to make sure that each particle of milk is heated.	T:- Lecture cum discussion S:-Listen carefully & take notes	Q:- What are the method of pasteurization ?

S No	Duration	Specific objective	Content	Teaching Learning	Evaluation
			(B) High-temperature short-time (HTST) pasteurization, or flash pasteurization, is the most common method these days, especially for higher volume processing. This method is faster and more energy efficient than batch pasteurization. Though the higher temperature may give the milk a slightly cooked flavor, HTST pasteurization has been used for so long that people are used to the flavour. **(C) UHT method:-** The temperature of milk is raised ti 125 to 150 degree C for a few second only and than rapidly cooled. **Test of pasteurized milk** ➢ **Phosphatase test:-** These test is widely used to cheque that the milk has been properly pasteurized or not. The test is based on the principle that the enzyme phosphatase which is present in raw milk is destroyed during pasteurization. If phosphatase enzyme is present after pasteurization,it indicates that the milk has not been properly pasteurized		

Summary and evaluation:- (10 minutes)

- Define Chemotherapy, Antibiotic & pasteurization
- Which method used in pasteurization
- List antibiotics
- What are the side effect of antibiotics

Assignment:-

- List the Antibiotics and explain the method of pasteurization

Evaluation:-

- Unit test for 50 marks once the unit 5th is completed

Bibliography:-

- Text book of Microbiology, Author -Margret J.Parker, 6th Edition , Publication N.R.Brothers Page no. 42 to 54
- Text book of community health nursing , Author- J.E.Park & K.Park , 4th Edition, Publication Asrani publishers , Page no. 70-71

- To reduce tumor size preoperatively

LESSON PLAN

Subject : Bio-science & Microbiology

Unit : V

Topic : **Medical & Surgical Asepsis**

Group : G.N.M 1st year

Place : Classroom

Date & Time : ……..

Teaching Method : Lecture Method with demonstration

AV aids : Black board & Chalk, gown, sterile gloves and face mask

Students Pre requisite : The Student should be able to identify the infection, according these infective microbes wear PPE (Personal Protective Equipment) to prevent infection.

General objectives : At the end of the class student will be able to gain knowledge regarding medical & surgical asepsis.

Specific Objectives : At the end of the class the student will be able:

1.To define Asepsis & Medical Asepsis.
2.To discuss about cleaning of articles.

3.To demonstrate the steps of hand washing.
4.To explain the Gown technique.

5.To discuss the wear Face mask.
6.To define Surgical Asepsis.
7.To discuss about opening a sterile wrapped package.

Review of previous class : Ask question regarding source and types of infection and controlling method used in hospital.

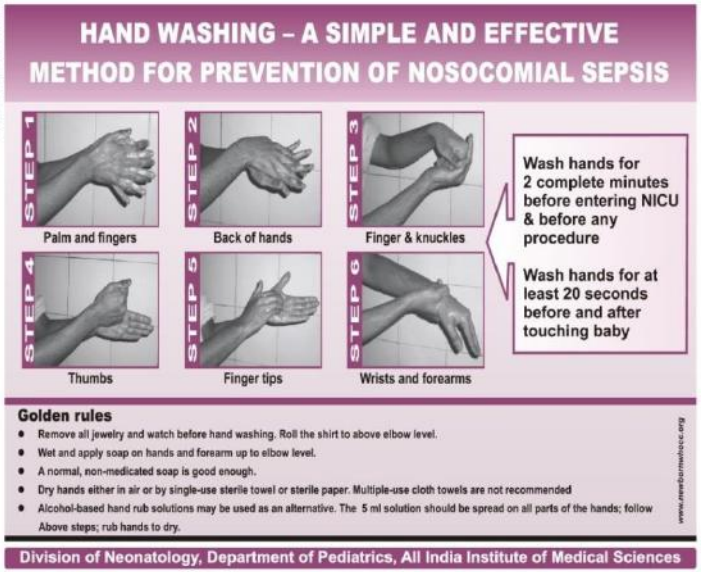
Introduction:

Ask the students if they know about PPE. Enlist the equipment.

Also mention the objectives of the lesson to the students here

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
1.	5 min.	To define asepsis & medical asepsis.	**Asepsis** : Freedom from infection or prevention of contact with micro-organisms **Medical asepsis :-** Medical asepsis refers to all practices used to protect the patients and his environment from the transmission of disease producing organisms (prevention of cross infection)	T:- define asepsis meaning of medical Asepsis S:- Learn & Listen	Q: Do you know about asepsis
2.	10 min.	To discuss about cleaning of articles	**Cleaning of articles :** **1.** Rinse the article first with cold water to remove the organic material .Hot water coagulates the organic matter and tends to make it to stick to the article. **2.** Then wash the articles in hot water and soap .Soap has an emulsifying action and reduces	T:- explain the procedure of cleaning the articles. S:- Observation-on in the operation theatre.	Q. How do you clean the articles in ward and hospital?

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			surface tension which facilitates the removal of dirt. Rinsing with water assists in washing the dirt away. **3.** Use an abrasive such as a stiff bristled brush and a paste or powder to wash the articles, brush will help to remove the dirt from the grooves and corners. 4. Rinse the article with clean water. 5. Dry them with a towel. There is less chance for the bacteria and dirt to lodge on the cleaned articles when it is dry. 6. Disinfect or sterilize if indicated.		
3.	10 min.	To demonstrate the steps of hand washing	**HAND WASHING**	T:- demonstrate the steps of Hand washing With PPT S: - Observe and Using the Procedure in the ward.	Q. shows hand washing technique.

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
4.	5 min.	To explain the Gown technique	 **The points to be remembered while using a gown (before use):** 1. Remove watches & rings because jewellery can harbour micro-organisms. 2. Wash hands and try (see the procedure above). 3. Hold the gown at the neck on the inside	T:- Demonstration by self S: - Observe & practice.	Q. demonstrate the Gown technique.

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			permitting to unfold (the open part of the gown is turned towards the nurse). 4. Slide hands and arms down the sleeves. 5. Fasten the ties at the neck. 6. Overlap the gown at the back as much as possible. Secure the waist band. **The points to be remembered while removing the gown (after use):** 1. Untie the waist band. 2. Wash hands. 3. Untie the neck ties (Be sure not to touch the outside of the gown). 4. Slide the gown down the arms and over the hands by holding the inside of the sleeves. 5. Hold the gown with both the hands (inside the shoulders) at the shoulder seams, The gown is		

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
5.	10 min.	To discuss wear face mask and gloves	turned inside out. The hands carded in the container provided. 6. Wash hands thoroughly. **<u>Face masks:</u>** Masks are generally used to prevent the spread of micro- organisms to and from the patient, through the respiratory tract. Masks should be worn only once and then discarded to ensure effective filtering of micro- organisms. The points to remember while wearing the masks: 1. Wash hands. 2. Remove the clean masks from the container with sterile forceps (The masks should be sterilised and kept for the use). 3. Hold the masks by its strings. Fit it to the face	T:- demonstrate by self with lecture S:- observe listen & take notes	Q. how to wear face mask and gloves?

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			and tie the strings at the back of the head. Do not touch the masks that cover the face. It is important that both mouth and nose must be covered. **To remove the masks:** 1. Wash hands. 2. Remove the gown (If worn). 3. Remove the masks and discard it in the container for used masks. 4. Wash hands thoroughly. **<u>Gloves :</u>** Gloves are used in the medical asepsis to protect the nurse from pathogens. Gloves are changed after each contact with the bodily discharges, to avoid cross infection of the patients with their own organisms.		

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			Ex. Gloves used for the cleaning of the patient should be changed before feeding the patient. Gloves must be changed between the two activities. The points to remember while wearing the gloves: 1. Wash hand. 2. Dry the hands and apply powder to facilitate insertion of gloves. 3. Put on the clean gloves. After attending to the patient, remove the gloves and discard them in the container with antiseptic lotion. Wash hands thoroughly.		
6.	10 min.	To define surgical asepsis	**<u>Surgical asepsis</u>** Surgical asepsis refers to all the procedures used to keep objects or areas sterile or completely free from	T:- demonstrate the procedure S:observe	Q. what do you mean by surgical asepsis and how you

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			all micro-organisms. **<u>Hand washing</u>** In surgical asepsis, the hands should be thoroughly cleansed for about 3 to 5 minute. -(In operating room , hands are scrubbed up to ten minutes). -When washing hands, they are held above the level of the elbows (In surgical asepsis the elbows are considered more contaminated then the hands).		wash your hand in operation theatre
7.	5 min.	To discuss about opening a sterile wrapped package	**<u>Opening a sterile wrapped package</u>** 1-Wash hands thoroughly. 2-Choose a large, clean working area Above waist level. 3-Place the package in such a way , that it	T: - Demonstration video S:- Observe & listen carefully	Q. explain the procedure of opening a sterile wrapped package

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			can be opened away from the body. 4-The flap farthest away is opened first, With care not to reach over the sterile Field. -Then the side flaps are opened and the flap Nearest the nurse is opened last. -When opening the flaps , care must be Taken not to touch the inside of the wrapper. -When opening the last flap, it is important to stand well back from the package in order to avoid contamination from the Nurse's uniform. -If an inner wrapper is present, it is opened in the same way, but using a sterile forceps. **<u>Use of gloves</u>** -To put on the first glove, the nurse grasps		

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			the glove by its cuff, being careful to Touch only the inside of the glove. -The sterility of the outside of the glove Must be maintained. -Remember that the nurse's hands are Considered to be contaminated. -To put on the second glove, the sterile Gloved hand must be used. -The second glove is picked up by inserting The gloved fingers under its cuff. -The second glove is then pulled on. -The cuffs of both gloves may then be Unfolded by touching only the sterile Sides. **<u>Gowning</u>** -Sterile gowns are worn in the operating		Q:- Difference between medical & Surgical gloves and Gowning technique

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			room and the delivery room and whenever open wounds are present which necessitate a sterile technique e.g. to attend to a patient with burns. -To keep the gowns sterile, they are folder inside out and are touched only on the Inside. -The points to remember when putting on a gown:- 1-Put on the head cap and mask first. 2-Scrubb hands thoroughly. 3-Dry the hands with sterile towel. 4-Pick up the gown by grasping the folded Gown at the neck. Stand will back about one foot from the sterile bundle and the Table. 5.Unfold it by keeping the gown away		

S. No	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			From the body. Do not shake the gown. 6. Hold the gown at the shoulder seams (inside) and put each hand alternately into the arm holes. 7. Extend the arms and hold hands upwards at the shoulder height when putting them through the arm holes. 8. The circulating nurse then assist her in pulling the sleeves by working from behind and holding the gown from the inside . 9. The gown is then fastened at the neck by the circulating nurse and the open edge are then folded or held together. 10. the waist ties are then fastened by the circulating nurse from behind. The isolation gowns should be used only once and then discarded. The older practice of re-using gowns is no longer recommended.		

Summary and evaluation (5 Min) :

- List the steps of hand washing.
- Difference between Medical & Surgical Asepsis.
- Which method used in the prevention of infection.

Assignment:-

List and explain the various method used in surgical and medical asepsis.

Evaluation:-

Unit test for 50 marks once the unit VIth is completed

Bibliography:-

1. Text book of principles and practice of nursing, Author –Sister Nancy, Ninth edition, Published by N.R. brothers, Page no. 31-52.
2. Text Book of Fundamental of nursing, Author- Dinesh Sharma, First Edition, Published by Jain Book depot, Page no. 105-125.
3. www.google.com

LESSON PLAN

Subject : Bio science & Microbiology
Unit : V
Topic : **Bio-safety & waste management**
Group : GNM 1st year
Place : CLASSROOM
Date & Time : …….
Teaching Method : Lecture with PPT
AV aids : Black board & PPT
Students Pre requisite : The student should be able to identify the waste material. All the infectious Waste material Segregate in proper manner.

General objectives : At the end of the class Student will be able to gain knowledge regarding Bio-safety & waste Management

Specific Objectives:

1. To define Bio-waste material
2. To explain the type of waste treatment
3. To describe the Treatment technique for waste material
4. To Detail about Universal precaution

Review of previous class:-Ask questions regarding bio waste management and medical and surgical asepsis.

Introduction:

Ask the student if they know about the universal precautions & color coding bags.
Also mention the objective of the students here

S. No.	Duration	Specific objective	Content	Teaching Learning	Evaluation
1.	10 min.	To define bio-waste material	**Biomedical Waste:** It is the waste that is generated during diagnosis, treatment or immunization of human beings. **Purpose of waste disposal:** • Minimize/Prevent the spread of infection to hospital personnel who handle waste • Prevent the spread of infection to the local community A. **Segregation**  	T:- Define the meaning of Bio-medical waste S: listen carefully	Q. What do you mean by bio-medical waste?

S. No.	Duration	Specific objective	Content	Teaching Learning	Evaluation
2.	15 min.	To explain the type of waste treatment	**B. Collection and Storage**  Wrong  Correct	T:- during Segregation used colour coded bags Explain by Slide S:- Observe & Identify the bag for accurate waste material	Q. Explain the type of waste treatment.

S. No.	Duration	Specific objective	Content	Teaching Learning	Evaluation
			C. Transportation  Wrong  Correct		

S. No.	Duration	Specific objective	Content	Teaching Learning	Evaluation
3.	20 min	To describe the treatment technique for waste material	D. **Treatment and Disposal** **Do's** • Disinfect and destroy the waste before its final disposal • Remember biological waste is to be buried deep at the sub-Centre • Syringes to be cut with hub cutters and chemically disinfected at source of generation before final disposal into sharps pit located at the PHC **<u>Treatment techniques for waste material:</u>** **1. Double Chambered incineration:** • It contains two chambers. • Waste is burnt in primary chamber at 800^{o}C. • Combustion of gases emitted from the first chamber, occurs in the second chamber. • This chamber has a high temperature of 1000^{o}C. • The negative pressure is maintained inside the incinerator by the system, thereby forcing the end gases out of the chimney. Body parts, animal waste, microbiological waste and soil dressings can be treated with this technique. **2. Autoclaving:** • Autoclaving is used for microbiological waste, blood	T:- Explain the technique used for treatment of waste material S:- Learned the technique for treatment of waste material.	Q. How you treat the waste material in ward?

S. No.	Duration	Specific objective	Content	Teaching Learning	Evaluation
			and blood products, body fluids and used sharps. • It is not recommended for pathological waste. **3. Microwaving:** • The microwave heats the waste to temp of 97-100^{o}C. • Cycle time is 40-45min. • It has advantage of disinfecting the waste and there are no hazardous emissions. • However it can't be used to treat body parts and tissues. **4. Hydroclaving:** • It is an expansion of autoclave technology. • Steam is introduced in the hollow walls of the hydroclave. • The steam doesn't come in direct contact with the waste. • Volume reduction of waste is much more than autoclave. • Cycle time is 1hr. • The waste can be safely recycled or land filled. • All items including pathological waste can be treated. **5. Chemical treatment:** It ensures disinfection. 1% hypochlorite solution or any other equivalent chemical		

S. No.	Duration	Specific objective	Content	Teaching Learning	Evaluation
4.	10 min.	To detail about universal precautions	reagent may be used. **Disposal:** • Land filling, deep burial and sewage are used for disposal. • Liquid waste can be disposed in sewage drains. • Besides treatment incineration is also a method of disposal. **<u>Bio-Safety (Universal precautions):</u>** 1. Assume that all patients are potentially infectious for HIV and other blood borne pathogens. 2. All body fluids should be placed in leak proof bags for transportation to the lab. 3. Use gloves while handling blood and body fluid specimens and other objects, exposed to them. Use face mask with goggles. 4. Wear gown while working in the ward. 5. Never pipette by mouth. Mechanical pipetting devices should be used. 6. Decontaminate the ward work surfaces with an appropriate disinfectant. 7. Limit use of needles and syringes to situations for which there are no other alternatives. 8. Biological safety hoods should be used during laboratory work. 9. All the potentially contaminated materials of the laboratory should be decontaminated before disposal or reprocessing.	T:- All PPE Are used During procedure and remember all universal precautions S:- strictly follow all PPE during procedure	Q. Enlist the universal precaution.

S. No.	Duration	Specific objective	Content	Teaching Learning	Evaluation
			10. Always wash hands after & before procedure.		

Summary and evaluation (5 min.):

- Explain the various techniques used for waste material treatment.
- What is the Universal precaution used during procedure.
- What are the colour coding bags used for waste material.

Assignment:-

- List & Explain the Various technique & the universal precautions used for waste material.

Evaluation:-

- Unit test for 50 marks once the unit VIth is completed.

Bibliography:

LESSON PLAN

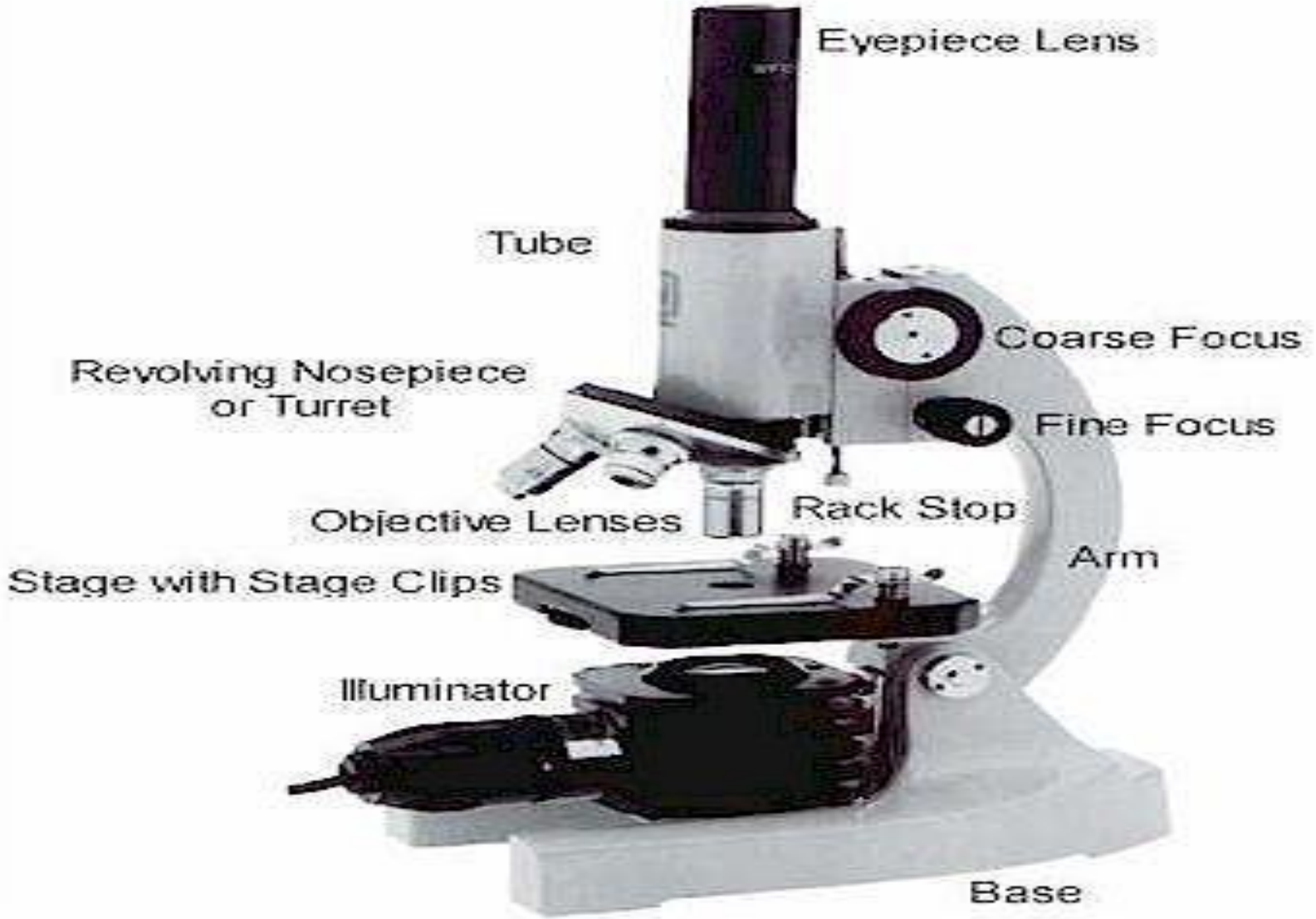
Subject : Bio-science & micro biology
Unit : VI
Topic : **Microscope -Parts, Uses, Handling & Care of Microscope**
Group : G.N.M 1st year students
Place : CLASSROOM
Date & Time : …….
Teaching Method : Lecture and demonstration method
AV aids : Projector
Students Pre requisite : The Student should be able to describe the uses of microscope
General objectives : At the end of the class student will be able to gain knowledge regarding microscope parts, handling & Care of Microscope
Specific Objectives : - At the end of the class students will be able to:-

1. To Define and explain the parts of microscopes.
2. To demonstrate and describe the handling of microscope
3. To explain the care of microscope
4. To discuss the use of Microscope.

Review of previous class:-Ask question regarding microorganism and importance of microscope

Introduction: Show the microscope and ask the students how many parts they know .

S. No	Duration	Specific Objective	Content	Teaching Learning Activity	Evaluation
1.	15 min	To Define and explain the part of microscope	**Microscope** An optical instrument used for viewing very small objects, such as mineral samples or animal or plant cells, typically magnified several hundred times. **Parts of Microscope:-** Eyepiece Lens Tube Arm Base Illuminator Stage Revolving Nosepiece Objective lenses Rack Stop Condenser Lens Diaphragm or Iris	T:- Define the microscope S:- Listen carefully T:- Explain the part of microscope visualize in instrument S:- Observe and practice on microscope	Q:- demonstration with the help of role playing how to give instruction of use of microscope


Eyepiece Lens
Tube
Coarse Focus
Revolving Nosepiece
or Turret
Fine Focus
Objective Lenses
Rack Stop
Arm
Stage with Stage Clips
Illuminator
Base

Summary and evaluation:- (10 min)

- List the part of microscope
- care of microscope during handling
- Demonstrate the microscope

Assignment:-

- Handle the microscope in the laboratory(check during round) (45 Min)

Evaluation:-

- Unit test for 50 marks once the unit VIth is completed

Bibliography:-

1. Textbook of micro biology, Author – Professor C.P.Baveja 2nd edition, Arya Publication , Page no-10-11

LESSON PLAN

Subject : Bio science (Microbiology)

Unit : VI

Topic : **Observation of staining procedure, preparation & examination of slides and smears.**

Group : G.N.M 1st year

Place : CLASS ROOM

Date & Time : ……

Teaching Method : Lecture cum demonstration

AV aids : Black board & chalk

Students Pre requisite : The student should be able to identify the slides and smears and preparation of the slides

General objectives: At the end of the class student will be able to gain knowledge regarding observation of staining procedure.

Specific Objectives:-

1. To explain the Gram staining method.

2. To difference between Grams positive And Gram negative bacteria.
3. To discuss methods of acid fast stains.
4. To explain stain preparation
5. To describe common staining technique

Review of previous class : Ask question regarding microscope and how to use microscope

Introduction: Ask the students if they know about observation of staining procedure, examination of slides and smears.

S. No.	Duration	Specific objective	Content	Teaching Learning	Evaluation
1.	25 min.	To explain the Gram staining method.	**Gram's stain:-** It is the most widely used stain in Bacteriology. The stain was originally devised by the histologist Christian Gram (1884) as a technique of staining bacteria in tissue. **Method:-** • Heat fixed smear of the specimen or bacterial culture is stained with crystal violet (primary stain) for one minute. Other paraosaniline dyes such as gentian violet or methyl violet may also be uses as primary stain. • Pour Gram 's iodine (dilute solution of iodine) over the slide for one minute. • Wash the smear with water • Decolorize with acetone for 10-30 seconds. Alcohol can be be substituted for acetone. • Wash the smear with water • Counterstained with a dye safranin for 30 seconds. Dilute carbol fuchsin or Neutral red may also be used as counter stain.	T: - explain the Gram stain method. S:- Learn & show in the Lab	Q: - Do you know about Gram Staining.

S. No.	Duration	Specific objective	Content	Teaching Learning	Evaluation
2.	20 min.	To difference between Gram positive And Gram negative bacteria.	**<u>Differentiation on Gram staining:-</u>** Two broad groups :- - Gram positive - Gram negative <u>Gram Positive:-</u> Resist decolourisation and retain the colour of primary stain i.e. violet <u>Gram Negative:-</u> Are decolorized by acetone/alcohol and ,therefore, take counter stain and appear red.	`T:- By the Gram staining Method difference between Gram Positive & Gram negative bacteria. S:- Learn & Listen carefully	Q. Explain the Gram staining method Q. difference between Gram positive bacteria and Gram negative bacteria
3.	10 min.	To discuss methods of acid fast stains.	**<u>Acid Fast Stain (Ziehl-neelsen Stain):-</u>** The acid fast stain was discovered by ziehl & Neelsen. Staining of microbacteria(usually tubercle & lepra bacilli) is done by this technique.	T:-Lecture cum demonstration S:-listen and	Q. Describe method of acid fast staining

S. No.	Duration	Specific objective	Content	Teaching Learning	Evaluation
			Method:- • The carbol fuchism stain is poured on slide containing fixed smear.gentle heat is applied to the under side of the slide , by means of a spirite flame, until the stain just commences to steam. The carbol fuchsin is left on the slide for 5-10 min, with intermittent heating during that period. Care must be taken to ensure that the stain does not dry out, to counteract drying more solution of stain is added to the slide & the slide reheated. Heating of the stain is required for penetration of dye into the cell wall. • Wash in tap water. • The stained smear is decolorized with 20% Sulphuric acid and washed with water. This step should be repeated till the pink/red colour stops coming out. In case of lepra bacilli 5% sulphuric acid is used as M. leprae is less acid fast. Another alternative for decolourisation is acid alcohol (3ml HCl and 97 ml ethanol). • The smear is counterstained with2% methylene	see the technique	

S. No.	Duration	Specific objective	Content	Teaching Learning	Evaluation
4.	10 min.	To explain stain preparation	blue for 1-2 minute. Malachite green can also be used as counter stain instead of methylene blue. • Wash with water and air dry. <u>Microscopic Examination Of the Smear:-</u> Acid fast bacilli appear red (colour of carbol fuchsin) in the blue (colour of methylene blue) background of pus cell and epithelial cells. **<u>Stained Preparation:-</u>** Structural detail of bacteria cannot be seen under light microscope due to lack of contrast. Hence it is necessary to use staining method to produce colour contrast Smear made from bacterial culture or specimen is first dried and then fixed with by flaming the slide from underneath. Heat kills and fixes the bacteria on slide due to coagulation of bacterial proteins. The fixed smear is stained by appropriate staining technique.	T:- explain the stain preparation & Staining Technique. S:- Listen Carefully and take notes	Q. Explain the procedure of stain preparation

S. No.	Duration	Specific objective	Content	Teaching Learning	Evaluation
5.	15 min	To describe common staining techniques.	**Common Staining Technique:-** 1. **Simple stains:-** basic dyes such as methylene blue are used as simple stain . They provide the colour contrast, but impart the same colour to all the bacteria in a smear. 2. **Negative Staining**:- bacteria are mixed with dye such India ink. The background gets stained and unstained bacteria stained out in contrast .this is very useful in the demonstration of bacterial capsules which do not take simple stain. 3. **Impregnation method**:-bacterial cell and structure that are too thin to be seen under the light microscope, are thickened by impregnation of silver on the surface to make them visible . Example; demonstration of bacterial flagella and spirochaetes 4. **Differential stain:-** they impart different	T:- Lecture method S:-listen	Q. enlist the common staining technique

S. No.	Duration	Specific objective	Content	Teaching Learning	Evaluation
			colors to different bacteria or bacterial structures. The two most commonly employed differential stains are the Gram stain and acid fast Stain.		

Summary and evaluation:- (10 MIN)

- Explain all Staining method for identification of the bacteria.
- Ask the Ziehl-Neelson Staining method.

Assignment:-

Explain the Staining Preparation.(30 Min)

Evaluation:-

Unit test for 50 marks once the unit VIth is completed.

Bibliogra phy:-

1. Text book of microbiology, Author – C.P.Baveja , Second edition, Arya publication , Page no. 11-14
2. Text book of microbiology , Author- R.Ananthanarayan & C.K. Jayaram Paniker, 6th Edition, Page no. 9- 11

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LESSON PLAN

Subject	: Bioscience (Microbiology).
Unit	: VI
Topic	**: Identification of common Microbes Under the microscope for morphology of different microbes**
Group	: GNM 1st year
Place	: CLASSROOM
Date & Time	: ……..
Teaching Method	: Lecture Method and demonstration
AV aids	: Black board & chalk, microscope and specimens slides
Students Pre requisite	: The students should be able to preparation of staining and handling of microscope
General objectives	: At the end of the student will be able to gain knowledge regarding morphology of different microbes & Identification of common microbes

Specific Objectives: - At the end of the class students will able:-

1. To describe morphology of bacteria
2. To discuss Morphology of viruses

Review of previous class:-Ask question regarding staining and microscope

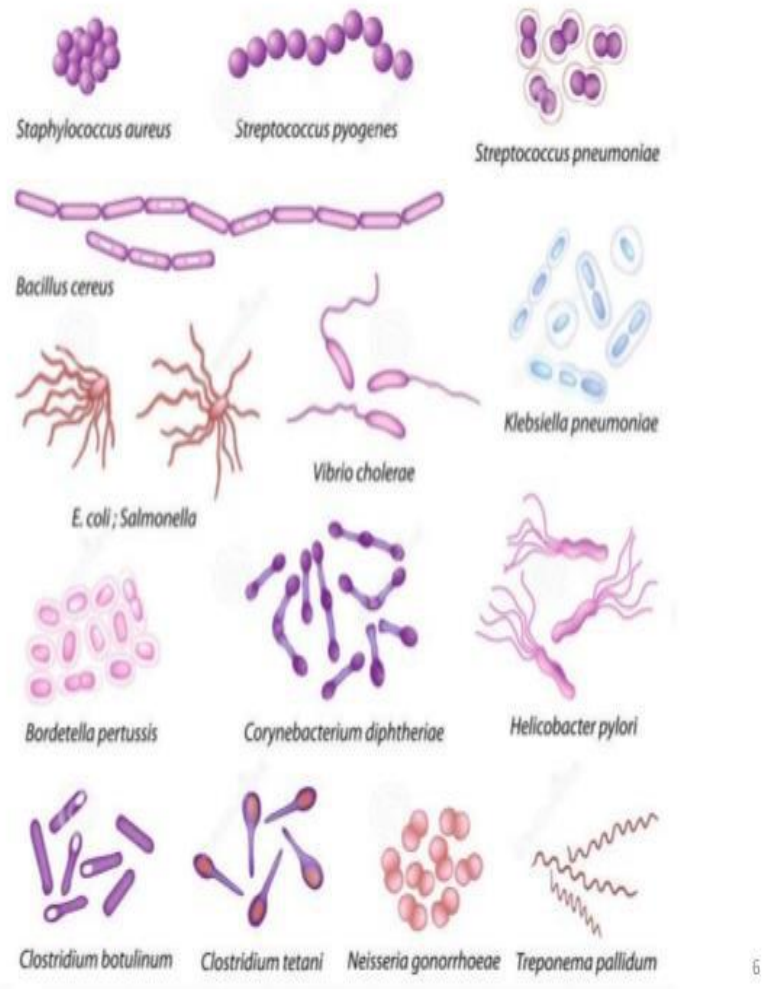
Introduction:

Ask the student if they know about any one bacterial morphology

Also mention the objective of the lesson to the students here

S. No.	Duration	Specific objective	Content	Teaching Learning	Evaluation
1.	30 min	To Describe morphology of bacteria	**Morphology of bacteria:-** Depending on their shape, bacteria are classified into several types :- 1. **Cocci (From kokkos, meaning berry)**:- these are oval or spherical cells . these cocci may be arranged in pairs(diplo cocci), chains(streptococci), clusters(staphylococci) & group of Four (Tetrads) or Eight (sarcina). 2. **Bacilli (bacillus , meaning rod):-** these are rod shaped cells. Some of these bacilli may be having peculiar arrangement or shape as follows:- (a) Coccobacilli:- length of bacteria is approximately same as it's width e.g. brucella. (b) Streptobacilli:- these bacilli are arranged in chain e.g. streptibacillus (c) Chinese letter or cuneiform pattern :- Arranged at angles to each other e.g. Corynebacterium (d)Comma Shaped:- curved appearance e.g. Vibrio (e) Spirilla:- rigid spiral form e.g. spirillum	T:- Classify bacteria on the basis of their Shapes. S:- learn and Listen carefully	Q:- classify in detail the morphology of bacteria.

S. No.	Duration	Specific objective	Content	Teaching Learning	Evaluation
			3. **Spirochaetes (from spiera meaning coil; chaite meaning hair):-** These are slender,flexous spiral forms e.g. treponema 4. **Actinomycetes(from actis meaning ray, mykes meaning fungus):-** These are branching filamentous bacteria resembling fungi. They have a rigid cell wall 5. **Mycoplasmas:**- these bacteria are cell wall deficient and hence do not possess a stable shape. They may occur as round or oval bodies and as interlacing filaqments. They are very small in size (50-300 nm in diameter) . they can reproduce in cell free medium. **6. Rickettsiae & Chlamydiae:-** These are very small, obligate parasites , due to their inability to grow outside living cell, they were previously considered as virus. Now they are classified as bacteria because of typical bacterial cell wall, possession of various bacterial enzymes and structural similarities with bacteria.		

S. No.	Duration	Specific objective	Content	Teaching Learning	Evaluation
					
2.	20 min	To discuss Morphology	**Morphology of viruses:-** Viruses are much smaller than other	T:- Discuss in detail	Q. Describe

Summary and evaluation:- (10 MIN)

a. List all Bacteria according to their Morphology.
b. Discuss the morphology of Viruses.

Assignment:_

1. List the bacterial names
2. List the viruses names

Evaluation:-

Unit test for 50 marks once the unit VIth is completed.

Bibliography:-

1. Textbook of Microbiology , Author – C.P.Baveja , Second Edition , Arya publication, Page no. 13-14 & 405-407
2. Text book of microbiology , Author – R. Ananthanarayan & C. K.Jayaram Paniker, Fifth edition ,
    a. Page no. 10-11 & 399-400.
3. www.google.com

LESSON PLAN

Subject : Anatomy and Physiology

Unit : 1

Topic : **Introduction to anatomy**

Group : GNM IST year

Place : CLASS ROOM

Date& time :

Teaching method : Lecture cum discussion

A v aids : black board and chalk, chartss

Students Pre Requisite : The students should be able to understand the basic concept of anatomy

General objective : At the end of the class student will be able to gain knowledge about their own body structure

Specific objectives: At the end of the class the students will be able to:-

1. Define anatomy
2. Enumerate various subdivision of anatomy
3. Tell about the various anatomical position and planes
4. Know about various level of organization

Review of previous class**:** Ask questions regarding the previous knowledge about human body, its functions etc.

Introduction:- Today we will discuss about the anatomy of human body.

S No	Duration	Specific objective	Content	Teaching Learning Activity	Evaluation
1	5min	To introduce the topic	**Introduction**:-Anatomy is the study of structure and function of the body. Aristotle was the first person to use the term "anatome", a greek word meaning "cutting up or taking apart". Anatomy is one of the oldest basic medical sciences. It was first studied formally in Egypt. Human anatomy was taught in Greece by Hippocrates, who is known as "father of medicine".	T: explain with lecture S:Listen and take notes	Q: Define anatomy and its origin?
2	10min	To explain about its subdivision	**Subdivision of anatomy** ▪ **Clinical anatomy** Correlation of anatomy with clinical signs and symptoms to arrive at diagnosis is clinical anatomy ▪ **Gross anatomy** It is the study of structure of human body usually with naked eyes. ▪ **Systemic anatomy** It is the study of the body system ▪ **Regional anatomy** Study of structure and organization of a definitive part of the various Parts of body e.g. Thorax. Back etc. ▪ **Functional anatomy** Study of anatomy which provides correlation between structure& Function of various organs. ▪ **Developmental anatomy** Study of prenatal and postnatal developmental changes of the human Body ▪ **Histology and Cytology**	Lecture cum discussion	Q:List out various subdivision of anatomy?

S No	Duration	Specific objective	Content	Teaching Learning Activity	Evaluation
			Study of various body structure organs ,tissues and cells ▪ **Surface anatomy** Study of projection of internal body parts on the corresponding external Surface area of the body. ▪ **Clinical anatomy** Study of entire body or its part in relation to the practice of medicine ▪ **Comparative anatomy** Study of structural variation between other animal and human.		
3	10min	To explain anatomical position	**Anatomical position** A person in the anatomical position is standing erect with the head Eyes and toes directed forward, the upper limbs by the sides with The palms facing anteriorly. **Other position** ➢ SUPINE POSITION Person lies straight on the back with face directed upwards. ➢ PRONE POSITION Person lies straight on the abdomen and face is directed downwards	T: explain with chart S: observe and take notes	Q:What do mean by anatomical position?
4	10min	To explain anatomical planes	**Anatomical planes** Anatomical description are also based on four imaginary planes that Pass through the body in the anatomical position. They are ➢ MEDIAN PLANE	T: Explain with PPT S: Observe and take	Q:List out various anatomical planes

S No	Duration	Specific objective	Content	Teaching Learning Activity	Evaluation
			This is the imaginary vertical plane passing longitudinally through the body From front to back, dividing it into right& left halves ➢ SAGITTAL PLANE These are parallel to the median plane .They are named after the sagittal Suture of the skull ➢ CORONAL PLANE These are imaginary vertical planes passing through the body at right Angles to the median plane, dividing it into front and back portion. These planes are named after coronal suture. ➢ HORIZONTAL/TRANSVERSE PLANE These are imaginary planes passing through the body at right angles to Both the median and coronal planes. It divides the body into upper and Lower parts.	notes	
5	15min	To explain level of organization	**<u>Level of organization</u>** For clear understanding of the body and its function ,it is important to know The organization of the body. They are:- ➢ CHEMICAL LEVEL The smallest unit of a body is an atom, when two or more atoms joined together called as a molecule. ➢ CELLULAR LEVEL Molecules combine to form cells, which are basic functional and	T: explain with posters S: observe, listen and take notes	Q: what are the level of organization?

S No	Duration	Specific objective	Content	Teaching Learning Activity	Evaluation
			structural Unit of an organism. ➢ TISSUE LEVEL Groups of cells that work together to perform a particular function are called tissue. ➢ ORGAN LEVEL Different types of tissues join together to form an organ. ➢ SYSTEM LEVEL A system consist of related organs with a common function		

Summary& evaluation(10min)

1. How will you get the knowledge regarding your own body?
2. List out various subdivision of anatomy.
3. How does our body form at various level of organization?

Assignment: Define anatomy and explain various anatomical planes?

Evaluation: unit test for 50 marks once the unit I^{ST} is completed

Bibliography:

1. Pr ashalatha, g deepa,textbook of anatomy& physiology for nurses,4^{th} edition,2015,jaypee brother,page 4-5

LESSON PLAN

Subject : Anatomy and Physiology

Unit : 1

Topic : **Introduction to anatomical Terms**

Group : GNM IST year

Place : CLASS ROOM

Date& time :

Teaching method : Lecture cum discussion

A v aids : black board and chalk, charts

Student pre requisite : The students should be able to know the various anatomical terms.

General objective : At the end of the class the students should be able to gain knowledge regarding the anatomical terms.

Specific objective : at the end of the class the students will be able to :

1. List all the anatomical terms.
2. Explain each anatomical term.

Review of previous class- student verbalise the various anatomical term.

Introduction :

S.no	Duration	Specific objective	Content	Teaching &learning activity	Evaluation
1.	05 MIN.	To introduce the topic	**Introduction** : Anatomy is the study of structure and function of the body.In this topic , we will discuss about the various anatomical terms, their meaning ,and examples .	T:explain with lecture S: listen and take notes	Q: Define the term Anatomy?
2.	20 Min.	To explain commonly used anatomical trems of relationship their meaning & examples	List of the anatomical trems 1- **Superior** (cranial):means nearer to the head **Example**: the lung is superior to the diaphragm 2- **Inferior (caudal):** nearer to the feet (tail) **Example:**the stomach is inferior to the heart 3- **Anterior (ventral):** nearer to the front **Example**:cornea is anterior to the lens 4- **Posterior (dorsal**): Nearer to the back **Example:**lens is posterior to the cornea 5- **Medial :** Nearer to the median plane **Example**:heart is median to the lung. 6- **Lateral** : away from the median plane **Example** : kidney is lateral to the vertebral column 7- **Proximal :** nearer to the trunk or point of origin **Example**: the knee is Proximal to the ankle. 8- Distal : farther from the trunk or away from the origin Example: the wrist is distal to the elbow. 9- **Superficial:** nearer to the surface **Example**: muscle of the thigh are superficial to the bone femur.	T:explain with lecture and chart S: listen and take notes	Q: Explain commonly used anatomical trems of relationship their meaning & examples?

S.no	Duration	Specific objective	Content	Teaching &learning activity	Evaluation
			10 **Deep**: farther from the Surface. **Example:** farther from the surface the femur is deep to the muscles of the thigh. 11 **external (outer**) : Toward the exterior **Example:** the sclera is the external coat of the eyeball. 12 **Internal (inner**) : Toward or in the Interior. **Example**: retina is internal to the sclera and choroid.		
03	25 min	To explain anatomical terms of movement	**List of the anatomical terms of movement:** 1- **Flexion** – in this movement, to flexor surfaces come in approximation & angle of the joint is reduced 2- **Extension**- in this movement there is approximation of extensor surfaces whereby angle of joint increases 3- **Abduction** – it describes the movement away from the median plane, away from the middle finger in head or away from the second toe in foot. 4- **Adduction-** This describe the movement towards the median plane or toward the middle finger in hand or toward the second toe of foot. 5- **Medial rotation**: it denotes movement toward median plane or inward rotation 6- **lateral rotation:** it denotes rotation away from the median plane or outward rotation 7- **Circumduction:** combined movement of flexion,	T:explain with lecture and chart S: listen and take notes	Q: Explain commonly used anatomical terms of movement ?

S.no	Duration	Specific objective	Content	Teaching &learning activity	Evaluation
			extension, adduction & abduction in a circular manner is termed as circumduction. 8- **Elevation**- raising or moving a bady part toward the cephalic end is termed as elevation. 9- **Depression**- lowering or moving a body part caudally is termed as depression. 10 **Protrusion**- it is the forward movement of a body part. 11 **Retraction-** it is the backward movement from protrusion 12 **pronation**- it is the medial rotation of fore arm so that the palm comes to face backward . 13 **Supination**- it is the lateral rotation of fore arm so that the palm comes to face anteriorly. 14 **Inversion of foot-** it is the movement that causes the plantar surface of foot to face inward & downward 15 **Eversion of foot**- it is the movement that causes the plantar surface of foot to face laterally & downward 16 **Opposition**- it is a combination of abduction, medial rotation & flexion. This movement characteristically occurs in the thumb.		

Summary & evaluation : (10 min.)

1. Enlist the various anatomical trems of relationship & their example.
2. Enlist the various anatomical trems of movement.

Assignment : Enlist and describe the various anatomical trems of relationship & movement

Evaluation : unit test for fifty marks once the unit 1st is completed.

Bibliography :

1. Ashalatha pr, deepa g, Text book Anatomy &Physiology for nurses, 4th edition, 2015, Jaypee brothers, pgs 7-9

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LESSON PLAN

Subject : Anatomy and Physiology

Unit : 1

Topic : **Introduction systems of human body**

Group : GNM IST year

Place : CLASS ROOM

Date& time :

Teaching method : Lecture cum discussion

A v aids : black board and chalk, chartss

Student pre requisite : The students should be able to know the various systems of human body

General objective : At the end of the class the students should be able to gain knowledge regarding the systems of human body

Specific objective : At the end of the class the students will be able to :

1. List all the systems of human body.
2. Enlist constituents & functions of systems of human body.

Review of previous class - student verbalise the systems of human body

Introduction :

Today we will discuss about the systems in our body. How they work effectively as a unit.

S.no	Duration	Specific objective	Content	Teaching &learning activity	Evaluation
1.	05 MIN.	To introduce the topic	**Introduction** : **Anatomy** is the study of structure and function of the body.In this topic , we will discuss about the various systems of human body. **Physiology** is the branch of science that deals with various functions of living organisms and the process which regulate them.	T:explain with lecture S: listen and take notes	Q: Define the term Anatomy?
03	35 min	To list out the constituents and functions of systems of human body	List of the constituents & functions of systems of human body. **1- INTEGUMENTARY SYSTEM** CONSTITUENTS: • Skin • Hair • Nails FUNCTION:skin is a major sensory organ responsible for: • Protection of body. • Regulation of the temperature. • Elimination of waste **2- SKELETAL SYSTEM** CONSTITUENTS: • Bones • Joints • Associated cartilages	T:explain with lecture S: listen and take notes	Q: Enlist the constituents and functions of systems of human body?

S.no	Duration	Specific objective	Content	Teaching &learning activity	Evaluation
			FUNCTION: • Provides support and protection to body. • Helps in body movements **3- <u>MUSCULAR SYSTEM</u>** CONSTITUENTS: • Main are skeletal muscle. • Smooth muscles. • Cardiac muscles. FUNCTION: • Skeletal muscle help in body movements. • Maintenance of posture. • Production of heat. **4- <u>NERVOUS SYSTEM:</u>** CONSTITUENTS: • Brain • Spinal cord • Nerves • Special sense organs like eyes, ear FUNCTION: • Regulation of body activities & body's internal and external environment by nerve impulses		

5- ENDOCRINE SYSTEM:

S.no	Duration	Specific objective	Content	Teaching &learning activity	Evaluation
			CONSTITUENTS: • Hypothalamus • Pituitary gland • Thyroid gland • Pineal gland • Parathyroid gland • Pancreas • Ovaries/Testes • Adrenal glands FUNCTION: • Regulation of body activities by releasing hormones **6- URINARY SYSTEM:** CONSTITUENTS: • Kidneys • Ureters • Urinary bladder • Urethra FUNCTION: • Production, storage and elimination of urine • Regulation of volume & chemical		

S.no	Duration	Specific objective	Content	Teaching &learning activity	Evaluation
			composition of blood. • Maintenance of acid – base balance of the body. **7- <u>CARDIOVASCULAR SYSTEM</u>** CONSTITUENTS: • Heart • Blood vessels-arteries and veins • Blood FUNCTION: • Heart pumps the blood through the blood vessels • Blood carries oxygen & nutrients to the cells and takes away the wastes and carbon –dioxide from the cells. **8- <u>LYMPHATIC SYSTEM:</u>** CONSTITUENTS: • Spleen • Thymus gland • Tonsils • Lymph nodes • Lymphatic vessels FUNCTION: • Return proteins & fluids to the blood		

S.no	Duration	Specific objective	Content	Teaching &learning activity	Evaluation
			• Removes bacteria, toxins & other foreign bodies from tissue • Lymph serves as an important route for intestinal fat absorption • Sites of maturation and proliferation of B and T cells. **9- <u>RESPIRATORY SYSTEM:</u>** CONSTITUENTS: • Pharynx • Larynx • Bronchial tubes • Trachea • lungs FUNCTION: • transfer of oxygen from inhaled air to blood & carban – dioxide from blood to exhaled air • Regulation of acid – base balance of the body fluids. **10- <u>DIGESTIVE SYSTEM</u>** CONSTITUENTS: • Mouth • Pharynx		

S.no	Duration	Specific objective	Content	Teaching &learning activity	Evaluation
			• Esophagus • Stomach • Small & large intestine • Salivary glands • Liver • Gall bladder • Pancreas FUNCTION: • Digestion of food. • Absorption of nutrients. • Elimination of waste. **11- <u>REPRODUCTIVE SYSTEM:</u>** **(A)<u>FEMALE REPRODUCTIVE SYSTEM:</u>** CONSTITUENTS: • ovaries • Uterine tubes • Uterus • Vagina • Mammary glands FUNCTION: • Production of gametes • Release of hormones that regulate		

S.no	Duration	Specific objective	Content	Teaching &learning activity	Evaluation
			reproduction & help in development of secondary sexual characteristics. • Mammary glands are for lactation. **(B)<u>MALE REPRODUCTIVE SYSTEM:</u>** CONSTITUENTS: • Testes • <u>Ductus deferens</u> • Seminal vesicles • Prostate gland • penis FUNCTION: • production of gametes. • Release of hormones that regulate reproduction & help in development of secondary sexual characteristics. • Penis is the main copulatory organ.		

Summary & evaluation : (10 min.)

1. Enlist the various systems of human body.
2. Enlist the constituents & functions of systems of human body.

Assignment: Enlist the constituents & functions of systems of human body.

Evaluation : unit test for fifty marks once the unit 1st is completed.

Bibliography :

1. Ashalatha pr, eepa g, text book anatomy &physiology for nurses, 4th edn, 2015, jaypee brothers, pgs 12-17

LESSON PLAN

Subject : Anatomy and Physiology

Unit : 1

Topic **:** Introduction Cavities Of Human Body

Group : GNM IST year

Place : CLASS ROOM

Date& time :

Teaching method : Lecture cum discussion

A v aids : Black board and chalk, charts, poster, ppt

Students pre requisite: the students should be able to understand the basic spaces in our body

General objective: at the end of the class student will be able to gain knowledge about various cavities of human body

Specific objectives: at the end of the class the students will be able to

1. Define cavity
2. List out various cavities of our body
3. Explain about boundaries, contents of cranial cavities
4 Explain about boundaries, contents of Thoracic cavities
5. Explain about boundaries, contents of abdominal cavities
6. Explain about boundaries, contents of Pelvic cavities

Review of previous class: Ask questions regarding the previous knowledge about anatomy, position and various Planes.

Introduction:

Ask the student if they know any one of cavity of the human body

also mention the objectives of the lesson to the student here

S no	Duration	Specific objective	Content	Teaching learning activity	Evaluation
1	5min	To define cavity	**Introduction** **B**ody cavities are spaces within the body that help, protect, separate and support internal organs. Bones muscles, ligaments, and other structures separate the various body cavities from one another.	Lecture cum Discussion	Q:what do you mean by Body cavities?
2	5min	To list out various cavities of our body	**cavities of body** 1. **Cranial cavity** 2. **Thoracic cavity** 3. **Abdominal cavity** 4. **Pelvic cavity**	T:write down on black board S:watch and note down	Q:list out various body cavities
3	10min	To explain cranial cavity	**A. cranial cavity** the 8 fused cranial bones form a hollow space of the head called cranial cavity. They are:- ➢ Frontal bone anteriorly ➢ Occipital bone posteriorly ➢ Sphenoid and ethmoid bones inferiorly ➢ Parietal bone superiorly ➢ Temporal bone laterally The cranial cavity is occupied by the brain	T:explain with Poster S:observe and Take notes	Q:list out the bones which Form the cranial cavity?

S no	Duration	Specific objective	Content	Teaching learning activity	Evaluation
4	10min	To explain thoracic cavity	**B. thoracic cavity** **boundaries** ➢ Anteriorly: sternum and ant. Part of ribs and their costal cartilages ➢ Posteriorly: bodies of the 12 thoracic vertebrae & post. Parts of ribs ➢ On each side: 12 pairs of ribs & the intercostals muscles ➢ Superiorly: by the structures forming the root of the neck ➢ Inferiorly: by a muscular sheet known as diaphragm **contents** the main organs in this cavity are:- ✓ Trachea, bronchi(2), lungs ✓ Heart , aorta (sup.& inf. Both) ✓ Esophagus ✓ Lymph vessels ✓ Nerves	T: explain with ppt S: observe and take notes	Q:explain the various boundaries of thoracic cavity?

S no	Duration	Specific objective	Content	Teaching learning activity	Evaluation
5	10min	To explain abdominal cavity	**C. abdominal cavity** it is the largest cavity in the body. for purposes of description, the abdominal cavity is divided into 9 regions by two lateral vertical planes and two horizontal planes. nine regions of abdomen:- 1. Epigastric/epigastrium 2. Rt hypochondrium 3. Lt hypochondrium 4. Umbilical 5. Rt lumber 6. Lt lumber 7. suprapubic/hypogastrium 8. Rt iliac fossa/rt inguinal region 9. Lt iliac fossa/lt inguinal region **boundaries** ✓ Superiorly: the diaphragm which separates it from thoracic cavity ✓ Inferiorly: it is cont.with pelvic cavity ✓ Anteriorly: anterior abdomen wall ✓ Posteriorly: lumber vertebrae & post. Abdomen wall ✓ Laterally: muscles of abdominal wall and lower ribs **contents** the main organs in this cavity are:-	T:explain with ppt S: observe and take notes	Q:draw a diagram of abdomen and divided it in 9 regions by imaginary lines?

S no	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			✓ Stomach ✓ Small intestine ✓ Most of the large intestine ✓ Liver ✓ Gall bladder and bile duct ✓ Pancreas ✓ Spleen ✓ Kidneys-2,upper part of ureters ✓ Adrenal glands-2 ✓ Numerous blood vessels ,lymph vessels, nerves and lymph nodes		
6	10min	To explain pelvic cavity	**D. pelvic cavity** the pelvic cavity extends from the lower end of the abdominal cavity. **boundaries** ✓ Superiroly: it is cont. With abdominal cavity ✓ Inferiorly: pelvic floor ✓ Anteriorly: pubic bones ✓ Posteriorly: sacrum and coccyx ✓ Laterally: hip bones **contents** the mains organs and structures in pelvic cavity are:	T: explain with ppt S: observe and take notes	Q:list main organs situated in pelvic cavity?

S no	Duration	Specific objective	Content	Teaching learning activity	Evaluation
			✓ Urinary bladder ✓ Lower parts of the ureters ✓ Urethra ✓ Lower part of colon ✓ In male- prostate gland,seminal vesicles, spermatic cord, vas deferens,ejaculatory ducts,and urethra ✓ Im female- uterus, uterine tubes, ovaries, and vagina		

Summary& evaluation(10min)

1. Repeat the definition of body cavities.
2. Let the students verbalise the list of various cavities
3. Enlist the various organs come under different kind of cavities.

Assignment: define body cavity and describe the boundaries of abdominopelvic cavity

Evaluation: unit test for 50 marks once the unit is completed

Bibliography:

1. Ashalatha, g deepa,textbook of anatomy& physiology for nurses,4th edition,2015,jaypee brother,page 20-24

LESSON PLAN

Subject : Anatomy and Physiology

Unit : II

Topic : **The Cell- Structure**

Group : GNM IST year

Place : CLASS ROOM

Date& time :

Teaching method : Lecture cum discussion

A v aids : Black board and chalk, charts

Student pre requisite : The students should be able to know the structure of the cell.

General objective : At the end of the class the students should be able to gain knowledge regarding the structure of the cell.

Specific objective: at the end of the class the students will be able to:

1. To list out the constituents of the cell.
2. To list out the constituents of cell membrane.
3. To list out components of nucleus.
4. To discuss about cytoplasm and various cell organelles.

Review of previous class- student verbalise the basic knowledge regarding structure & function of a cell.

Introduction :

S.no	Duration	Specific objective	content	Teaching &learning activity	Evaluation
01.	05 MIN.	To introduce the topic	**Introduction:** The smallest structural & functional unit of our body is the cell. In this topic we will discuss about the structure of a cell.	T:explain with lecture S: listen and take notes	Q: Define the Term cell?
02.	05 Min.	To List out the constituents of a cell.	A eukaryotic cell consists of the following structure: A Cell membrane or plasma membrane Nucleus. Cytoplasm & organelles.	T:explain with lecture S: listen and take notes	Q: Explain the constituents of a cell?
03	05 min	To list out the constituents of cell membrane	Cell membrane is composed of three types of substances: ➢ Proteins (55 %) – a) Integral proteins b) Peripheral proteins ➢ Lipids (40 %) - a) Phospholipids b) Cholesterol ➢ Carbohydrates (5%)	T:explain with lecture S: listen and take notes	Q: Explain the constituents of cell membrane?

S.no	Duration	Specific objective	content	Teaching &learning activity	Evaluation
04	10 Min.	To list out the components of nucleus	**Three nuclear components are :** 1. Nuclear membrane: the nucleus is covered by a double layered membrane is called nuclear membrane. 2. Nucleoplasm: it is a gel like ground substance and contains large quantities of the genetic material in the form of DNA. 3. Nucleoli: one or more nucleoli are present in each nucleus.	T:explain with lecture S: listen and take notes	Q: Explain the components of nucleus?
05	25 Min.	To discuss about cytoplasm & cell organelles	**CYTOPLASM :** the cytoplasm is the fluid present inside the cell. It contains a clear liquid portion called cytosol which contains various substances like proteins, carbohydrates, lipids and electrolytes. Apart from these substances, many organelles are also present in cytoplasm. **Cell organelles** : list of cell organelles are following as : 1. **Endoplasmic reticulum** : It is made up of tubules and micrisomal vesicles. Type : a) Rough Endoplasmic reticulum :	T:explain with lecture S: listen and take notes	Q: Explain about cytoplasm & cell organelles?

S.no	Duration	Specific objective	content	Teaching &learning activity	Evaluation
			b)Smooth Endoplasmic reticulum Function: Smooth ER synthesis lipids &steroid hormones, Rough ER is concerned with synthesis of proteins. 2. **Golgi Apparatus**: it consists of 5-8 flattened membranous sacs called cisternae.It is situated near the nucleus. Function: It is concerned with the processing and delivery of substances like proteins and lipids to different parts of the cell. 3.**Mitochondria** : it is membrane bound organelle and are called the power-generating units of the Cell. Function: 1. it is the chief site of TCA cycle, electron transport chain and fatty acid Metabolism. 2.Release of energy from ATP and GTP		

S.no	Duration	Specific objective	content	Teaching &learning activity	Evaluation
			4.Membrane bound vesicles : (a) **Phagosomes** : such membranes bound vesicles , containing solid ingested material are called phagosomes. (b**) Pinocytotic vesicles** : the vesicles are formed by the the process of pinocytosis is called pinocytotic Vesicles. (c) **Exocytic vesicle** : Just as material from outside the cell can be brought into the cytoplasm by phagocytosis or pinocytosis, materials from different part of the cell can be transported to the outside by vesicles. Such vesicles are called exocytic vesicles (d**) Lysosomes**: Lysosomes are membrane bound spheroidal bodies containing hydrolase enzymes Capable of degrading a wide variety of substances.		

S.no	Duration	Specific objective	content	Teaching &learning activity	Evaluation
			Function of Lysosomes: digestion of unwanted substances , removal of excess secretory product in cell. (e) **Peroxisomes**: Peroxisomes are small spherical, membrane bound organelle that closely, resemble lysosomes. However they contain entirely different set of Enzymes- oxidases and catalases. (f) **Centrosome** : It is situated near the center of the cell close to the nucleus. It consists of two cylindrical structures called centrioles which are responsible for the Movement of chromosomes during cell division.		

Summary & evaluation: (10 Min.)
1. Enlist the various cell components.
2. Enlist the constituents of various cell organelles & their functions.

Assignment: Enlist the components of cell, cell membrane, nucleus & cytoplasm.

Evaluation : unit test for fifty marks once the unit 2nd is completed.

Bibliography :

1. Ashalatha pr, eepa g, text book anatomy &physiology for nurses, 4th edn, 2015, jaypee brothers, pgs 36-42

LESSON PLAN

Subject : Anatomy and Physiology

Unit : II

Topic **: The cell reproduction and fuction**

Group : GNM IST year

Place : CLASS ROOM

Date& time : ……

Teaching method : Lecture cum discussion

A v aids : Black board and chalk, charts, l.c.d, and computer

General objective **:** At the end of class student will be able to gain knowledge about the cell v reproduction and fuction

Specific objectives: At the end of the class the student will be able:-

1. To understand about cell division
2. To explain about mytosis
3. To explain about meiosis
4. To explain the fuction of cell division

Introduction:

S. No.	Duration	Specific Objective	Content	Teaching Learning activity	Evaluation
3	**15 Mins**	To Explain about meiosis	**<u>MEIOSIS:</u> -** 1. This cell division occur in reproductive cells of body (ovary testes) 2. By the meiosis the no. Of chromosomes half of mother cells in daughter cells 3. by meiosis four daughter cells are forms 4. the stages of meiosis cell division (A) <u>INTERPHAGE</u> :- ➢ G_1 - stage (phase) ➢ S- stage ➢ G_2 - stage ➢ M – stage (B) MITOSIS:- (a) meiosis – I ➢ Prophase -I ➢ Metaphase - I ➢ Anaphase - I ➢ Telophase – I (b)meiosis – II ➢ Prophase -II ➢ Metaphase - II	T: Explain with power point presentation. S: Listen and takes notes	Q: Explain about meiosis.

S. No.	Duration	Specific Objective	Content	Teaching Learning activity	Evaluation
			➢ Anaphase – II ➢ Telophase – II (C) CYTOKYNASIS		
4	**10 min**	To explain the function of cells division.	**<u>FUNCTIONS :-</u>** 1. **<u>Function of mitosis cell division</u>** :- ➢ This cell division in occur in all body eukaryotic cells ➢ The main aim of mitosis is replacement of died cells in maintenance of all body organs. 2- . **<u>Function of meiosis cell division:-</u>** ➢ Production of sperm and ovum. ➢ Fertilization & production of next generation of a species.	T: Explain with power point presentation. S: Listen and takes notes	Q: Explain the function of cell division?

Summary:-

1 Explain about cell division
2 Give the knowledge about mytosis
3 Give the knowledge about meiosis
4 Explain the fuction of cell

Assignment:- Write about the cell reproduction and fuction.

Evaluation:- Class Test of 50 marks after Completion of unit II.

Bibliography:-

1. Rocs and Wilson, Anatomy and Physiology,10th Edition, Churchill Living Stone Elsevier, Edin Burgh, Page no 34-37.

LESSON PLAN

Subject	:	Anatomy and Physiology
Unit	:	II
Topic	:	**Tissue : type, structure and function**
Group	:	GNM IST year
Place	:	CLASS ROOM
Date& time	:	……
Teaching method	:	Lecture cum discussion
A v aids	:	black board and chalk, charts
Student pre requisite	:	The students should be able to know the structure of the cell.
General objective	:	At the end of the class the students should be able to gain knowledge regarding the structure of the cell.

Specific objective : at the end of the class the students will be able to:

1. To explain tissue, organ and system.
2. To list out the different type of tissue.
3. To list out the specialities of different types of tissues and their examples.
4. To discuss the role of the different types of tissues .

Review of previous class - student verbalise the basic knowledge regarding structure & function of a cell

S.No.	Duration	Specific objective	Content	Teaching learning activities	Evaluation
1.		Introduction - tissues and major types	The tissues of the body consist of the large no. of cells and they are classified according to the size, shape and functions of these cells. There are main four types of tissues, each of which has subdivisions. 1. Epethilial tissue 2. Connective tissue 3. Muscle tissue 4. Nervous tissue	Lecture cum discussion	What are tissues?
2.		Epithelial tissue and its classification	• This group of tissues is found covering the body and lining cavities and tubes. • The cells are very closely packed and the intercellular substances, called matrix, is minimal. • The cells usually lie on a basement membrane. • Epithelial tissue may be simple or stratified **A. <u>Simple epithelium-</u>** • Consists single layer of cellsusually found on absorptive or secretory surfaces but never on surfaces subject to stress. • Its types are named according to their functions. The more active the tissue	Lecture cum discussion Charts/ posters	Differentiate all the types of various epithelial tissues.

S.No.	Duration	Specific objective	Content	Teaching learning activities	Evaluation
			taller the cells. • It is divided in four types- **1. Squamous epithelium-** Composed of single layer of flattened cells. The cells fit closely together like flat stones, forming a very smooth membrane. Diffusion take place freely through this thin, smooth, inactive lining of the following structures-heart, blood vessels, Alveoli, lymph vessels. **2. Cuboidal epithelium-** Cube shaped cells. Basement membrane present. Actively involved in secretion, absorption and excretion. Ex- tubules of kidneys, in some glands. 3. **Columnar ephithelium-** Rectangular cells in shape. Basement membrane present. Goblet cells present which secret mucus. Ex- lining of alimentary tract. 4. **Ciliated epithelium-** Columnar cells having hair like projections on the free surface, called cilia.		

S.No.	Duration	Specific objective	Content	Teaching learning activities	Evaluation
			Cilia performs wave like waft movement to give direction to the secretions. Ex- found in the lining of the uterine tube and respiratory tract **B. <u>Stratified or compound epithelium-</u>** Consists of several layers of cells. Basement membrane usually absent. The main function is to protect underlying tissues. These are of two types- stratified squamous epithelium- in the lining of mouth, conjunctiva,pharynx. Transitional epithelium- found in the lining of the urinary bladder.		

S.No.	Duration	Specific objective	Content	Teaching learning activities	Evaluation
3.		Connective tissue- involving cells and various types of connective tissue.	• The cells are widely separated and having intercellular substance, called matrix. • Connective tissue, excluding blood, is found in all organs supporting the specialised tissue. • The different types of cells involved include- Fibroblast, macrophages, plasma cells , mast cells, fat cells etc. • Following are the types of connective tissue- 1. **Areolar tissue –** 2. Adipose tissue 3. Fibrous tissue 4. Elastic tissue 5. Lymphoid tissue 6. Cartilage	Lecture cum discussion Charts / posters	Explain difference b/w epithelial and connective tissue.

S.No.	Duration	Specific objective	Content	Teaching learning activities	Evaluation
4.		Muscle tissue	Three main types of muscle tissue- 1. Skeletal , voluntary or striated muscle 2. Visceral, involuntary or smooth muscle 3. Cardiac muscle **Skeletal muscle-** its contraction is under our will.. microscopically roughly cylindrical in shape. Each cell is commonly called fibre. These fibres are striated having transverse bands of light and dark color. **Visceral muscle-** called as smooth and involuntary muscle. It is not under of our will. Found in the walls of the blood and lymph vessels and other tracts. Cells are spindle shaped with only one nucleus. **Cardiac muscle-** found exclusively in the walls of heart.. it is not under the will of us but microscopically it resembles to the voluntary cells.the fibres of these muscles are nucleated and branched. Branches are in close contacts with other fibre, called intercalated discs. This gives these cardiac muscle a sheath like appearance.	Lecture cum discussion Charts/ posters	Differentiate voluntary and smooth muscles.

S.No.	Duration	Specific objective	Content	Teaching learning activities	Evaluation
5.		Other types of tissues	Nervous tissue Bone tissue Blood These all tissues are important types of tissues which will be discussed in separate unit.	Lecture cum discussion	Is blood also a tissue? What type of tissue is this ?

Summary and evaluation-

In this lesson plan , we discussed the definition of tissue, different types of tissues. The knowledge of different type of tissues help to identify various sites where the different tissues are found . This also ascertain the function of that particular organ in which the tissues are found.

Assignment:

Evaluation-

1. What is tissue? Discuss different types of the epithelial tissues.
2. Enlist all the types of cells involved in formation of connective tissue

Bibliography-

1. Wilson j.w. Kathleen, ross and Wilson anatomy and physiology in health and illness, Churchill livingstone, elbs, 7th edn., 18-25

LESSON PLAN

Subject : Anatomy and Physiology

Unit : II

Topic : **Membranes:- types, structure, and functions**

Group : GNM IST year

Place : CLASS ROOM

Date& time : ……

Teaching method : Lecture cum discussion

A v aids : Black board and chalk, charts, poster, PPT

Students Pre Requisite : The students should be able to understand the various tissues and their role in forming membranes

General objective : At the end of the class student will be able to gain knowledge about all membranes

Specific objectives : At the end of the class the students will be able to

1. To define membranes
2. To explain about their types and structure and various function

Review of previous class : Ask questions regarding the previous knowledge about anatomy, cellular and tissue level

Introduction:-

- Ask the students if they know about any one membrane and function of membrane
- Introduce the topic “Membrane” and
- Also mention the objectives of the lesson to the students here

S No	Duration	Specific objective	Content	Teaching Learning Activity	Evaluation
1	5min	To introduce about topic	**Membranes** Membranes are flat sheets of tissues that cover or line parts of the Body and are typically composed of epithelial cells and connective Tissue. Epithelial cells cover the inner and outer layers of surfaces and form Glands that secrete fluids.	Lecture cum Discussion	Q: What do you mean by membrane?
2	45min	To explain types of membrane and functions	There are five types of membranes found within the body:- 1. MUCOUS MEMBRANE 2. SEROUS MEMBRANE 3. CUTENOUS MEMBRANE 4. SYNOVIAL MEMBRANE 5. MENINGES	T:write down on black board S:watch and note down	Q: List out the types of membranes?
			Mucous membrane Mucous membrane also called mucosa. • It line the inside of cavities that open directly to the exterior environment • It line the GIT, respiratory tract, reproductory tract ,and the urinary tract. • This is composed of an epithelial cell layer and an underlying connective tissue layer. FUNCTIONS:- • It act as a defence layer which prevent the entry of pathogens and microbes into the body. • The cells are tightly packed together, so fluid can't leak through epithelial layer.	T:explain with Poster S:observe and Take notes	Q: what do you know about mucous membrane?

	S No	Duration	Specific objective	Content	Teaching Learning Activity	Evaluation
				• Specialized cells secrete mucous to keep the membrane moist • Mucous also traps dust particles in the respiratory tract • It lubricates food as it travels through GIT • The connective tissue component of a mucous membrane stabilizes the membrane against the structure it is protecting • It also holds blood vessels that supply blood and nutrient.		
				Serous membrane • Serous membrane or serosa line cavities that don't open directly to the external environment. • It also cover the organs within the cavities • It is made of two layers:- • a layer to line a cavity, called the parietal membrane • other layer which cover the organ called visceral layer • This membrane secrete a lubricant called serous that allows the organs to glide against other structure without causing friction.	T: explain with PPT S: observe and take notes	Q: How many layers contribute to form serous membrane?
				Cutaneous membrane Cutaneous membrane also known as the skin , cover the entire body. It composed of many layers of epithelial cells to protect the body from invading microbes or pathogens. It also protect from light ,heat, and injury The skin is the largest organ of the body that also stores fat vitamin D and water.	T:explain with PPT S: observe and take notes	Q:Define cutaneous membrane

S No	Duration	Specific objective	Content	Teaching Learning Activity	Evaluation
			It houses the sensory receptors for touch and pain It regulates body temperature by secreting sweat to dissipate heat		
			Synovial membrane The junction where two bones meet is called a joint. Surrounding freely movable joints like the shoulder, elbow etc is a synovial membrane It secrete synovial fluid to lubricate the joint space ,making motion much easier Synovial fluid also nourishes the cartilage attached to the end of the bones and contains immune cells called macrophages that rid the joint space of invading microbes	T: explain with PPT S: observe and take notes	Q:what is the function of synovial membrane?
			Meninges Meninges , the covering of brain which are made of dense connective tissue They are 3 in number The outer most is Dura matter---that prevent the brain form moving too much in the skull The second layer is arachnoid layer is a loose connective layer that resemble the web of a spider the inner most layer is the pia matter , is a thin layer that adheres directly on to the brain	T: explain with PPT S: observe and take notes	Q: how many types of meninges?

Summary& evaluation (10Min)

1. Repeat the various body membranes
2. Let the students verbalise the type of membrane
3. Discussed functions of various membranes

Assignment: Define membranes of the body and write in detail about various functions

Evaluation: unit test for 50 marks once the IInd unit is completed

Bibliography:

1

LESSON PLAN

Subject : Anatomy and Physiology

Unit : II

Topic : **Gland - types, structure & functions**

Group : GNM IST year

Place : CLASS ROOM

Date& time :

Teaching method : Lecture cum discussion

A v aids : Black board and chalk, charts

Student pre requisite : The students should be able to know the types, structure & functions of glands.

General objective : At the end of the class the students should be able to gain knowledge regarding the types, Structure & functions of glands.

Specific objective : At the end of the class the students will be able to

1. To classify glands according to the mode of secretion.
2. To classify exocrine glands.
3. To explain structure of exocrine gland.
4. To classify endocrine glands.
5. To explain the functions of endocrine glands.

Review of previous class : Student verbalise the basic knowledge regarding the types, structure & functions of Glands.

Introduction:

S.no	Duration	Specific objective	content	Teaching &learning activity	Evaluation
01.	05 MIN.	To introduce about gland	**Introduction:** In addition to protection and absorption, many cells of the epithelium secrete materials. Such cells, present singly or in groups are called glands. In this topic, we will discuss about types, structure & functions of the glands.	**T:**explain with lecture **S**: listen and take notes	**Q**: Define the Term gland?
02.	05 Min.	To classify glands according to the mode of secretion	**Classification of glands** : 1. **Exocrine gland**: The secretion of exocrine glands is carried through ducts to the target surface, e.g. parotid gland. 2.**Endocrine gland**: the secretions of endocrine glands are directly poured into the circulatory system. These glands are ductless. e.g. pituitary gland 3. **Paracrine gland** : These glands are similar to endocrine glands but their secretions diffuse locally to cellular target in the immediate surroundings.	**T:**explain with lecture **S**: listen and take notes	**Q**: Explain glands according to the mode of secretion?
03	15 min	To classify exocrine glands	**Classification of exocrine glands: exocrine glands can be further classified on the basis of :-** ❖ **1. Number of cells-** (a) **Unicellular :e.g.-** they can be found in the Epithelium lining the intestines. **(b) Multicellular: eg-** lacrimal gland ❖ **2. Branching of ducts-**	**T**:explain with lecture **S:** listen and take notes	**Q**: How you will classify exocrine glands?

S.no	Duration	Specific objective	content	Teaching &learning activity	Evaluation
			(a) **Simple: e.g. -** gastric glands sweat glands. **(b)Compound:eg-** parotid gland, pancreas**.** ❖ **3. Shape of the secretory unit-** **(a) Tubular glands:** Tubular in shape E.g**. -** gastric glands **(b) Acinar glands**: round or oval in shape E.g. **–** salivary glands **(c) Alveolar glands: flask shaped** E.g. – saccular glands ❖ **4. Nature of their secretion –** (a) **Mucous glands:** secretes mucous (contain mucopolysaccharides) (b) **Serous gland :** secretes serous which is proteinaceous in nature. ❖ **5. The manner in which their secretions are poured out of the cells:** **(a)Merocrine –** secretion are thrown out of the cells by the process of exocytosis. E.g goblet cell **(b) Apocrine:** e.g. – Atypical sweat glands & mammary glands (c) **Holocrine**: eg-sebaceous glands		

S.no	Duration	Specific objective	content	Teaching &learning activity	Evaluation
04	05 min	To explain the structural organization of exocrine glands	**The structural organization consisting of three components:-** **(a) Parenchyma-** The secretory cells of a gland constitute its parenchyma. (b) **Stroma-** The connective tissue in which the parenchyma lies is called the stroma. **(c) Duct system-** The ducts convey the secretory product of the gland.	**T**:explain with lecture **S:** listen and take notes	**Q**: explain the structural organization of exocrine glands?
05	10 Min	To classify the endocrine glands.	**<u>Classification of endocrine glands:-</u>** • Pituitary gland: secretes (a) anterior lobe-GH, TSH, ACTH, FSH, LH, Prolactin, (b) Mid lobe- MSH (c) Posterior lobe- ADH, oxytocin, • Thyroid gland: secretes- thyroxin, tri-iodothyronin, calcitonin. • Parathyroid gland:secretes- parathoromone • Adrenal glands:- secretes (a) Cortex- Glucocorticoids,	**T**:explain with lecture **S:** listen and take notes	**Q**: explain about the classification of endocrine gland?

S.no	Duration	Specific objective	content	Teaching &learning activity	Evaluation
			mineralocorticoids, Sex hormones. (b) Medulla – epinephrine, Dopamine nor epinephrine, • Pancreas:-Glucagon, insulin, somatostatin, pancreatic polypeptides • Pineal gland • Ovaries: secretes- Estrogens, progesterone, • Testis: secretes –Androgens, Testosterone • Thymus gland		

S.no	Duration	Specific objective	content	Teaching &learning activity	Evaluation
06	10 Mins	To explain about the function of endocrine glands	**Function of endocrine glands :-** 1. They integrate & co-ordinate various activities of the body along with the CNS. 2. They help in the growth & development of the body. 3. They help in proper digestion & absorption of food by controlling the secretions of digestive exocrine glands. 4. They help in reproductive functions. 5. They help a person to meet stressful situations & emergencies. 6. Regulation of body fluid, volume and its composition.	**T;**Explain with lecture **S;**Listen and take note	Q;Explain function of endocrine gland.

Summary & evaluation: (10 Min.)

1- Classify glands according to the mode of secretion.

2- Classify exocrine glands.

3- Discuss structure of exocrine gland.

4- Classify endocrine glands.

5- Discuss the functions of endocrine glands.

Assignment: Classify glands, exocrine glands, endocrine glands & discuss the structure of exocrine gland.

Evaluation : unit test for fifty marks once the unit 2nd is completed.

Bibliography :

1. Ashalatha PR, deepa g, text book anatomy&physiology for nurses, 4th edn, 2015, jaypee brothers, pg 58-61,500

LESSON PLAN

Subject : Anatomy and Physiology

Unit : II

Topic : **Body cavities and their contents**

Group : GNM IST year

Place : CLASS ROOM

Date& time : ……

Teaching method : Lecture cum discussion

A v aids : Black board and chalk, charts ,poster, PPT

Students Pre Requisite : The students should be able to understand the basic anatomy of our body

General objective : At the end of the class student will be able to gain knowledge about various cavities of human body

Specific objectives : At the end of the class the students will be able to

1. To define cavity
2. To enlist various cavities of our body
3. To describe the boundaries, contents of cranial cavities
4. To describe the boundaries, contents of thoracic cavities
5. To describe the boundaries, contents of thoracic cavities
6. To describe the boundaries, contents of abdominal cavities
7. To describe the boundaries, contents of pelvic cavities

Review of previous class : Ask questions regarding the previous knowledge about anatomy, position and various Plans.

Introduction:-

Ask the students if they know about which organ where are situated in body

Introduce the topic..Also mention the objectives of the lesson to the students here

S No	Duration	Specific objective	Content	Teaching Learning Activity	Evaluation
1	5min	To define cavity	**Introduction** Body cavities are spaces within the body that help, protect, separate and Support internal organs. Bones muscles, ligaments, and other structures Separate the various body cavities from one another.	Lecture cum Discussion	Q:what do you mean by Body cavities?
2	5min	To list out various cavities	**CAVITIES OF BODY** **1. Cranial cavity** **2. Thoracic cavity** **3. Abdominal cavity** **4. Pelvic cavity**	T:write down on black board S:watch and note down	Q:List out various body cavities
3	10min	To describe about boundaries, contents of cranial cavities	**Cranial cavity** The 8 fused cranial bones form a hollow space of the head called cranial Cavity. They are:- Frontal bone anteriorly Occipital bone posteriorly Sphenoid and ethmoid bones inferiorly Parietal bone superiorly Temporal bone laterally The cranial cavity is occupied by the brain	T:explain with Poster S:observe and Take notes	Q:List out the bones which Form the cranial cavity?

S No	Duration	Specific objective	Content	Teaching Learning Activity	Evaluation
4.	10min	To describe about boundaries, contents of thoracic cavities	**<u>Thoracic cavity</u>** **Boundaries** Anteriorly: sternum and ant. Part of ribs and their costal cartilages Posteriorly: Bodies of the 12 thoracic vertebrae & post. Parts of ribs On each side: 12 pairs of ribs & the intercostals muscles Superiorly: By the structures forming the root of the neck Inferiorly: By a muscular sheet known as diaphragm **CONTENTS** The main organs in this cavity are:- Trachea, bronchi(2), Lungs Heart, aorta (sup.& inf. Both) Oesophagus Lymph vessels Nerves	T: explain with PPT S: observe and take notes	Q:explain the various boundaries of thoracic cavity?

S N	Duration	Specific objective	Content	Teaching Learning Activity	Evaluation
5.	10min	To describe about boundaries, contents of abdominal cavities	**Abdominal cavity** It is the largest cavity in the body. For purposes of description, the abdominal cavity is divided into 9 regions By two lateral vertical planes and two horizontal planes. NINE REGIONS OF ABDOMEN:- 1. Epigastric/epigastrium 2. Rt hypochondrium 3. Lt hypochondrium 4. Umbilical 5. Rt lumber 6. Lt lumber 7. Suprapubic /hypogastrium 8. Rt iliac fossa/Rt inguinal region 9. Lt iliac fossa/Lt inguinal region **Boundaries** Superiorly: The diaphragm which separates it from thoracic cavity Inferiorly: It is cont.with pelvic cavity Anteriorly: anterior abdomen wall Posteriorly: Lumber vertebrae & post. Abdomen wall Laterally: Muscles of abdominal wall and lower ribs **CONTENTS** The main organs in this cavity are:-	T:explain with PPT S: observe and take notes	Q: Draw a diagram of abdomen and divided it in 9 regions by imaginary lines?

S No	Duration	Specific objective	Content	Teaching Learning Activity	Evaluation
			Stomach Small intestine Most of the large intestine Liver Gall bladder and bile duct Pancreas Spleen Kidneys-2, upper part of ureters Adrenal glands-2 Numerous blood vessels ,lymph vessels, nerves and lymph nodes		
6.	10min	To describe about boundaries, contents of pelvic cavities	**Pelvic cavity** The pelvic cavity extends from the lower end of the abdominal Cavity. **BOUNDARIES** Superiroly: It is cont. With abdominal cavity Inferiorly: pelvic floor Anteriorly: pubic bones Posteriorly: sacrum and coccyx Laterally: hip bones **CONTENTS** The mains organs and structures in pelvic cavity are:	T: explain with PPT S: observe and take notes	Q:List main organs situated in pelvic cavity?

S No	Duration	Specific objective	Content	Teaching Learning Activity	Evaluation
			Urinary bladder Lower parts of the ureters Urethra Lower part of colon In male- prostate gland, seminal vesicles, spermatic cord, vas deferens, ejaculatory ducts, and urethra In female- uterus, uterine tubes, ovaries, and vagina		

Summary& evaluation (10MIN)

1. Repeat the definition of body cavities.
2. Let the students verbalise the list of various cavities
3. Enlist the various organs come under different kind of cavities

Assignment: Define body cavity and describe the boundaries of abdomen pelvic cavity

Evaluation: Unit test for 50 marks once the unit is completed

Bibliography:

1.Pr ashalatha, g deepa, textbook of anatomy& physiology for nurses,4th edition,2015,jaypee brother, page 20-24

LESSON PLAN

Subject : Anatomy and Physiology

Unit : III

Topic : **Blood composition**

Group : GNM IST year

Place : CLASS ROOM

Date& time : ……

Teaching method : Lecture cum discussion

A v aids : Black board and chalk, charts

Student's pre requisites : Students can identify all types of tissues

General objectives : At the end of the class students will be able to exlain the composition of blood ,different types of cells

Specific objectives : At the end of the class the students will be able to

1. Define blood
2. List the Composition of blood and
3. Explain plasma
4. Explain cellular content of the blood

Introduction:

Ask the students if they know about connective tissue. Ask characteristics of connective tissue .

Brainstorm them ask them to imagine the life without blood .

Also mention the objectives of the lessons .

S.no.	Duration	Specific objective	Contents	Teaching Learningact	Evaluation
1	7 min	Define Blood	Blood is a connective tissue. It provides means of communication between the cells of different parts of the body and the external environment. 1. Carry oxygen from the lungs to the tissues and co2 from the tissues to the lungs. 2. Nutrients from the alimentary tract to the tissues and wastes to the excretory organs 3. Hormones to the target organs 4. Heat produced in the active organs to other tissues 5. Protective substances , antibiotics to the site of infection 6. Clotting factors to the bleeding sites	T: Lecture cum discussion S: Listen and take notes	1.What is blood?
	20mts .	Explain Cellular content of the bloods	**(B) <u>Cellular contents of Blood</u>** 1. Erythrocytes(red blood cells 2. Leucocytes (white cells) Platelets (thrombocytes)	T: Lecture cum Discussion S: Listens and takes notes	Q: Enlist types of blood cell Q: Explain cellular contents of blood

S.no.	Duration	Specific objective	Contents	Teaching Learningact	Evaluation
			1. Erythrocytes(red blood cells) • Biconcave discs shaped. • No nucleus. • 7 micrometer diameter • Main function gas transport • Cells are flexible that can squeeze through capillaries • Contain no intracellular organelles leaving more roomfor haemoglobin • Produced in bone marrow • Life span 120 days • Process of development is called erythropoiesis • Both vitamin b12 and folic acid are required to form RBCs • Total RBCs count 4.5*10^12/litre ton 6.5*10^12/litre		1. What is life span of RBC? 2. What is function of RBCs?

S.no.	Duration	Specific objective	Contents	Teaching Learningact	Evaluation
			2) Leucocytes (white cells) • Important function indefending the body against microbes and other foreign materials • Largest blood cells • 1% of the blood volume • Contain nuclei • Some have granules in their cytoplasm • Two types- 1. Agranulocytes 2. agranulocytes **Granulocytes**– have multilobed nuclei • Their names repsent the dyes they take up when stained in lab • Eosinophils take up the red acid dye, eosin • Basophils take up alkaline methylene blue • Neutrophils are purple because trhey take up both dyes **Agranulocytes-** • Large nucleus but no granules in their cytoplasm • Monocytes type of agranulocytes are actively motile and phagocytic found in circulation . • Monocytes migrates into tissues develop into macrophages • Macrophages have important functions in inflammation and immunity. • Lymphocytes- smaller than monocytes and have large nuclei.		Expain types of WBCs

S.no.	Duration	Specific objective	Contents	Teaching Learningact	Evaluation
			3. Platelets (thrombocytes) Platelets are very small non nucleated discs, 2 to 4 micrometer in diameter • They contain variety of substances that promote blood clotting which causes haemostasis • Normal blood platelet count is between 200*10^9/litre and 350*10^9/litre • Platelets synthesis in red bone marrow is called thrombopoiesis		1 what is the importance of platelets?

Summary and evaluation:(10 minutes)

1. List chemical composition of blood.
2. List types of cells present in blood.
3. Functions of the different cells present in blood.
4. Number of cells of different types present in normal adult human

Assignment :

1. Write the different types of proteins present in blood composition.
2. What are the different types of white blood cells present in blood ?

Evaluation:

Bibliography :

1. Waugh A., Grant A.: Anatomy and Physiology in Health and Illness, 10th edn.,Chuchill Livingstone Elsevier, Edinburgh, 58-67,2006

LESSON PLAN

Subject : Anatomy and Physiology

Unit : III

Topic : **Blood formation**

Group : GNM IST year

Place : CLASS ROOM

Date& time : ……

Teaching method : Lecture cum discussion

A v aids : Black board and chalk, charts , Projector

Student's Pre Requisites : Students can identify all types of blood cells, with chemical composition

General Objectives : At the end of the class students will be able to exlain the erythropoiesis, leucopoiesis, thrombopoiesis, formation of haemoglobin

Specific Objectives : At the end of the class the students will be able to

1. Explain origin of blood cells
2. Explain steps of hematopoiesis
3. Describe sites of hematopoiesis
4. Explain process of Erythrocytes (RBC)formation
5. Explain process of platelets(thrombocytes) formation
6. Describe synthesis of haemoglobin

Introduction:

Brainstorm the students to ask them that after any blood loss a person regain their normal blood volume, how?

Ask them whether all types of blood cells have different process of synthesis.

Whether blood donation can cause permanent blood loss?

We know every tissue of our body has capability of regeneration, is our blood cells too have the capability to regenerate them after their life span?

S.no.	Duration	Specific objectives	Content	Teaching-learning activities	Evaluation
1.	5 min.	Explain origin of blood cells	Blood cells are synthesised mainly in red bone marrow. Some lymphocytes are additionally produced in lymphoid tissue. The process of blood cell formation is called hemopoiesis or hematopoiesis. ➢ process of erythrocyte formation is called as erythropoiesis. ➢ Process of lymphocytes formation is called as lymphopoiesis.	Lecture cum discussion	What is hematopoiesis?
3.	5 min.	Describe sites of hematopoiesis	Formation of blood cells is taken place in red bone marrow. As we know , in spongy bone tissue, red bone marrow is found . Specially in flat bones and the ends of long bones. **Diffrent dites of hematopoiesis during various phases of life** **s.no. phase period site** **1. yolk sac first 3month of gestation yolk site**	T:Lecture cum discussion with projector S:listen and takes notes	Where do the blood cells are formed?

S.no.	Duration	Specific objectives	Content	Teaching-learning activities	Evaluation
			2 hepatic phase — 3-5 months of gestation — liver (chief site till birth); spleen (minor site) **3. myeloid phase — Till adult life — red bone marrow**		
4.	10 min.	Explain process of Erythrocytes (RBC)formation	Formation of new RBCs in red bone marrow is called erythropoiesis. ❖ Orderly development of mature RBCs from stem cells. ❖ The proerythroblast is the earliest appearing differentiated cell of erythroid series. ❖ As the cell matures, cell reduces in size, due to decrease in cytoplasm and nuclear size. ❖ Haemoglobin appear in the intermediate normoblast. ❖ Condensation and degeneration of nucleus ❖ Mature RBCs have eosinophilic cytoplasm since they do not have DNA, RNA, or	Lecture cum discussion Power point presentation	Enlist the steps of erythropoiesis

S.no.	Duration	Specific objectives	Content	Teaching-learning activities	Evaluation
			other cell organelles. ❖ The mature RBCs are released into circulation ❖ **NORMAL VALUES** **1. Males 4.5-5.5 million/mm^3** **2. Females 4-5 million/mm^3**		
5.	10 min.	Explain process of Leukocytes (WBC)formation	❖ Formation of WBCs in bone marrow and lymphoid tissue is called leukopoiesis. ❖ In the intrauterine life , the WBCs develop in the mesoderm and migrate into the blood vessels. ❖ In the postnatal life , the granulocytes and monocytes develop from the red bone marrow, while the lymphocytes develop from the lymphoid tissues mainly and to a lesser extent, from the red bone marrow. Cells involved in maturation of WBCs ❖ Myeloblast ❖ Promyelocyte ❖ Myelocyte ❖ Metamyelocytes ❖ Band cells ❖ Segmented neutrophill	Lecture cum discussion Power point presentation	Explain process of Leukocytes (WBC)formation

S.no.	Duration	Specific objectives	Content	Teaching-learning activities	Evaluation
			TOTAL WBC COUNT Adult 4000-11000/mm^3 it is more at birth		
6.	5 min.	Explain process of platelets (thrombocytes) formation	Platelets develop from pluripotent stem cell in red bone marrow is called thrombocytopoiesis. The cells named in maturation of platelets— ❖ Pluripotent stem cell ❖ Committed stem cell ❖ Megakaryoblast ❖ Promegakaryoblast ❖ Megakaryocyte ❖ Platelet	Lecture cum discussion Power point presentation	Explain process of platelets (thrombocytes) Formation

S.no.	Duration	Specific objectives	Content	Teaching-learning activities	Evaluation
7.	5 min.	Describe synthesis of haemoglobin	Hemoglobin or the red pigment is the most important constituent of RBCs. It gives the blood its characteristic red color. The heme portion of haemoglobin is synthesised in mitochondria and the protein part globin is synthesized in ribosomes. Actually heme is tetra porphyrin chelate as per chemistry. In which centre iron atom is found. **NORMAL LEVELS** **Average Hb content in blood is 14-16 g/dL.** **1. males: 14-18g/100ml** **2. females: 12-16g/100ml** **3.infants: 18-23g/100ml**	Lecture cum discussion with chart	What is haemoglobin and how is this synthesized?

Summary and Evaluation :(10 minutes)

In this lesson plan , today we discussed-

1) Hematopoiesis
2) Site of blood formation.
3) Formation of different blood cells

Assignment :

1) what is hematopoiesis ?
2) Discuss the steps in erythropoiesis ?

Evaluation:

Bibliography :

1.Ashalatha PR., deepa g. , textbook of anatomy and physiology for nurses, jaypee publication, 4thedn., 2015, 74-98

LESSON PLAN

Subject : Anatomy and Physiology

Unit : III

Topic : **Function of blood**

Group : GNM IST year

Place : CLASS ROOM

Date& time : ……

Teaching method : Lecture cum discussion

A v aids : Black board and chalk, charts

Students prerequisite : The students should be able to know about blood and blood composition and importance of blood in our body

General objective : At the end of the class the students should be able to gain knowledge regarding the function of blood.

Specific objective : At the end of the class the students will be able to:

1. To know about the blood
2. To enlist all the function of the blood
3. To explain each function of the blood.

Review of previous class : Students verbalize the formation &composition of the blood.

Introduction : Ask the students about blood and blood group of students (ask any 5 students),if they know.

Introduce the topic

Also mention the objectives of the lesson to the students here

S. No	Duration	Specific Objective	Content	Teaching Learning Activities	Evaluation
1	5 Min.	To know about the blood	➢ **Introduction of blood**: Blood is a fluid connective tissue which is red in colored, opaque and alkaline in reaction. Body contains about 5 litres of blood in an adult which comes to about 8% of body weight	T:Lecture cum discussion S:Discuss and take notes	What is Blood?
2	15 Min.	To enlist all the functions of blood	➢ **Functions of blood** : 1.Transport of Respiratory gases 2.Excretory functions 3.Nutritional functions 4.Acid-Base Balance 5.Transport of Hormones 6.Protection or Defenses 7.Temperature Regulation 8.Water balance 9.Osmotic Pressure	T:Lecture cum discussion S:Discuss and take notes	Enlist various functions of blood?
3.	30 Min.	To explain each function of the blood	➢ **1. Transport of respiratory gases**: Hemoglobin in the RBCs carries oxygen from the lungs to the tissue for the oxidation of food and production of energy. From the tissues, carbon dioxide is carried to the lungs, where it is exhaled. ➢ **2. Excretory function**: Various waste products of the tissue metabolism are carried by blood to the excretory channels-kidneys, skin and lungs. ➢ **3. Nutritional Function**: The end products of digestion	T:Lecture cum discussion S:Discuss and take notes	Q. explain function of the blood(ask 1function to 5 students)

S. No	Duration	Specific Objective	Content	Teaching Learning Activities	Evaluation
			(glucose, amino acids, lipids, etc.)Are absorbed from the digestive tract and transported by blood to various tissues for growth and supplying energy. ➢ **4. Acid-Base balance**: Normal pH of blood is 7.4 the enzymes of our body can act only within a narrow range of this pH. Large amounts of acids are produced daily as a result of metabolism. ➢ **5. Transport of hormones**: Hormones are secretions of endocrine and ductless glands, which are directly poured into the blood. Blood carries them to their target organs. ➢ **6. Protection or defense**: The WBCs especially the neutrophils and monocytes can attack the disease causing organisms like bacteria, virus, fungus, etc. Blood also contains antibodies or immunoglobulin, which can act against the foreign antigens. ➢ **7. Temperature Regulation**: normal body temperature is 98.4 F or 37 C. Blood helps in easy dissipation of heat from warmer to cooler parts of body, thus helping to keep the temperature of the body at a constant. ➢ **8. Water balance**: Blood maintains and regulates the fluid contents in various body compartments. ➢ **9. Osmotic pressure**: Blood contains plasma proteins, which exert the osmotic pressure. This is responsible for the balance of fluid in the vascular system.		

Summary &evaluation: **(10 Min.)**

- List various functions of the blood.
- Discuss each function of the blood.

Assignment : Enlist and describe the various functions of the blood.

Evaluation : Unit test for 50 marks once the unit iiird is completed.

Bibliography :1.Ashalathapr, deepa g, text book anatomy &physiology for nurses, 4thedn, 2015, jaypee brothers, pg74

LESSON PLAN

Subject : Anatomy and Physiology

Unit : III

Topic : **Blood grouping & blood clotting**

Group : GNM IST year

Place : CLASS ROOM

Date& time : ……

Teaching method : Lecture cum discussion

A v aids : Black board and chalk, charts

Students Pre Requisite : The students should be able to identify the situations demanding the knowledge regarding blood grouping.

General objective : At the end of the class student will be able to gain knowledge regarding blood grouping and blood clotting

Specific objectives : At the end of the class the students will be able to

1. To define blood group
2. To explain ABO system
3. To elicit genotype of blood group
4. To know about Rh system
5. To Significance of Rh incompatibility
6. To explain Uses of blood group
7. To define blood clotting
8. To List out the events
9. Clotting factors
10. To explain Mechanism of coagulation

Review of previous class : Ask question regarding blood composition and blood formation.

Introduction:

Ask the students they know anyone who is ever encountered with blood transfusion like situation.

Ask how did they get information about their blood group?

Also mention the objectives of the lesson to the students here

S No	Time	Specific objective	Content	Teaching learning activities	Evaluation
1	6min	To define blood group	**Blood group**:-the surface of red blood cells carries a range of different proteins (called antigens) that can stimulate an immune response if transferred from one individual (the donor) into the blood stream of an incompatible individual. These antigens, which are inherited, determine the individual's **blood group**. There are many different collections of red blood cell surface antigens, but the most important are the ABO and Rhesus systems.	T:Lecture cum discussion S: discuss and take notes	Q: What do you mean by blood group?
2	5min	To explain the ABO system	**The ABO system** ABO and Rh system is discovered by Landsteiner in 1901. About 55% of the population has either A-type antigens (blood group A), B-type antigens (blood group B) or both (blood group AB) on their red cell surface. The remaining 45% have neither A and B type antigens (blood group O). The corresponding antibodies are called anti-A and anti-B. **Universal recipients-**blood group AB people make neither anti-A nor anti-B antibodies, they are known as universal recipient. **Universal donor**- blood group O people have neither A and B antigens on their red blood cell membranes,	T:Lecture using charts S:listen and take notes	Q: what is ABO system and who are the universal donor and universal recipient?

S No	Time	Specific objective	Content	Teaching learning activities	Evaluation
			and their blood may be safely transfused into A,B, AB or O types; group O is known as universal donor.		
3.	2min	To elicit genotype of blood group	**Genotype of blood group-** BLOOD GROUP — GENOTYPE A — AA/AO B — BB/BO AB — AB O — OO	T:Lecture cum discussion S:Discuss and take notes	Q. what is genotype of blood group?
4.	5min	To know about Rh system	Discovered in rhesus monkeys. There are several subgroup of Rh antigens viz C, D, E, c, d, etc. But there are no naturally occurring antibodies. D is the most important antigen. **Rh positive:-**when Rh D is present in RBC (present in90%people)**.** **Rh negative:-**when Rh D is absent in RBC(count 10%population). Rh antibodies are absent in both Rh +ve and Rh -ve persons.	T:Lecture cum discussion S:discuss and take notes	Q. what do you mean by Rh system?

S No	Time	Specific objective	Content	Teaching learning activities	Evaluation
5	2min	To Significance of Rh incompatibility	**Rh incompatibility**- Hemolytic disease. Erythroblastsis fetalis etc	T:Lecture cum discussion S:discuss and take notes	Q: what do you mean by Rh incompatibility?
6	5min	To explain Uses of blood group	➢ BT ➢ To diagnose or to predict Rh incompatibility ➢ To investigate a case of disputed paternity ➢ MLC value ➢ Organ transplantation ➢ Susceptibility to certain disease	T:Lecture cum discussion S:discuss and take notes	
7	5min	To define blood clotting	**Blood clotting:-**It means arrest of bleeding orhomeostasis by physiological process. When there is a small injury to a blood vessel a number of event are initiated that finally arrest the bleeding by formation a clot.	T: Lecture cum discussion S:discuss and take notes	Q:Define blood clotting

S No	Time	Specific objective	Content	Teaching learning activities	Evaluation
8	10 min	To List out the events	These events are:- ➢ Immediate vasoconstriction ➢ Formation of a platelet plug or temporary homeostasis plug/primary homeostasis. • Platelet adhesion • Platelet aggregation • Loose platelet plug • Primary homeostasis **Bleeding time:-**Time between onset of bleeding and primary homeostasis.(8 min) ➢ Secondary homeostasis:- Loose platelet plug fibrin **Clotting time:-**Time between onset of bleeding andthe formation of affirm clot(10 min)	T:Lecture by drawing diagram S:discuss and take notes	Q:List out various physiological events?

S No	Time	Specific objective	Content	Teaching learning activities	Evaluation
9	5min	Clotting factors	**Clotting factors:-** They are 13 in number 1. Fibrinogen 2. Prothrombin 3. Tissue factor(thromboplastin) 4. Calcium 5. Proaccelerin or labile factor 6. The existence of this factor is not accepted 7. Proconvertin or stable factor 8. Anti hemophilic factor A 9. Christmas 10. Stuart-prower factor 11. Plasma thromboplastin antecedent(PTA) 12. Hageman/glass factor 13. Fibrin stabilizing **Vitamin K is essential for synthesis of factors II,VII, IX and X.**	T:Lecture cum discussion S:discuss and take notes	Q:List out all the clotting factors
10	5min	To explain Mechanism of coagulation	Reaction of coagulation is the conversion of the soluble plasma protein fibrinogen to insoluble fibrin threads. o For this, the following reaction have to occur: o Thrombin acts upon fibrinogen to form fibrin o Thrombin is formed by activation of prothrombin	T:Lecture cum discussion S:discuss and take notes	Q. explain the mechanism of coagulation

S No	Time	Specific objective	Content	Teaching learning activities	Evaluation
			○ Prothrombin to thrombin activation occurs in the presence of factor Xa ○ Factor Xa produced by two major pathways: ○ The intrinsic pathway The extrinsic pathway Vitamin k is required for the synthesis of pro coagulant factors 2,7,9 and 10 Liver synthesized the pro coagulant factors -5,7,9,10 and 11		Q: what is the role of vit k?

Summary&evaluation(10MIN)

1. What is blood grouping system?
2. What is the importance of ABO& Rh system in medical field?
3. What is blood clotting?
4. List out various clotting factor?

Assignment:

1. Explain the ABO & Rh system ?
2. List out the various clotting factor?

Evaluation: Unit test for 50 marks once the IIIrd unit is completed

Bibliography:

1. PR Ashalatha& G Deepa, Anatomy& Physiology For Nurses,4th edition,2015,Jaypee brother, page 94-97
2. Waugh anne,grant Allison; Ross and Wilson anatomy and physiology in health and illness,12th edition,2014 page no.67

LESSON PLAN

Subject : Anatomy and Physiology

Unit : III

Topic : **Blood cross matching**

Group : GNM IST year

Place : CLASS ROOM

Date& time : ……

Teaching method : Lecture cum discussion

A v aids : Black board and chalk, charts

Students Pre Requisite : The students should be able to assess the need of cross matching

General objective : At the end of the class student will be able to gain knowledge regarding blood cross matching

Specific objectives : At the end of the class the students will be able to

1. To explain blood cross matching
2. To explain about types of cross matching
3. To demonstrate the procedure of blood grouping and cross matching
4. To explain the finding from above procedure
5. To explain about risk

Review of previous class - Ask question regarding blood and blood groups.

Introduction - Ask the students if they know about need of cross matching.

S NO	Duration	Specific Objective	Content	Teaching learning activities	evaluation
1	5 min	To explain blood cross matching	Introduction:-Blood cross matching, in transfusion medicine; refer to the test that is performed prior to blood transfusion/organ transplantation in order to determine if the donor's blood is compatible with the blood of an intended recipient. Compatibility is determined through matching of different blood group system specially the ABO and Rh system.	T:Lecture cum discussion S:Discuss and take notes	Q: what is blood cross matching?
2	10 min	To explain about types of cross matching	**Immediate-spin Cross matching:-** It is an abbreviated form of cross-matching that is faster, less expensive but also less sensitive. It is an immediate test that takes several minutes to do and it can be done at room temperature. **Electronic cross-matching** It is a computer-assisted analysis using data, from the donor unit (where a donor's blood is tested prior to donation) and testing done on blood samples from the intended Cross match fall into two category:- Major cross match:-recipient serum is tested against donor packed cell to determine if the	T:explain with demonstration S: listen, watch and take notes	Q: How many type of blood cross-matching?

S NO	Duration	Specific Objective	Content	Teaching learning activities	evaluation
			recipient has performed antibodies against any antigen on the donor cell. Minor cross match:-Recipient red cells are tested against donor serum to detect donor antibodies directed against a patient antigen.		
3	15 min	To demonstrate the procedure of blood grouping and cross matching	First of all take the blood sample from appropriate site with aseptic technique. The sample of blood is mixed with commercially-prepared antibodies against type A and B blood. If the blood cells **agglutinate** (stick together) it means that the blood has had a reaction with one of the antibodies. Another step, called **back typing**, is performed next. The blood serum is stirred together with type A and type B blood. Blood typing also determines whether a patient has proteins called **Rh factor** on their RBCs.	T:Demonstrate the procedure with lab kit S: observe	Q. what do you learn from procedure?

S NO	Duration	Specific Objective	Content	Teaching learning activities	evaluation
			People with Rh factor are designated Rh positive (Rh+), while people without Rh factor are called Rh negative (Rh-). Your Rh type is also used to decide which type of blood you can safely receive during a transfusion.		
4	15min	To explain the finding from above procedure	**Finding are :-** People with type A blood will have anti-B antibodies. People with type B blood will have anti-A antibodies. People with type O blood will have both. Therefore: If your blood clumps only when the B cells are added, you have blood type A 2. If your blood clumps only when the A cells are added, you have blood type B 3. If your blood clumps in both cases, you have type O 4. If your blood does not clump when both types of blood are added, you have blood type	T:demonstrate the procedure with Lab kit S:observe and practice and take notes	Q: what is your blood group?

S NO	Duration	Specific Objective	Content	Teaching learning activities	evaluation
			AB Rh typing: If your blood sticks together when anti-Rh serum is added, you are Rh+ If your blood does not clump when anti-Rh serum is added, you are Rh-		
5	5min	To explain about risk	**Risk regarding blood typing and cross matching:-** Bruising, Bleeding, Infection at site etc	Lecture cum discussion S:Discuss and take notes	Q: what are the risks regarding blood grouping and cross matching?

Summary & Evaluation (10min)

- Define cross matching.
- List out the type of method
- Significance of performing procedure during emergency
- Verbalise the procedure(ask to 5 student)

Assignment:

1. What are blood grouping and cross matching?
2. Explain the procedure of cross matching?

Evaluation:

Bibliography:

1.http://Wikipedia/blood grouping and cross matching

LESSON PLAN

Subject : Anatomy and Physiology

Unit : III

Topic : **Blood products and their uses**

Group : GNM IST year

Place : CLASS ROOM

Date& time : ……

Teaching method : Lecture cum discussion

A v aids : Black board and chalk, charts

Student pre-requisites : The students should be able to know the various products of the blood and their uses.

General objective : At the end of the class the students should be able to gain knowledge regarding the products of blood and their uses.

Specific objective: at the end of the class the students will be able to:

1. To know about the blood
2. List down the products the of blood
3. To know about cellular components of blood and their uses
4. To know about the plasma components of blood and their uses
5. To know about the plasma derivatives and their uses

Review of previous class - student verbalize the composition & various product of the blood & their uses.

Introduction **-**Ask the students if they know about any one blood products and their uses

And what they know about blood

Also mention the objectives of the lesson to the students here

S. No	Duration	Specific Objective	Content	Teaching Learning Activities	Evaluation
1	5 Min.	To know about the blood	➢ **Introduction of blood**: Blood is a fluid connective tissue which is red coloured, opaque and alkaline in reaction. Body contains about 5 litre of blood in an adult which comes to about 8% of body weight	T:Lecture cum discussion S:discuss and take notes	What is Blood?
2	10 Min.	List down the products the of blood	**Products of the blood** 1.CELLULAR COMPONENTS : a) Red cell concentrates b) Platelet concentrates c) Granulocyte concentrates 2.PLASMA COMPONENTS a) Fresh frozen plasma b) cryoprecipitate c) Cryopoor plasma d) Stored plasma 3.PLASMA DERIVATIVES : a) Albumin b) Immunoglobulin c) Coagulation factors	T:Lecture cum discussion S:discuss and take notes	Enlist various products of the blood?

S. No	Duration	Specific Objective	Content	Teaching Learning Activities	Evaluation
3	15Min.	To know about cellular components of blood and their uses	**1.<u>cellular components</u>** A) RED CELL CONCENTRATES : also called packed Red Cells. CONTAINS : only RBCs , Platelets and plasma are removed, Stored at 2-4degree centigrade INDICATION / USES : 1. Anaemia 2. Thalassemia 3. Sickle cell anaemia TYPES OF RBC CONCENTRATES : a) Leucoreduced RBC b) Washed RBC a) LEUCOREDUCED RBCS : most plasma & 70-80% WBC removed & 100 ml of AS added. INDICATION / USES : 1. Symptomatic anaemia 2. Suitable for patients requiring repeated transfusion. 3. Prevent febrile non hemolytic reactions. b) WASHED RBCs : INDICATION/USES : 1. Multi transfused patients with	T:Lecture cum discussion S:discuss and take notes	Q. Enlist the cellular components of blood and their uses ?

S. No	Duration	Specific Objective	Content	Teaching Learning Activities	Evaluation
			recurrent febrile reactions. 2. Urticarial reactions 3. Anaphylactic reactions 4. Ig A deficiencies with Ig a antibodies B) PLATELAT CONCENTRATES : contains only platelets, stored at 20-24 c INDICATION / USES : 1. Prophylactic 2. Therapeutic c) GRANULOCYTES CONCENTRATES : contains only granulocytes, prepared by apheresis. INDICATION / USES : 1. Severe neutropenia with infection		
4.	10 Min.	To know about the plasma components of blood	**2. <u>Plasma components</u>** : a) Fresh frozen plasma: contains all coagulation factors , plasma proteins INDICATION/ USES : 1. Single clotting factor deficiency 2. Multiple clotting factors deficiency 3.massive transfusions	T:Lecture cum discussion	Q. Enlist the plasma components of blood and

S. No	Duration	Specific Objective	Content	Teaching Learning Activities	Evaluation
		and their uses	4. Warfarine overdose 5. TTP b) Cryoprecipitate : 1 unit contains Factor eight. Factor thirteen, fibrinogen, stored at -30 c. INDICATION /USES : 1. Hemophilia A 2. Von willebrands disease 3. fibrinogen deficiency c) Cryopoor plasma : contains stable clotting factors, no factor 8 & fibrinogen. INDICATION / USES : Replacement in plasma exchange for TPP d) Stored plasma : contains anticoagulants factors, stable clotting factors. INDICATION /USES : plasma protein deficiency	S:discuss and take notes	their uses?
5.	10 Min.	To know about the plasma	**3) plasma derivatives :** 1. Coagulation factors a) FACTOR 8 : indication/ uses : 1. Hemophilia A	T:Lecture cum	Enlist the plasma

S. No	Duration	Specific Objective	Content	Teaching Learning Activities	Evaluation
		derivatives and their uses	2. loading dose & maintenance dose b) FACTOR 9 : Indication /uses : 1. Hemophilia B 2) ALBUMIN : Indication/uses : 1. Nephritic syndrome 2. liver disease with fluid overload 3) IMMUNOGLOBULINS : a) normal immune globulins : Prepared from normal plasma indication /uses : 1.Infections 2.immune thrombocytopenic purpura 3. Hypo gamma globulinaemia b) Specific immune globulins : obtained from donors with high titers of antibodies , Examples - anti D , anti hepatitis b & anti vericella zoster	discussion S:discuss and take notes	derivatives and their uses?

Summary &evaluation: (10 Min.)

1. List various products of the blood.
2. Discuss cellular components of blood and their uses.
3. Discuss plasma components of blood and their uses.
4. Discuss plasma derivatives of blood and their uses.

Assignment: Enlist and describe the various products of the blood and their uses.

Evaluation : Unit test for 50 marks once the unit IIIrd is completed.

LESSON PLAN

Subject : BIO-SCIENCE (Anatomy & physiology)

Unit : IV Circulatory system

Topic : **Heart: Structure**

Group : G.N.M. 1st Year

Place : Class Room & Demonstration Room

Date & time : 60 minute

Teaching method : Lecture cum demonstration

A V aids/instruction aids : Chalk & Board, chart, LCD, Computer

General Objective: At the end of teaching the student will be able to gain knowledge regarding structure of heart.

Specific Objective: At the end of the teaching the student will be able to gain knowledge and apply in to their clinical practices

1. To explain about position of heart
2. To describe Pericardium
3. To explain about Myocardium
4. To describe about Endocardiam
5. To discuss about interior of heart

S. No.	Time	Specific objective	Content	Teaching learning activities	Evaluation
1.	5min.	To explain about position of heart	**Introduction:** Heart is a roughly cone shaped holder muscular organ. It is about 10 cm long & it's about size of the owner's fist. It weight 225gm in women & 310 gm in male **Position:** The heart lies in thoracic cavity in the mediustirium between lungs: : Present bone absence : Apex below **Structure :** **The heart wall** is composed of three layers of tissue - : Pericardium : Myocardium : Endocardium	T: Explain with power point presentation. S: Listen and takes notes	Q: explain about the position of heart?

S. No.	Time	Specific objective	Content	Teaching learning activities	Evaluation
2.	10 min.	To describe pericardium	**Pericardium:** made up of two sacs 1. **The outer sac (the fibrous pericardium):** consists of fibrous tissue. The fibrous pericardium is continuous with the tunica adventitia of the great blood vessels above and is adherent to the diaphragm below. The outer layer of the serous pericardium, the parietal pericardium, lines the fibrous pericardium. **The inner sac (the serous pericardium):** of a continuous double layer of serous membrane. The inner layer, the visceral pericardium, which is continuous with the parietal pericardium, is adherent to the heart muscle. The serous	T: Explain with power point presentation. S: Listen and takes notes	Q: describe about the pericardium?

S. No.	Time	Specific objective	Content	Teaching learning activities	Evaluation
			membrane consists of flattened epithelial cells. It secretes serous fluid, called pericardial fluid, in to the space between the visceral and parietal layers, which allows smooth movement between them when the heart beats.		
3.	10 min.	To explain about myocardium	**Myocardium:** The myocardium is composed of specialised cardiac muscle found only in the heart. It is striated, like skeletal muscle, but is not under voluntary control. Each fibre (cell) has a nucleolus and one or more branches. Each one does not need to have a separate nerve supply. The myocardium is thickest at the apex and thins out towards the base. This reflects the amount of work each chamber contributes to the pumping	**T:** Explain with power point presentation. **S**: Listen and takes notes	**Q**: explain about the Myocardium?

S. No.	Time	Specific objective	Content	Teaching learning activities	Evaluation
			of blood. It is thickest in the left ventricle, which has the greatest workload.		
4.	10 min.	To describe Endocardium	**Fibrous tissue in the heart:** The myocardium is supported by a network of fine fibres that run through all the heart muscle.	T: Explain with power point presentation. S: Listen and takes notes	Q: describe about the Endocardium?
5.	15 min.	To explain interior of heart	**Endocardium:** • This lines the chambers and valves of the heart. • It is a thin, smooth membrane to ensure smooth flow of blood through the heart. • It consisted of flattened epithelial cells, and it is continuous with the endothelium lining the blood vessels.	T: Explain with power point presentation. S: Listen and takes notes	Q: explain about Interior of heart?

S. No.	Time	Specific objective	Content	Teaching learning activities	Evaluation
			Interior of heart: • The heart is divided into a right and left side by the septum, a partition consisting of myocardium covered by endocardium. • Each side is divided by an atrioventricular valve into the upper atrium and the ventricle below.The atrioventricular valves are formed by double folds of endocardial strengthened by a little fibrous tissue. • The right atrioventricular valve (tricuspid valve) has three flaps or cusps and the left atrioventricular valve (mitral valve) has two cusps. • Flow of blood in the heart is one way; blood enters the heart via the atria and passes into the ventricles below.		

Summary(5min) :-

Heart consists of_ four chambers. Right atrium and ventricle receive unoxygenated blood from IVC and SVC. And pump to lungs through pulmonary aorta and arteries.

Left side of heart (lt atrium and ventricle receive oxygenated blood from lungs through four pulmonary veins. And pump to the systemic circulation through aorta and arteries.

Assignment:- List various function of heart.

Evaluation:- Class Test after Completion of unit IV .

Bibliography:-

1- Churchill livingston Elsevier, pp 83-84.
2- Choudhary sujit k," concise medical physiology" 4th edition 2002, new central book agency(P) ltd, pp-159-160Wagh anne and Grant Allison, " ross and Wilson anatomy and physiology in health and illness" 7th edition 2014,

LESSON PLAN

SUBJECT : Anatomy & Physiology

UNIT : IV (Circulatory system)

TOPIC : **Heart Functions (topic no 247)**

GROUP : G.N.M. I YEAR

PLACE : Class Room & Demonstration Room

DATE & TIME : 30 Minute

TEACHING METHOD: Lecture Cum Discussion

A V AIDS : Blackboard&Chalk, Chart, PPT.

Students' pre-requisite : Students should have knowledge about structure of heart.

GENERAL OBJECTIVE: At the end of class student will be able to gain knowledge about functions of heart .

SPECIFIC OBJECTIVES: At the end of class student will be able:- To explain function of right side of heart.And discuss function of left side of heart, know about supportive function of heart.

S.No.	Time	Specific Objective	Content	Teaching Learning activity	Evaluation
1	**10 mins**	To explain function of right side of hear.t	**RIGHT SIDE OF HEART:** ✓ Receive deoxygenated blood from body tissues. ✓ Passing deoxygenated blood through tricuspid valve to right ventricle. ✓ Pumping of blood from right ventricle to lungs in pulmonary circulation.	T: Explain with power point presentation. S: Listen and takes notes	Q: List function of right side of heart
2	**10 mins**	To discuss about function of left side of heart.	**LEFT SIDE OF HEART:** ✓ Receive oxygenated blood from lungs. ✓ Pumping blood from left atrium to left ventricle through bicuspid valve. ✓ Pumping blood from left ventricle to aorta in systemic circulation.	T: Explain with power point presentation. S: Listen and takes notes	Q: List function of left side of heart
3	**5 mins**	To know about supportive function of heart.	**Supportive function of heart:** ✓ Supply nutrition along with blood to body tissues. ✓ Transportation of various hormones to target organs.	T: Explain with power point presentation. S: Listen and takes notes	**Q: ask about** supportive function of heart

Summary(5min) :-

Heart consists of_ four chambers. Right atrium and ventricle receive unoxygenated blood from IVC and SVC. And pump to lungs through pulmonary aorta and arteries.

Left side of heart (lt atrium and ventricle receive oxygenated blood from lungs through four pulmonary veins. And pump to the systemic circulation through aorta and arteries.

Assignment:- List various function of heart.

Evaluation:- Class Test after Completion of unit IV .

Bibliography:-

1- Wagh anne and Grant Allison, " ross and Wilson anatomy and physiology in health and illness" 7th edition 2014, Churchill livingston Elsevier, pp 83-84.
2- Choudhary sujit k," concise medical physiology" 4th edition 2002, new central book agency(P) ltd, pp-159-160 .

LESSON PLAN

SUBJECT : Anatomy & Physiology.

UNIT : IV (**Circulatory system**)

TOPIC : **Conductive system of heart and cardiac cycle**

GROUP : GNM 1ST YEAR

PLACE : Class room and demonstration room.

DATE & TIME : 60 minute.

TEACHING METHOD : Lecture cum discussion.

AV AIDS : Blackboard&Chalk, Chart, PPT.

Students pre-requisite- **:** Students should have through knowledge about structure of heart, its interior structure, and circulation through heart.

GENERAL OBJECTIVE : At the end of class the student will be able to gain knowledge about conductive system of heart and cardiac cycle.

SPECIFIC OBJECTIVE : - After end of the class student will be able :

- To introduce about conductive system of heart.
- To explan about sino atrial node
- To describe atrioventricular node.
- To discuss about atrioventricular bundle.
- To describe cardiac cycle.

S. No.	Time	Specific objective	Content	Teaching Learning activity	Evaluation
1.	**5 min**	To introduce about conductive system of heart.	**<u>INTRODUCTION</u>** : - • The heart posses the property of autorrhythmicity, which means it generate its own electrical impulses and beats independently of nervous and hormonal control, i.e. it is not dependent on external mechanism to initiate its each beat. However it is supplied by both sympathetic and para sympathetic nervous supply which increase and decrease intrinsic heart rate. Inaddition hormones like adrenaline and thyroxine affetct the heart rate. • The heart has intrinsic system composed of specialised neuromuscular cells in the myocardium initiate and conduct impulses, casing coordinated and synchronised contration of heart muscle. • Sino atrial node, atrio-ventricular node, bundle of his and purkinje fibres together form a system whose function is to create and convey the impulsesto every part of the heart. It is called conductive system of heart.	**T**: Explain with power point presentation. **S**: Listen and takes notes	Q: what do you mean auto rhythmicity.

S. No.	Time	Specific objective	Content	Teaching Learning activity	Evaluation
2.	**5 min**	To explain about sino atrial of node	**SINOATRIAL NODE** : - ❖ Small mass of special call lies in the wall of right atrium near the opening of superior vana cava.it is abbreviated as SAnode. ❖ S A node is "PACE MACKER " of heart. ❖ SA node generate these regular impulses because they are electrically unstable. This iunstability leads to discharge or depolarisation of regularly about 60-80 times in a minute. The depolarisation is immediately followed by repolarisation. ❖ Firing of S A node cause atrial contraction.	**T**: Explain with power point presentation. **S**: Listen and takes notes	Q: ask about sino atrial of node .
3.	**5 min**	To describe atrioventricular node	**ATRIOVENTICULAR NODE** :- ❖ Small mass of neuromuscular tissue is situated in the wall of atrial septum in the interatrial wall near the atrioventricular valves. . ❖ A V node conducts impulses that arrive via the atria & originated from S. A. node. ❖ There is a delay of 0.1 of a second to pass the impulse from atrium to ventricle. This allow atrium to finish contraction before starting ventricular contraction ❖ A V node has a secondary pace maker function.	**T**: Explain with power point presentation. **S**: Listen and takes notes	**Q:** ask about atrioventricular node

S. No.	Time	Specific objective	Content	Teaching Learning activity	Evaluation
			❖ Its intrinsic firing rate slower than that set by S A node. Rate of impulse generation is slower than SA node (40-60 beats / minute).		
4.	**5 min**	To discus about atrioventicular bundle or bundle of His.	**<u>ATRIOVENTICULAR BUNDLE R BUNDLE OF HIS</u>** :- ❖ This is mass of specialised fibres that originate from the A V node. AV bundle crosses the fibrous ring that separates the atria and ventricle. And reachin ventricle where it splits in two branches called right and left bundle branch. ❖ It divides in right and left bundle branches. ❖ Within ventricular myocardium the branches breaks up in to fine fibres, called purkinje fibres. ❖ A V bundle, bundle branches and purkinje fibres canvey electrical impulses from Av node to apex of myocardium where wave of ventricular contraction begins. ❖ Normally the SA node generate impulses, but in abnormal condition AV node, bundle of his and every part of purkinje fibres can generate impulses. ❖ The purkinje fibres transmit eleclrical impulses	**T**: Explain with power point presentation. **S**: Listen and takes notes	**Q:** ask about atrioventicular bundle.

S. No.	Time	Specific objective	Content	Teaching Learning activity	Evaluation
			from the AV node to the apex of themyocardium where wave of ventricular contraction begins, then sweeps upwards and outwards , pumping blood in to the pulmonary artery and the aorta.		
5.	**10min**	To explain the route of impuse transmission in myocardium.	**Route of cardiac impulse transmission (CONDUCTIVITY)-** Whether the impulses generated normally in SA node or abnormally in AV node or bundle of his, spreads to distant parts of heart. The impulses follow the route as under : impulses generated in SA node→conducted via the atria to the AV node →impulse move via the bundle of his→then via the Rt and Lt bundles→via the arbonisation of purkinje fibres.	**T**: Explain with power point presentation. **S**: Listen and takes notes	Q: ask about conductivity of impulses in heart.
6.	**20 min**	To describe the cardiac cycle	**THE CARDIAC CYCLE** : - **Introduction** – • At a heart rate of 75 per minute when heart is beating regularly, an individual cardiac cycle lasts for 0.8 second. • During each cycle the right heart and left heart	**T**: Explain with power point presentation. **S**: Listen and takes notes	**Q:** ask about cardiac cycle

S. No.	Time	Specific objective	Content	Teaching Learning activity	Evaluation
			receive blood from corresponding venous system and pumps into the corresponding atrial system. These evnts recur cyclically until death of the individual. • The heart act as pump and it's action consist of a series of events known as the cardiac cycle. • The period of contraction is called by systole. • The period of relaxation is called diastole. **STAGE OF THE CARDIAC CYCLE** : - ❖ Normal no of cardiac cycle per minute ranges from 60 to 80. ❖ Each Cardiac cycle last about 0.8 of a second & consist of : ***Arterial systole** :- contraction of the atria (0.1 sec). * **Ventricular systole** :- contraction of the ventricular (0.3 sec). * **Complete cardiac diastole** -relaxation of atria & ventricular (0.4 sec). We starts the description of cardiac cycle from atrail		

S. No.	Time	Specific objective	Content	Teaching Learning activity	Evaluation
			filling. The SVC and IVC transports deoxygenated blood into the right atrium and at the same time four pulmonary veins bring oxygenated blood into the left atrium. The valves of the atrioventricular valves are open ad blood passively flows through the ventricles. **ATRIAL SYSTOLE(0.1 sec):-** The SA node triggers a wave of contraction that spreads over the myocardium of the aorta, emptying the atria and completing ventricular filling. **VENTRICULAR SYSTOLE(0.3 SEC)-** When the electrical impulses reach the AV node it is slowed down , delaying atrioventricular transmission. This allow the atria to complete atrial contraction before ventricles start systole. After the brief delay, the AV node trigger the impulse, which quickly spreads to the ventricular muscle via the AV bundle, purkinje fibres. This result in a wave of contraction which sweeps upward from the apex of heart and cross the walls of both ventricles. It pumps the blood into the pulmonary		

S. No.	Time	Specific objective	Content	Teaching Learning activity	Evaluation
			artery and the aorta. The high pressure generated during the ventricular systole (contraction) forces the atrioventricular valves to close, preventing backflow of blood into the atria. **COMPLETE CARDIAC DIASTOLE (0.4 SEC)=** After contraction of the ventricles, there is complete cardiac diastole, a period of 0.4 sec, when atria and ventricles are relaxed. During this period myocardium recovers ready for the next heart beat. And the atria refill ready for the next cycle.		

Summary (10 min) :- sumaries the topics as under -

- Conductive system of heart.
- Sinoatrial node
- Atrioventricular node
- Bundle of his
- Purkinje fibres
- Conductivity in impulses in heart muscles.
- Cardiac cycle

Assignment:- write in brief about conductive system of heart. Draw a diagram of cardiac cycle and explain about it.

Ealuation:- unit test at the end of unit IV.

Bibligraphy:-

Wagh anne and Grant Allison, " ross and Wilson anatomy and physiology in health and illness" 7th edition 2014, Churchill livingston Elsevier, pp 90-93.

Choudhary sujit k," concise medical physiology" 4th edition 2002, new central book agency(P) ltd, pp-160,173,174,177 .

LESSON PLAN

SUBJECT : Anatomy & Physiology

UNIT : IV (Circulatory system)
TOPIC : **BLOOD VESSELS: Types, Structure, Position**

GROUP : G.N.M. I YEAR

PLACE : Class Room & Demonstration Room

DATE & TIME : 40 MINUTE

TEACHING METHOD: Lecture Cum Discussion

A V AIDS :Blackboard&Chalk, Chart, PPT.

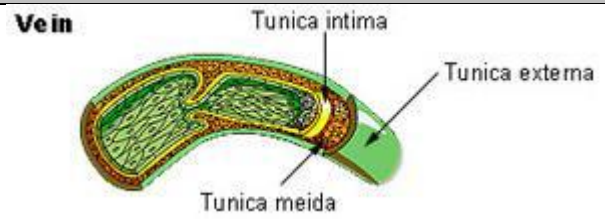
GENERAL OBJECTIVE: At the end of class student will be able to gain knowledge about types, structure & position of blood vessels.

SPECIFIC OBJECTIVES: At the end of class student will be able to:-

1. To enumerate various type s of blood vessels.
2. To explain various structure of blood vessels.
3. To discuss position of blood vessels.

S.No.	Time	Specific Objective	Content	Teaching Learning activity	Evaluation
1	**10 mins**	To Enumerate Various Type of Blood Vessels	**<u>Introduction:</u>** The heart pump blood into vessels that vary in structure, size & function. **<u>Types of blood vessels:</u>** **Arteries & arterioles:** Transport blood away from heart**.** **Veins and veinules:** ► Return blood at low pressure to the heart ► Smallest veins are called venules. **Capillaries:** ▪ The smallest arterioles break up into a number of minute vessels called capillaries. The capillaries open into venules.	T: Explain with power point presentation. S: Listen and takes notes	Q: List all types of blood vessels
2	**15 mins**	**To explain structure of various blood vessels.**	**<u>Structure of various blood vessels:</u>** **<u>Arteries:-</u> The wall consists of layers of tissue of aorta are as follows** ► *Tunica adventitia*- outer fibrous layer. ► *Tunica media*- Middle layer of smooth	T: Explain with power point presentation. S: Listen and takes notes	Q: ask about structure of blood vessels

S.No.	Time	Specific Objective	Content	Teaching Learning activity	Evaluation
			Muscle & elastic tissue. ► *Tunica intima*- Inner lining of squamous Epithelium called vascular epithelium. This layer is very smooth and silky in health. This layer is in direct contact with blood. It is supported externally by elastic fibres called *lamina propria.* **In smaller arteries and <u>Arterioles</u>** , the amount of elastic tissue both in intima and media are much less, proportion of *smooth muscle tissue* in tunica media increases. **<u>Capillaries:-</u>** Capillaries walls consist of a single layer of endothelial cellsstanding on the basement layer. **<u>Vein:-</u>** Walls of veins are thinner then arteries ►They also have all three layer of tissue as arteries. ►some veins have valves which prevent back flow of blood.		

S.No.	Time	Specific Objective	Content	Teaching Learning activity	Evaluation
			 The walls of veins have the same three layers as the arteries. Although all the layers are present, there is less smooth muscle and connective tissue. This makes the walls of veins thinner than those of arteries, which is related to the fact that blood in the veins has less pressure than in the arteries. . Medium and large veins have venous valves, similar to the semilunar valves associated with the heart, that help keep the blood flowing toward the heart. Venous valves are especially important in the arms and legs, where they prevent the backflow of blood in response to the pull of gravity.		

S.No.	Time	Specific Objective	Content	Teaching Learning activity	Evaluation
3	**5 mins**	**To discuss the position of blood vessels**	**Arteries:-** these are situated deep in the muscles because they carry oxygenated blood with pressure from heart. **Vein:-**They are situated on surface of body which carry deoxygenated blood from body to heart.	T: Explain with power point presentation. S: Listen and takes notes	Q: ask about position of blood vessels

Summary (10 min) :- sumaries the topics as under -

1- List various types of blood vessels.
2- What are positions of blood vessels.
3- Explain structure of blood vessels (arteries and veins).

Assignment:- List & explain various types of Blood vessels. Draw a labelled diagram of structure of aorta.

Ealuation:- Unit test at the end of unit IV.

Bibligraphy:-

1- Wagh anne and Grant Allison, " ross and Wilson anatomy and physiology in health and illness" 7th edition 2014, Churchill livingston Elsevier, pp 83-84.
2- Choudhary sujit k," concise medical physiology" 4th edition 2002, new central book agency(P) ltd, pp-195 .

LESSON PLAN

SUBJECT **:** Anatomy & Physiology

UNIT **:** IV (**Circulatory system**)

TOPIC **: Circulation of Blood** (topic no 250)

GROUP **:** G.N.M. I Year

PLACE **:** Class Room & Demonstration Room

DATE & TIME **:** 60 Minute

TEACHING METHOD: Lecture cum Discussion

A V AIDS **:** Blackboard & Chalk, Chart, PPT.

GENERAL OBJECTIVE: At the end of class student will be able to gain knowledge about circulation of blood

SPECIFIC OBJECTIVES: At the end of class student will be able :-

- To Introduce About Circulation Of Blood
- To Explain Pulmonary Circulation.
- To Describe General Circulation.

S.No.	Time	Specific Objective	Content	Teaching Learning activity	Evaluation
1.	**5 min**	To introduce about circulation of blood.	**Introduction:** Circulation of blood in the body is continuous but it is easy to describe it in two parts: • Pulmonary circulation • General circulation.	**T**: Explain with power point presentation. **S**: Listen and takes notes	
2.	**10 min**	To Explain pulmonary circulation	**Pulmonary circulation :** • Circulation of blood from the right ventricle of the heart to the lungs and back to the left atrium. In lungs carbon dioxide is excreted and oxygen is absorbed. • The pulmonary artery or trunk carrying deoxygenated blood leaves the upper part of the right ventricle of the heart. It passes upward and divides into two – left and right pulmonary arteries. • The left pulmonary artery runs to the left lung where it divides in two branches, one passing into each lobe. • The right pulmonary artery runs to the root of the right lung where it divides into two branches. The larger artery carry blood to middle and lower lobe. • Within the lungs, these vessels divide and	**T**: Explain with power point presentation. **S**: Listen and takes notes	**Q:** ask about Pulmonary circulation.

S.No.	Time	Specific Objective	Content	Teaching Learning activity	Evaluation
			subdivide into smaller arteries, arterioles, and capillaries. • The exchange of gases takes place between the blood into capillaries and air in the alveoli of lungs. • In each lung, the oxygenated blood in capillaries merge into larger venules and eventually form veins and two pulmonary veins. • Two pulmonary veins leave each lung, returning oxygenated blood to the left atrium of the heart. During atrial systole this blood is pumped into the left ventricle, and during ventricular systole it is forced into the aorta, the first artery of systemic circulation.		
3.	**15min**	To learn the general or systemic circulation.	**<u>Systemic or General circulation:</u>** • During ventricular systole, blood from the left ventricle is pumped into the aorta. It continues as branches of aorta. The branches repeatedly give rise to further branches, which are narrower and narrower and ultimately they	**T**: Explain with power point presentation. **S**: Listen and takes notes	Q: ask about general circulation

S.No.	Time	Specific Objective	Content	Teaching Learning activity	Evaluation
			become arterioles. The arterioles open into the capillaries. The capillaries open into the venules on other side of arteriole. The venule unite with other venule to form veins, the veins unite with other vein and ultimately form two great veins i.e. Superior and Inferior vana cava. These open into the right atrium. This portion of vascular tree is called **systemic or general circulation.** Blood vessels include branches of aorta which are : **1- <u>Thoracic aorta :</u>** • Ascending aorta : Right & left coronary arteries are it's only branches • Arch of the aorta : three branches are – » brachiocephalic artery » left common carotid artery » left subclavian artery • Descending aorta in the thorax: it give		

S.No.	Time	Specific Objective	Content	Teaching Learning activity	Evaluation
			off many paired branches: » Bronchial arteries. » Oesophageal arteries. » Intercostal arteries. 2- **Abdominal aorta:** at the level of forth lumbar vertebra it divide in to- » Right common iliac arteries. » Left common iliac arteries. **Paired branches :** • Inferior phrenic arteries. • Renal arteries . • Testicular Arteries. • Ovarin arteries. **Unpaired branches : it devide in three branches:** • Left gastric artery. • Splenic artery. • Hepatic Artery.		
4.	**15 mins**	To explain about the portal circulation	**Portal circulation:** In portal circulation, venous blood from the capillary bed of the abdominal part of the digestive system , the spleen, the pancreas, travel first to the liver. Where it passes through a second capillary bed, the hepatic	T: Explain with power point presentation. S: Listen and takes notes	Q: ask about portal circulation

S.No.	Time	Specific Objective	Content	Teaching Learning activity	Evaluation
			sinusoid, before entering into the general circulation via IVC and SVC. This supply of blood ensures that the composition of blood leaving the alimentary tract can be appropriately regulated. It also ensures that unwanted and / or potentially toxic materials like drugs are eliminated before the blood is returned in general circulation. **Portal vein :** This formed by the union of several veins, each drain blood from the area supplied by the corresponding artery. 1. The splenic vein 2. The inferior mesenteric vein 3. The superior mesenteric vein 4. The gastric vein 5. The cystic vein		

Summary (10 min) :- sumaries the topics as under -

1- Explain in brief about pulmonary circulation.
2- Explain in brief about systemic circulation.
3- Explain portal circulation.

Assignment:- Discuss general and portal circulation. Draw a labelled diagram of structure of aorta with its branches.

Ealuation:- Unit test at the end of unit IV.

Bibligraphy:-

1- Wagh anne and Grant Allison, " ross and Wilson anatomy and physiology in health and illness" 7th edition 2014, Churchill livingston Elsevier, pp 100-111.
2- Choudhary sujit k," concise medical physiology" 4th edition 2002, new central book agency(P) ltd, pp-194-195 .

LESSON PLAN

SUBJECT : Anatomy & Physiology

UNIT : 4 Cardio vascular systems

TOPIC : **Blood Pressure & Pulse**

GROUP : G.N.M. I YEAR

PLACE : Class Room & Demonstration Room

DATE & TIME : 60 MINUTE

TEACHING METHOD: Lecture Cum Discussion

A V AIDS :Blackboard, Chalk, Chart, L.C.D., Computer.

GENERAL OBJECTIVE: At The End Of Class Student Will Be Able To Gain Knowledge About Blood Pressure & Pulse

SPECIFIC OBJECTIVES: At The End Of Class Student Will Be Able To:-

1. Define blood pressure.
2. Classify blood pressure.
3. Explain cardiac output.
4. Discuss about control of blood pressure.
5. Define pulse.
6. Explain characteristics of pulse.
7. Describe factor affecting pulse.

INTRODUCTION:- 2 MIN :- the blood pressure and pulse are the vital signs of the body, which are related to the most vital organ of the body, heart. Both should be always in normal range.

S.No.	Time	Specific Objective	Content	Teaching Learning activity	Evaluation
1	5 mins	To define blood pressure	**<u>Blood pressure:</u>** It is the force or pressure that is exerted by the blood on the walls of the blood vessels. The systemic arterial pressure maintains the essential flow of blood into and out of the organs of the body. This systemic arterial pressure also know as simple arterial blood pressure , is result of discharge of blood from the left ventricle into already full aorta. The BP varies according to the time of the day, posture, gender and age of individual.	T: Explain with power point presentation. S: Listen and takes notes	What do you mean by blood pressure?
2	10 mins	To classified blood pressure	**<u>Systolic blood pressure:</u>** When left ventricle contracts and pushes blood in to aorta, the pressure produced with in arterial system is called the systolic blood pressure. In adult it is 120 mm of Hg **<u>Diastolic blood pressure:</u>** During complete cardiac diastole the heart is resting following the ejection of blood the pressure within the arteries	T: Explain with power point presentation. S: Listen and takes notes	Q: List all types of blood pressure

S.No.	Time	Specific Objective	Content	Teaching Learning activity	Evaluation
3	10 min	To explain cardiac out put	is much lower & is called Diastolic blood pressure. In adult it is 80 mm of Hg BP:- 120/80mmHg **<u>cardiac output</u>:** ► the cardiac output is the amount of blood ejected from each ventricle every minute. The amount expelled by each contraction of each ventricle is stroke volume. The **cardiac output** is determine by the stroke volume and heart rate. C.O. = stroke volume x heart rate. (70ml x 72)= 5L/min		
4	10 min	Factors determining BP	**Factors determining BP:-** **Blood pressure:-** cardiac output x peripheral resistance • cardiac output • Peripheral or arteriolar resistance • autoregulation		
4	10 mins	To discuss about control of blood	**<u>B.P. is control in two ways-</u>** * **short term control**: it involve	T: Explain with power point	Q: ask about structure of

S.No.	Time	Specific Objective	Content	Teaching Learning activity	Evaluation
		pressure	1- baro receptor reflex 2- chemo receptor 3- circulating hormone 4- higher centres in brain * **Long term control**: it involve regulation of blood volume by kidney & rennin- angiotensin- aldosterone system	presentation. S: Listen and takes notes	blood pressure
5	05 mins.	To define pulse	**Pulse**:- the alternate expansion and recoil of elastic arteries after each systole of the left ventricle create a travelling pressure wave that is called the pulse. A wave of distension and elongation felt in an artery wall due to contraction of the left ventricle. Sites of pulse :- 1. Apical, 2. Temporal, 3. Facial, 4. Carotid, 5. Brachial, 6. Radial, 7. Femoral, 8. Popliteal, 9. Posterior tibial, 10. Dorsalis pedis Normal pulse :- 72 bpm (60-80 average)	T: Explain with power point presentation. S: Listen and takes notes	Q: ask about pulse

S.No.	Time	Specific Objective	Content	Teaching Learning activity	Evaluation
6	10 mins.	To explain characteristics of pulse	**Characteristics of pulse:-** ➢ Rate: at which heart is beating. ➢ Regularity: Interval between beats should be equal. ➢ Volume of beat: It should to possible to compress the artery with moderate pressure ➢ Tension- artery wall should feel soft & pliant under the finger.	T: Explain with power point presentation. S: Listen and takes notes	Q: ask about Factors affecting pulse
7	05 mins	To describe factors affecting pulse	**Factors affecting pulse** ✓ Autonomic nervous system ✓ Circulating chemicals: epinephrine, norepinephrine ✓ Position: upright-faster, lying down-slower than upright ✓ Exercise:- increased ✓ Emotional state:- increased in anxiety , stress, happiness, fear ✓ Gender:- faster in women ✓ Age:- faster in small children	T: Explain with power point presentation. S: Listen and takes notes	

S.No.	Time	Specific Objective	Content	Teaching Learning activity	Evaluation
			✓ Temperature ✓ Baroreceptor reflex ✓ Narrowed tissue of peripheral arteries ✓ Heart is unable to generate enough force due to diseased.		

Summary:-

1- Classify B.P.
2- Ask normal value of B.P.
3- What are Charactristics of pulse?

Assignment:- List various factor which control B.P.

Evaluation:- Class Test after Completion of Topic.

Bibliography:-

- Waugh A. And Grant A., "Ross & Wilson – Anatomy & physiology in health and illness, Churchill livingstone Elsevier, 12th edition, 2014, p.n . 96-99
- Tortora Gerard J., Grabowski S.R. , " principles of anatomy and physiology" Benzamins Cummins, 8th edition 1999, p.n. 621-622,631