

## PATHOLOGY AND GENETICS

**Placement: Second Year**

**Theory – 45 Hrs**  
**Pathology – 30 Hrs**  
**(Theory 20Hrs+Practical 10 Hrs)**  
**Genetics-15 hrs**

### A: PATHOLOGY

**Course Description** - This course is designed to enable students to acquire knowledge of pathology of various disease conditions and apply this knowledge in practice of nursing.

**Specific objectives** – at the end of the course the students are able to:

1. Understand the basic concepts of pathology.
2. Understand the pathophysiological changes in different system disorders.
3. Assist for various pathological tests conducted in the clinical field.
4. Collect and send the pathological tests and infer their results with patient conditions.

Unit	Time (Hrs)	Learning Objective	Contents	Teaching Learning Activities	Assessment Methods
<b>I</b>	<b>T=03</b>	1. Define the common terms used in pathology 2. Appreciate the deviations from normal to abnormal structure and functions of the body system	<b>General Pathology</b> <input type="checkbox"/> Introduction to pathology <ul style="list-style-type: none"> <li>● Importance of the study of pathology</li> <li>● Definition of terms</li> <li>● Methods &amp; techniques</li> <li>● Cellular &amp; tissue changes</li> <li>● Infiltration and regeneration</li> <li>● Inflammations and infections</li> <li>● Wound healing</li> <li>● Vascular changes</li> </ul> <input type="checkbox"/> Cellular growth and neoplasms <ul style="list-style-type: none"> <li>● Normal and cancer cell</li> </ul>	<ul style="list-style-type: none"> <li>● Lecture</li> <li>● Discussion</li> <li>● Drug study/ presentations</li> </ul>	<ul style="list-style-type: none"> <li>● Short answers</li> <li>● Objective type</li> </ul>

			<ul style="list-style-type: none"> <li>• Benign and malignant growths</li> <li>• In situ carcinoma</li> <li>□ Disturbances of fluid and electrolyte balance, role of nurse</li> </ul>		
<b>II</b>	<b>T=10 P=05</b>	Explain pathological changes in disease conditions of various systems	<p><b>Special Pathology</b></p> <ul style="list-style-type: none"> <li>• Pathological changes in disease conditions of various systems: <ul style="list-style-type: none"> <li>• Respiratory tract <ul style="list-style-type: none"> <li>➤ Tuberculosis, Bronchitis,</li> <li>➤ Pleural effusion &amp; Pneumonia</li> <li>➤ Lung abscess, emphysema, bronchiectasis</li> <li>➤ Bronchial asthma, chronic obstructive pulmonary disease and tumours.</li> </ul> </li> <li>• Cardiovascular system <ul style="list-style-type: none"> <li>➤ Pericardial effusion</li> <li>➤ Rheumatic heart disease</li> <li>➤ Infective endocarditis, atherosclerosis</li> <li>➤ Ischemia, infarction &amp; aneurism</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Explain using charts, slides, specimen, x-rays and scans</li> <li>• Visit to pathology lab, endoscopy unit and OT</li> </ul>	<ul style="list-style-type: none"> <li>• Short answers</li> <li>• Objective type</li> </ul>
			<ul style="list-style-type: none"> <li>• Gastrointestinal tract <ul style="list-style-type: none"> <li>➤ Peptic ulcer, Typhoid</li> <li>➤ Carcinoma of GI tract buccal, esophageal, gastric and intestinal</li> </ul> </li> <li>• Liver, Gall bladder &amp; pancreas <ul style="list-style-type: none"> <li>➤ Hepatitis, chronic liver abscess, Cirrhosis</li> <li>➤ Tumours of liver, gall bladder and pancreas</li> <li>➤ Cholecystitis</li> </ul> </li> <li>• Kidneys &amp; Urinary tract <ul style="list-style-type: none"> <li>➤ Glomerulonephritis, pyelonephritis</li> <li>➤ Calculi, Renal failure, Renal carcinoma &amp; Cystitis</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Explain using charts</li> </ul>	<ul style="list-style-type: none"> <li>• Short answers</li> <li>• Objective type</li> </ul>

			<ul style="list-style-type: none"> <li>• Male genital system <ul style="list-style-type: none"> <li>➤ Cryptorchidism, testicular atrophy</li> <li>➤ Prostatic hyperplasia, Carcinoma penis &amp; prostate</li> </ul> </li> <li>• Female genital system <ul style="list-style-type: none"> <li>➤ Fibroids</li> <li>➤ Carcinoma cervix &amp; endometrium</li> <li>➤ Vesicular mole, choriocarcinoma</li> <li>➤ Ectopic gestation</li> <li>➤ Ovarian cyst &amp; tumours</li> </ul> </li> <li>• Cancer breast</li> <li>• Central Nervous System <ul style="list-style-type: none"> <li>➤ Hydrocephalus, meningitis, encephalitis</li> </ul> </li> <li>• Vascular disorders – thrombosis, embolism <ul style="list-style-type: none"> <li>➤ Stroke, paraplegia, quadriplegia</li> <li>➤ Tumours, meningiomas-gliomas</li> </ul> </li> <li>• Metastatic tumour</li> <li>• Skeletal system <ul style="list-style-type: none"> <li>➤ Bone healing, osteoporosis, osteomyelitis</li> </ul> </li> <li>• Arthritis and tumours</li> </ul>		
<b>III</b>	<b>T=04</b> <b>P=03</b>	Describe various laboratory test in assessment and monitoring of disease conditions	<p><b>Clinical Pathology</b></p> <ul style="list-style-type: none"> <li>• Various blood and bone marrow tests in assessment and monitoring of disease conditions <ul style="list-style-type: none"> <li>➤ Hemoglobin</li> <li>➤ RBC, white cells &amp; platelet counts</li> <li>➤ Bleeding time, clotting time and prothrombin time</li> <li>➤ Blood grouping and cross matching</li> <li>➤ Blood chemistry</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Short answers</li> <li>• Objective type</li> </ul>

			<ul style="list-style-type: none"> <li>➤ Blood culture</li> <li>➤ Serological and immunological tests</li> <li>➤ Other blood tests</li> <li>➤ Examination of bone marrow</li> <li>➤ Methods of collection of blood specimen for various clinical pathology, biochemistry, microbiological tests, inference and normal values</li> </ul>		
<b>IV</b>	<b>T=02</b> <b>P=01</b>	Describe the laboratory tests for examination of body cavity fluids, transudates and exudates	<p><b>Examination of body cavity fluids, transudates and exudates</b></p> <ul style="list-style-type: none"> <li>• The laboratory tests used in CSF analysis</li> <li>• Examination of other body cavity fluids, transudates and exudates sputum, wound discharge etc.</li> <li>• Analysis of gastric and duodenal contents</li> <li>• Analysis of semen- sperm count, motility and morphology and their importance in infertility</li> <li>• Methods of collection of CSF and other cavity fluids specimen for various clinical pathology, biochemistry, microbiology tests, inference and normal values.</li> <li>• Nurse's role in assisting and preparing the patient for these diagnostic tests</li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Short answers</li> <li>• Objective type</li> </ul>

V	T=01 P=01	Describe the laboratory tests for examination of Urine and Faeces	<b>Urine &amp; Faeces</b> <ul style="list-style-type: none"> <li>• Urine <ul style="list-style-type: none"> <li>➤ Physical characteristics</li> <li>➤ Analysis</li> <li>➤ Culture and sensitivity</li> </ul> </li> <li>• Faeces <ul style="list-style-type: none"> <li>➤ Characteristics</li> <li>➤ Stool examination: occult blood, ova, parasite and cyst, reducing substance etc.</li> </ul> </li> <li>• Methods of collection for various tests, inference and normal values</li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Short answers</li> <li>• Objective type</li> </ul>
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**Lab: 10 Hrs**

**Visits to: -**

- Pathology lab
- Endoscopy unit
- Operation Theatre
- Routine examination of urine
- Hb estimation
- Cell counts

**Bibliography - Pathology**

1. Harsh Mohan : Text book of Pathology, IV Edition Jaypee Brothers, New Delhi 2000.
2. Heller : Pathology: Comprehensive Review 1999 Edition.
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4. Carol Mattson Porth : Pathophysiology ,VII Edition Lippincott Philadelphia 2002.
5. Ramzi S Cotran etal : Robins Pathologic basis of disease, VI Edition, W B Saunders Coy USA 1999.
6. JCE Underwood : General and systemic pathology , III Edition, Churchill liuvingstone , Philadelphia 2000.
7. Canjanov and Linder : Anderson's pathology, X Edition , Lippincott , Philadelphia 1996.
8. Vinay Kumar M D etal : Basic Pathology , VI Edition W B Saunders Coy USA 1997.

9. Walter F Coulson : Surgical Pathology , II Edition J B Lippincott Coy Philadelphia, 1988.
10. Parakrama Chandrasoma : Concise pathology, III Edition, Hall International, USA,1998.
11. Lynne's Gracia, M S & David A Brucker : Diagnostic medical parasitology , III Edition ASM press, Washington'2005.
12. Haber et al : Differential diagnosis in pathology , W B Saunders coy, Philadelphia, 2002.

## B – GENETICS

**Placement: Second Year**

**Theory – 15 Hours**

**Course Description** - This course is designed to enable students to acquire understanding of Genetics, its role in causation and management of defects and diseases.

**Specific objectives** – At the end of the course students are able to:

1. Understand the basic concepts of genetics
2. Understand maternal, prenatal and genetic influences on development of defects and diseases
3. Understand the significance of genetic testing.
4. Understand genetic disorders in various age groups.
5. Appreciate services related to genetics

Unit	Time (Hrs)	Learning Objective	Contents	Teaching Learning Activities	Assessment Methods
<b>I</b>	<b>03</b>	Explain nature, principles and perspectives of heredity	<p><b>Introduction</b></p> <ul style="list-style-type: none"> <li>• Practical application of genetics in Nursing</li> <li>• Impact of genetic condition on families</li> <li>• Review of cellular division mitosis and meiosis</li> <li>• Characteristics and structure of genes</li> <li>• Chromosomes – sex determination</li> <li>• Chromosomal aberrations pattern of inheritance               <ul style="list-style-type: none"> <li>➤ Medallion theory of inheritance</li> <li>➤ Multiple allots and blood groups</li> <li>➤ Sex linked inheritance</li> <li>➤ Mechanism of inheritance</li> <li>➤ Errors in transmission (Mutation)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Explain using charts, slides</li> </ul>	<ul style="list-style-type: none"> <li>• Short answers</li> <li>• Objective type</li> </ul>

II	03	Explain maternal, prenatal and genetic influences on development of defects and diseases	<p><b>Maternal, prenatal and genetic influences on development of defects and diseases</b></p> <ul style="list-style-type: none"> <li>➤ Conditions affecting the mother: genetic and infections</li> <li>➤ Consanguinity atopy</li> <li>➤ Prenatal nutrition and food allergies</li> <li>➤ Maternal age</li> <li>➤ Maternal drug therapy</li> <li>➤ Prenatal testing and diagnosis</li> <li>➤ Effect of radiation, drugs and chemicals</li> <li>➤ Infertility</li> <li>➤ Spontaneous abortion</li> <li>➤ Neural tube defects and the role of folic acid in lowering the risks</li> <li>➤ Down syndrome (Trisomy 21)</li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Explain using charts, slides</li> </ul>	<ul style="list-style-type: none"> <li>• Short answers</li> <li>• Objective type</li> </ul>
III	02	Explain the screening methods for genetic defects and diseases in neonates and children	<p><b>Genetic tests in neonates and children</b></p> <ul style="list-style-type: none"> <li>• Screening for <ul style="list-style-type: none"> <li>➤ Congenital abnormalities</li> <li>➤ Developmental delay</li> <li>➤ Dysmorphism</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Explain using charts, slides</li> </ul>	<ul style="list-style-type: none"> <li>• Short answers</li> <li>• Objective type</li> </ul>
IV	02	Identify genetic disorders in adolescents and adults	<p><b>Genetic conditions of adolescents and adults</b></p> <ul style="list-style-type: none"> <li>• Cancer genetics, Familial cancer</li> <li>• Inborn errors of metabolism</li> <li>• Blood group alleles and hematological disorders</li> <li>• Genetic haemochromatosis</li> <li>• Huntington's disease</li> <li>• Mental illness</li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Explain using charts, slides</li> </ul>	<ul style="list-style-type: none"> <li>• Short answers</li> <li>• Objective type</li> </ul>

V	05	Describe the role of nurse in genetic services and counseling	<b>Services related to Genetics</b> <ul style="list-style-type: none"> <li>• Genetic testing</li> <li>• Human genome project</li> <li>• Gene therapy</li> <li>• The Eugenics movement</li> <li>• Genetic counseling</li> <li>• Legal and ethical issues</li> <li>• Role of nurse</li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Explain using charts, slides</li> </ul>	<ul style="list-style-type: none"> <li>• Short answers</li> <li>• Objective type</li> </ul>
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### **Bibliography –(Genetics)**

1. S Mandal: Fundamentals of Human Genetics II Edition New Central Book Agency, Kolkota 1996
2. S D Gangane : Human Genetics II Edition, Saurabh Printers, Noida.
3. Jorde Carey BamshadWhite : Medical Genetics, Mosby 2003.
4. J A Fraser Roberts : An introduction to medical genetics ,V Edition, Oxford University,1970.
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7. Edmund W Sinnott : Principles of Genetics V Edition Mcgeaw hill book company, Newyork 1950.
8. P C Winter, G I Hickey : Instant notes in genetics , Viva books Pvt Ltd, New Delhi 2000.
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13. Pansky Ban, Review of Medical Embryology. Macmillian Publishing Company, New York 1982.
14. Smell, Richard S: Clinical Embryology for medical students, Little Brown and Company, Boston,1972.
15. Langman , Jan :Medical Embryology,William& Wilkins, Baltimore 1973.

## Evaluation Scheme

**Internal Assessment:**

**Maximum 25 Marks**

**Theory:**

**15 Marks**

	<b>Pharmacology</b>	<b>Pathology and genetics</b>	<b>Total Marks</b>	<b>Average Out of</b>
<b>Mid-term</b>	30	20	50	--
<b>Pre-final</b>	40	35	75	--
<b>Total</b>			<b>125</b>	<b>15</b>

(125 Marks to be converted in to 15 Marks for Internal Assessment (Theory))

## Assignments: Two

a) Pharmacology - Drug Study / Drug Presentation 25 Marks

b) Pathology - Preparation of Patient for diagnostic Test 25 Marks

**Total: 50 Marks**

(50 Marks to be converted in to 10 Marks for Internal Assessment (Assignments))

## External Assessment

**University Examination (Theory)**

**75 Marks**

**Format for Assignment: -**

### i) Drug study

- **Index of drug**
- **Introduction**
- **Classification of drugs**
- **Factors affecting action of drugs**
- **Name of the drug ( Trade & Pharmaceutical name )**
- **Preparation, strength and dose**
- **Indications and contraindications**
- **Actions**
- **Adverse effects and drug interactions**
- **Nursing responsibility**
- **Conclusion**
- **References**

**Evaluation criteria**

Planning and organization -----	05
Content -----	10
Nursing responsibility -----	05
Conclusion & References -----	05
<b>Total</b>	<b>25</b>

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**ii) Preparation of patients for diagnostic tests**

- **Type of investigation**
- **Indications**
- **Preparation of the patient**
- **Do's and Dont's**
- **Documents to be carried along**
- **Complications**
- **Aftercare of the patient**
- **Conclusion**
- **Reference**

**Evaluation criteria**

<b>Criteria</b>	<b>Marks</b>
Organization-----	10
Content -----	10
Conclusion & References -----	05
<b>Total</b>	<b>25</b>