GENETICS

PLACEMENT:IVSEMESTER

DESCRIPTION: Thiscourseisdesignedtoenablestudentstoacquireknowledgeofpathologyofvariousdiseaseconditions, understanding of genetics, its role in causation and management of defects and diseases and to apply thisknowledgein practiceof nursing.

COMPETENCIES: Oncompletionofthecourse,thestudentswillbeableto

1. Applytheknowledgeofpathology inunderstandingthedeviationsfromnormaltoabnormal pathology
2. Rationalizethe variouslaboratory investigationsindiagnosingpathologicaldisorders
3. Demonstratetheunderstandingofthemethodsofcollectionofblood,bodycavityfluids,urineandfecesforvarioustests
4. Applytheknowledgeofgeneticsinunderstandingthevariouspathologicaldisorders
5. Appreciatethevariousmanifestationsinpatientswithdiagnosedgeneticabnormalities
6. Rationalizethespecificdiagnostictestsinthedetectionofgeneticabnormalities.
7. Demonstratetheunderstandingofvariousservicesrelatedtogenetics.

GENETICS

COURSEOUTLINE

T–Theory

Unit	Time (Hrs)	LearningOutcomes	Content	Teaching/LearningActivities	AssessmentMethods
I	2(T)	Explain nature,principles andperspectives ofheredity	**Introduction:** • Practicalapplicationofgeneticsin nursing • Impactof geneticconditiononfamilies • Reviewofcellulardivision:mitosisand meiosis • Characteristicsandstructureofgenes • Chromosomes:sexdetermination • Chromosomalaberrations • Patternsofinheritance • Mendeliantheoryofinheritance • Multipleallotsandbloodgroups • Sexlinkedinheritance • Mechanismofinheritance • Errorsintransmission(mutation)	• Lecture • Discussion • Explainusingslides	• Shortanswer • Objectivetype

II	2(T)	Explain maternal,prenatal and geneticinfluences ondevelopment ofdefectsanddiseas es	**Maternal, prenatal and geneticinfluencesondevelopmentof defectsanddiseases** • Conditions affecting the mother:geneticand infections • Consanguinityatopy • Prenatalnutritionandfoodallergies • Maternalage • Maternaldrugtherapy • Prenataltestinganddiagnosis • EffectofRadiation,drugsand chemicals • Infertility • Spontaneousabortion • Neural Tube Defects and the role offolicacid in loweringtherisks • Downsyndrome(Trisomy21)	• Lecture • Discussion • Explainusingslides	• Shortanswer • Objectivetype
III	2(T)	Explain the screeningmethods for geneticdefectsanddis easesinneonatesandc hildren	**Genetic testing in the neonates andchildren** • Screeningfor o Congenitalabnormalities o Developmentaldelay o Dysmorphism	• Lecture • Discussion • Explainusingslides	• Shortanswer • Objectivetype
IV	2(T)	Identify geneticdisorders inadolescentsandadu lts	**Geneticconditionsofadolescentsand adults** • Cancergenetics:Familialcancer • Inbornerrorsof metabolism • Blood group alleles and hematologicaldisorder • Genetichaemochromatosis • Huntington‘sdisease • Mentalillness	• Lecture • Discussion • Explainusingslides	• Shortanswer • Objectivetype
V	2(T)	Describe the role ofnurse in geneticservices andcounselling	**Servicesrelatedtogenetics** • Genetictesting • Genetherapy • Geneticcounseling • LegalandEthicalissues • Roleofnurse	• Lecture • Discussion	• Shortanswer • Objectivetype

DISTRIBUTION OF TEACHING HOURS

STRATEGY		**Teaching hours**	
Didactic	Lectures	08	08
	Tutorials	02	02
Total			10Hrs.

TOPICS & OUTCOMES

Subject	**Number of Themes**	**Number of outcomes**
GENETICS	05	20

DISTRIBUTION OF THEORY HOURS

S. N	Theme	Topics	Teaching hrs.
1	Introduction	Introduction	2(T)
2	Maternal, prenatal and geneticinfluenceson development ofdefectsanddiseases	Maternal, prenatal and geneticinfluenceson development ofdefectsanddiseases	2(T)
3	Genetic testing in the neonates andchildren	Genetic testing in the neonates andchildren	2(T)
4	Geneticconditionsofadolescentsandadults	Geneticconditionsofadolescentsandadults	2(T)
5	Servicesrelatedtogenetics	Servicesrelatedtogenetics	2(T)
TOTAL			10 Hours

						Core Competency		Non Core Competency	
S.NO.	**Theme and total hours allotted (15 hrs)**	**Objectives**	**Topic**	**Code No**	**Competency**	**Must Know**	**Desirable to Know**	**Nice to Know**	**Unit No. & Hours**
1	Introduction 2(T)	At the end of unit students are able to **Knowledge:** Understand and describe the cellular division, chromosomes and sex determination. **Skill:** Analyze the genetic impact for different disease conditions in clinical practice. **Attitude:** Incorporate the knowledge of chromosomes in	Introduction	PATH(II)210:IV/ GEN:S EM1.1	Describe practical application of genetic in nursing and Impact of genetic condition on family.	**Introduction:** • Practicalapplicationofgeneticsinnursing • Impactof geneticconditiononfamilies			½ hour
				PATH(II)210:IV/ GEN:S EM1.2	Explain the cellular division mitosis and meiosis. Define sex and enlist the types of sex determination and Chromosomal aberrations.and	• Reviewofcellulardivision:mitosisandmeiosis • Chromosomes:sexdetermination. • Chromosomalaberrations			½ hour
				PATH(II)210:IV/ GEN:S EM1.3	Describe about the patterns of inheritance and Characteristics ,structure gene. Define the multiple alleles and types blood groups and ABO blood group system and Sex linked inheritance	• Characteristicsandstructureofgenes (1T)	• Patternsofinheritance • Multipleallotsandbloodgroups Sexlinkedinheritance		½ hour
				PATH(II)210:IV/ GEN:S EM1.4	Explain Mendalian theory of inheritance and describe the Mechanism of inheritance and types the errors in		• Mendeliantheoryofinheritance • Mechanismofinheritance		½ hour

		identifying genetic impact for various disease conditions.			transmission(mutation).		Errorsintransmission(mutation) (1T)		
2	**Maternal, prenatal and genetic influencesondevelopmentof defects anddiseases** 2(T)	At the end of unit students are able to **Knowledge:** Describe the mode of transmission of genetic diseases. **Skill:** Counsels regarding role of consanguineous marriages in inheritance of diseases. **Attitude:** Motivates individuals for genetic testing and thereby contribute in preventing hereditary diseases.	Maternal, prenatal and genetic influences on development of defects and diseases	PATH(II)210:IV/ GEN:S EM 2.1	Describe the genetic and infections conditions affecting the mother at the time f pregnancy and Consanguinity atrophy and prenatal nutrition and food allergies and Covid-19 infection during pregnancy	**Maternal, prenatal and geneticinfluences ondevelopmentof defectsanddiseases** • Conditions affecting the mother:genetic and infections • Consanguinityatopy • Prenatalnutritionand foodallergies			½ hour
				PATH(II)210:IV/ GEN:S EM 2.2	Explain the maternal age and maternal drug therapy that influence on development of defects and disease in maternal.	• Maternalage . • Maternaldrugtherapy			½ hour
				PATH(II)210:IV/ GEN:S EM 2.3	Explain prenatal testing and its diagnostic evaluation and effects of radiation, drugs and chemicals on development of defects and disease in maternal.	• Prenataltestinganddiagnosis • EffectofRadiation, drugsandchemicals(1T)			½ hour
				PATH(II)210:IV/ GEN:S EM 2.4	Explain the Infertility , Down syndrome (Trisomy 21), Neural tube defects and enlist role of folic acid in lowering the risks and Spontaneous abortion, discuss about the Effect of		• Infertility • Downsyndrome(Trisomy21)(1T) • Neural Tube		½ hour

					covid-19 infection of mother on newborn Effect of covid-19 infection of mother to newborn.		Defects and the role offolicacid in loweringth erisks • Spontaneousab ortion		
3	**Genet ic testin g in the neona tes andch ildren** 2(T)	At the end of unit students are able to **Knowledge :** Understand and explain congenital abnormalitie s. **Skill:** Identify congenital abnormalitie s. **Attitude:** Provide comprehens ive nursing care to client having congenital abnormalitie s.	Genetic testing in neonates and children	PATH(II)210:IV/ GEN:S EM 3.1	Define Congenital abnormalities and list out the screening test used for detection of congenital abnormalities in neonates and children.	**Genetic testing in the neonates andchildren** • Screeningfor • Congenitalabnor malities(1T)			½ hour
				PATH(II)210:IV/ GEN:S EM 3.2	Explain about the developmental delay.		• Development aldelay		½ hour
				PATH(II)210:IV/ GEN:S EM 3.3	Explain Dysmorphism.		• Dysmorphism(1T)		½ hour
				PATH(II)210:IV/ GEN:S EM 3.4	Discuss the covid-19 infection in newborn				½ hour
4	**Genetic conditi onsofad olescent sandad**	At the end of unit students are able to **Knowledge**	Geneticcond itionsofadole scentsandad ults	PATH(II)210:IV/ GEN:S EM 4.1	Define Cancer genetics and Familial cancer. Enlist its causes.	**Geneticconditions ofadolescentsanad ults** • Cancergenetics:Fam			½ hour

	ults 2(T)	**:** Understand and explain the genetic abnormalities, their causes and signs & symptoms. **Skill:** Identify the client with genetic disorders. **Attitude:** Provide effective nursing care to such clients.		PATH(II)210:IV/ GEN:S EM 4.2	Explain Inborn errors of metabolism with its cause transmission.	ilialcancer • Inbornerrorsof metabolism • Blood group alleles and hematologicaldisorder(1T)			½ hour
				PATH(II)210:IV/ GEN:S EM 4.3	Define mental illness and list out the causes, sign and symptoms, complication and prevention and Detect about the Covid-19 infection affect the genetic condition on adolescent and adults		• Mentalillness(1T)		½ hour
				PATH(II)210:IV/ GEN:S EM 4.4	Define haemochromatosis; explain its causes and types, and Describe the Huntington's disease.		• Genetichaemochromatosisdisease • Huntington's		½ hour
5	**Servicesrelatedtogenetics** 2(T)	At the end of unit students are able to **Knowledge:** Understand the Gene therapy. **Skill:** Provide genetic counseling for genetic testing and assist in gene therapy. **Attitude:**		PATH(II)210:IV/ GEN:S EM 5.1	Define Genetic testing and genetics counseling and services related to genetic counseling. Explain gene therapy.	**Servicesrelatedtogenetics** • Genetictesting • Genetherapy • Geneticcounseling(1T)			½ hour
				PATH(II)210:IV/ GEN:S EM 5.2	Describe the legal and ethical issues in genetic testing and write the role of nurse in genetics testing		• LegalandEthicalissues • Roleofnurse(1T)		½ hour
				PATH(II)210:IV/ GEN:S EM 5.3	Explain eugenics movement.				½ hour

		Perform nurses' role effectively.		PATH(II)210:IV/ GEN:S EM 5.4	Define Human genome project and list out its importance.				½ hour

TEACHING STRATEGY:

Total Hours: 10 Theory Hours: 10

Theory

Continuous Assessment: 10Mark

Sr. No	Assignments	Percentage of Attendance	Allotted marks	Total Marks for attendance
1	Attendance	95-100%	2	2 marks
		90-94%	1.5	
		85-89%	1	
		80-84%	0.5	
		<80%	0	
		Number assignments	Marks	Total Marks
2	Written Assignments	2	2X5	10
3	Seminar/Microteaching/Individual presentation			
4	Group work/Work/Report			
			Total	30/3=10Marks

Modified Tutorials (3 Hours)

Sr. No	Comp. no	TOPIC	Domain	T-L Method	Teaching Hrs
1	PATH(II)210:IV/GEN:SEM 3.1,3.2	Define Congenital abnormalities and list out the screening test used for detection of congenital abnormalities in neonates and children. Explain about the developmental delay.	K,S	Tutorials	1 Hour
TOTAL					**1 Hours**

Formative Assessment

1. Sessional Examinations: Theory: I

2. Sessional Examinations: Theory: II

3. Summative Assessment

a. Theory:

Datta Meghe Institute of Medical Sciences (Deemed to be University)

Name of the Institute: SRMM College of Nursing

Name of Examination: Basic B.Sc. Nursing

Second Year: Genetics

PATH(II)210:IV/GEN:Primary2021 to 2025 batch

	Must to Know (MK)	Desirable to know (DK)	Nice to know (NK)	Marks = 12
LAQ				
SAQ (2) 1/2	(1) Level-I-1	(1) Level-I-1		5Mx1=5 M
Very short (3) 2/3	(2) Level-I-1 Level-II-1	(1) Level-I-1		2Mx2=4M
MCQ (5) 3/3	(3) Level-I-1 Level-II-1	(1) Level-I-1		1Mx3=3M
Total				**Total = 12 Marks**

LIST OF RECOMMENDED BOOKS:

- S. Mandal : Fundamentals of Human Genetics
- S. D. Gangane : Human Genetics
- Jordeycarey Roberts : An Introduction to Medical Genetics
- Elizabeth F. Lanzl : Medical Genetics
- J. Ben Hill, Helen Hill : Medical Genetics and Human Heredity
- Edmund W. Sinnott : Principles of Genetics
- P. C. Winter, G. I. Hickey : Instant Notes in Genetics
- Ching Chun L : Human Genetics – Principles and methods
- Mary B. Mahowald, et al : Genetics In Clinic
- Robert F. Muller et al :Emery's Elements of Medical Genetics
- Moore Keith L : Developing Human clinically Oriented Embryology
- Pansky Ban : Review of Medical Embryology
- Smell Richard S : Clinical Embryology for Medical Students
- Lnagman Jan : Medical Embryology