M.V.R. DEGREE COLLEGE
(UG And PG Courses)
(Affiliated to Andhra University)
An Institution of Priyadarshini Educational Academy
NAAC ACCREDITED COLLEGE

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Bachelor of Science
APSCHE, Revised Syllabus of Human Genetics under CBCS Framework w.e.f 2015(revised in April 2015)
Course Outcomes (Cos) for Human Genetics

Code	Title of the paper	Outcomes
Course 1 (TH)	Genetics and Human heredity	**CO1:** This course introduces the students to understand basics principals of genetics. Hence, the students get the knowledge about the fundamentals of heredity. **CO2:** The course introduce the students to understand about the pattern of inheritance resp. to sex **CO3:** The main objective of this course is to understand about mitochondrial inheritance and maternal inheritance in man . **CO4:** To understand the concept of mapping genes basing on linkage and crossing over. **CO5:** To understand structural and functional features of chromosome and also can understand the practical knowledge about karyotyping and related anomaliesbasing on structural and numerical aspect.
Course 1 (Pr)	Genetics and Human heredity	**CO1:**By practical experience students could understand the principles and fundamentals by calculating seed ratios on plants and studying mutants and model organisms. By using squash technique students can observe and know the stages of cell division They can know ABO and RH and also they

		can study the reasons of diseases by karyotyping.
Course 2 (TH)	Human genetics and Cytogenetics	**CO1:** Students can know the history of human genetics.They can understand about pedigree symbols and hence, they can design pedigree charts **CO2:** the main objective of this topic is to make students understand about quantitative genetics and its traits **CO3:** The main objective of this course is to make the students understand about mapping techniques on complex traits. **CO4:**Thiscourse introduces the concept of cell division, students should understand how chromosomes divide, **CO5:**recombinants formation during crossing over and about gametes formation.
Course 2 (Pr)	Human genetics and Cytogenetics	**CO1:** Students imparts to know that fundamental concepts like pedigree analysis and genetic counseling by studying genetic traits and diseases and also they can apply in family history and observe the severity of disease **CO2:**Students can apply quantitative genetics like polymorphism by studying certain traits like dermatoglyphics ,ABO blood grouping.
Course 3 (TH)	**Human Molecular genetics**	**CO1:** students get the knowledge about the structure of DNA,RNA and proteins **CO2:** The main objective of this course is to understand protein synthesis mechanism **CO3:** This course introduces the students to know about the concept of recombination, replication mechanism,. **CO4:**RNA and proteins structure

		identification **CO5:**Post translational modifications
Course 3 (Pr)	Human Molecular genetics	**CO1:** Students get the practical knowledge on hands on experience by doing biomolecules techniques and biophysical techniques.
Course 4 (TH)	r-dna technology and stem cell technology	**CO1**: The main objective of this course is to make the student understand about cloning. **CO2**:Students get the knowledge about the screening methods of diseased genes **CO3** : Students get the awareness about the applications of r-DNA technology **CO4** :Vectors in cloning **CO5:**Restriction enzymes and their applications
Course 4 (Pr)	r-dna technology and stem cell technology	**CO1:** By practical experience students could understand the technique of isolation of plasmid DNA, digestion and construction of restriction maps and PCR technique.
Course 5 (TH)	Statistics and information in human genetics	**CO1:** Students know the fundamental basics of statistics like by using data mean,median,mode,central tendency,measures of dispersion **CO2:** Students would understand how correlation,ANOVA, T-test shows its significance in sample and population based on expected and observational data. **CO3:** Students would understand bioinformatics and its relationship with IT **CO4:**Display knowledge of antigen, formation of antibodies, antigen

		antibody reaction. **CO5:**t-test shows its significance in sample and population based on expected and observational data.
Course 5 (Pr)	Statistics and information in human genetics	**CO1 :**By practical experience students could understand the sums related to probability, ANOVA and t-test.They learn about computer operation of searching similarity sequences in databanks.
Course 6 (TH)	Stem cell technology	**CO1:** The main objective of this course is to explore the importance of stem cells in our life **CO2**: Students understand anatomy and physiology of human body. **CO3**:The main objective of this course is to understand how the stem cells are differentiated into lineage specific tissues **CO4**:Students understand anatomy and physiology of human body. **CO5**:The main objective of this course is to explore the importance of stem cells in our life and also students grab the concepts of stem cells
Course 6 (Pr)	Stem cell technology	**CO1:** By practical experience students could understand the sums related to probability, ANOVA and t-test.They learn about computer operation of searching similarity sequences in databanks.
Course 6 (TH)Elective Paper-VII(A)	Basics of human biology	**CO1:** Students come to know classification ,man's place in animal kingdom,theories of classification. **CO2:**Students know polymorphism on estimation of blood groups

		CO3: Students get knowledge about what is mortality,genetic demography **CO4** Students understand about reproductive,urinary,endocrine,nervous. circulatory and skeletol system **CO5**Students learn about the anatomy and physiology of human body
Course 6 (Pr) Elective Paper-VII(A)	Basics of human biology	**CO1:** By practical experience students learn about the landmark of human skeletol structure, Anthropological measurements of bones,cranium and somatic parts of the body.
Course 6 (TH)Elective Paper-VII(B)	Human genome project and genome	**CO1:** Student understand how the genome get mapped by using genetic,physical and sequencing mapping. **CO2:**Students learn about sequencing method,microarrays,protein profiling **CO3:**Students learn about what is genome and what is human genome project and their contributions **CO4:** Students learn about construction of phylogenetic tree from ancesters **CO5:** ,physical mapping and sequencing
Course 6 (Pr)Elective Paper-VII(B)	Human genome project and genome	**CO1:** By practical experience students learn about the isolation of genomic DNA,they learn to access NCBI website and sequence alignment using BLAST and its types and construction of phylogenetic tree.
Course 6 (TH)Elective Paper-VII(C)	Biochemical Correlations in Diseases	**CO1:**It helps the student learn about the inborn errors of metabolism. **CO2:**Helps the student learn about the

		diseases caused due to hormonal imbalance, autoimmune diseases an infectious diseases. **CO3:**Gives awareness about distinguishing various types of diseases.
Course 6 (Pr)Elective Paper-VII(C)	Nucleic acid isolation and agarose gel electrophores	**CO1**: By practical experience students learn about types of PCR,blotting techniques,electrophoresis technique and primer designing
Course 6 (TH)Cluster PAPER VIIIA) Cluster 1-1	Molecular pathology in human disease	**CO1**:Students learn about Epidemiology and symptoms of disease caused by fungi,protozoa and about cancer genetics. **CO2**:Students can learn and recall the knowledge about electrophoresis,immunoblotting, sequencing ,PCR and hybridization techniques **CO3**:Students learn etiology and pathophysiology of different diseases. **CO4**: Students get the knowledge about various genetic testing techniques to diagnose hereditary diseases **CO5:** Students know about molecular diagnosis techniques to diagnose infectious diseases.
Course 6 (Pr)Cluster PAPER VIIIA Cluster 1-1	Molecular pathology in human disease	**CO1:**By practical experience students learn about types of PCR,blotting techniques,electrophoresis technique and primer designing
Course 6 (TH) Cluster PAPER IXA Cluster 1-2	Cytogenetics	**CO1:**Students recall chromosomal organization **CO2:**Students recall numerical,structural anomalies **CO3:**Students know about induced chromosomal anomaly,dosage

		compensation in the given modal organisms **CO4:**Students can recall the structure and function and types of various chromosomes **CO5:** Students can find the molecular and cytological mechanisms of cell division steps
Course 6 **(Pr) Cluster** **PAPER IXA** **Cluster 1-2**	Cytogenetics	**CO1:**Students learn about mitosis and meiosis process preparation and barr bodies identification
Course 6 **(TH) Cluster** **PAPER XA** **Cluster 1-3**	Genetics and society	**CO1:**Students learn about the basics of population genetics **CO2:** Students learn about prenatal diagnosis of genetic diseases screening methods. **CO3:**Students recall the Human genome project and find out their impact **CO4:**Students learn about ethical issues regarding screening,embryo research and gene therapy **CO5:**screening methods.
Course 6 **(Pr) Cluster** **PAPER XA** **Cluster 1-3**	Genetics and society	**CO1:**The main objective of this course is to make the students to study in brief about each and every genetic disease and apply on family pedigree who is having the history of genetic diseases,Dermatoglyphics and they study about mendelian traits.

Course 6 (TH) Cluster PAPER VIIIB Cluster 2-1	Molecular genetics	**CO1:**Students know about the viral and bacterial genome organization **CO2:**This course is introduced to understand replication in bacteria ,eukaryotic chromosomes and controlling genes **CO3:**This course involves the students to understand about post transcriptional modifications **CO4:**This topic makes students to get the knowledge about regulation of gene expression **CO5:** Students will learn the mechanism of steroids and gene expression
Course 6 (Pr) Cluster PAPER VIIIB Cluster 2-1	Molecular genetics	By practical experience students learn about isolation of DNA from peripheral blood,tissue,lymphocytes and quantification and quality check of genomic DNA.
Course 6 (TH) Cluster PAPER IXB Cluster 2-2	Human biochemical genetics	**CO1:**Students learn about polymorphism. **CO2:** Students learn about Haemoglobin its structure, synthesis and function. **CO3:** This topic tells about pharmacogenetics and deficiency enzymes **CO4:**Students learn about inborn errors of metabolism and its disorders **CO5:**This topic tells about pharmacogenetics and deficiency enzymes
Course 6 (Pr) Cluster PAPER IXB Cluster 2-2	Human biochemical genetics	**CO1:**By practical experience students learn about blood grouping, estiamation of Hb, chromatography techniques

Course 6 (TH) Cluster PAPER XB Cluster 2-3	Human population genetics	**CO1:**Students get the knowledge about hardy-weinberg equilibrium and this method can be applied on genes **CO2:**Students understand about population genetics and apply the principles on population **CO3:**Students find out the consequences of inbreeding effect **CO4:**Students find out the environmental effect on expression of genes **CO5:**Students get the knowledge on evolutionary insights
Course 6 (Pr) Cluster PAPER XB Cluster 2-3	Human population genetics	**CO1:**By practical experience students learn about Population genetics and identification of gene and genotype frequencies, PTC testing.
Course 6 (TH) Cluster PAPERVIIIC Cluster 3-1	Clinicalgenetics and genetic councelling	**CO1:**Students get the knowledge about different genetic disorders,disease related to inborn errors and genomic imprinting syndromes **CO2:**Students understand about genomic,neutrological,muscle genetic disorders **CO3:**Students learn about disorders caused due to defects in hb,disorders of eye,polygenic syndromes **CO:**Students learn about fundamentals of genetic counseling **CO4:**Students find out the importance of genetic counseling
Course 6 (Pr) Cluster PAPERVIIIC Cluster 3-1	Clinicalgenetics and genetic councelling	**CO1:**By practical experience students learn about preparation of metaphase chromosomes,banding techniques,genetic counseling and risk factors.

Course 6 (TH) Cluster PAPER IXC Cluster 3-2	Laboratory Diagnosis in Genetics	**CO1:**Students learn about different cell cultures and techniques. **CO2:**They identified disease by molecular technique. **CO3:**Students understandsds the culture techniques and chromosome analysis **CO4:**Learn about metabolic diseases **CO5:**Learn chromosomal analysis:
Course 6 (Pr) Cluster PAPER IXC Cluster 3-2	Laboratory Diagnosis in Genetics	**CO1:** They learn how to prepare metaphase chromosome. **CO2:** They learn different banding techniques. **CO3:**They learn about genetic counseling and risk factors.
Course 6 (TH) Cluster PAPER XC Cluster 3-3	Developmental and behavioral genetics	**CO1:** Students found importance of fertilization and imparts in model organelles **CO2:** Students grab developmental studies. **CO3:** Students identify molecular techniques for disease identification **CO4:** tudents get the knowledge about flower development **CO5:**Students found importance of fertilization and imparts in model organelles
Course 6 (Pr) Cluster PAPER XC Cluster 3-3	Developmental and behavioral genetics	**CO1:**By practical experience students learn about life cycle of chick embryo,drosophila

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