

M.V.R. DEGREE COLLEGE

(UG And PG Courses)

(Affiliated to Andhra University)

An Institution of Priyadarshini Educational Academy

NAAC ACCREDITED COLLEGE

Dr.V.Rama Rao, M.A.,Ph.D.,
Secretary & Correspondent

Dr.A.Balakrishna,M.Sc.,Ph.D.,
Principal

Department of Human Genetics

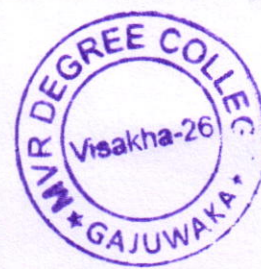
Bachelor of Science

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	<p>CO1: This course introduces the students to understand basics principals of genetics. Hence, the students get the knowledge about the fundamentals of heredity.</p> <p>CO2: The course introduce the students to understand about the pattern of inheritance resp. to sex</p> <p>CO3: The main objective of this course is to understand about mitochondrial inheritance and maternal inheritance in man .</p> <p>CO4: To understand the concept of mapping genes basing on linkage and crossing over.</p> <p>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.</p>
Course 1 (Pr)	Genetics and Human heredity	<p>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</p>



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

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		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



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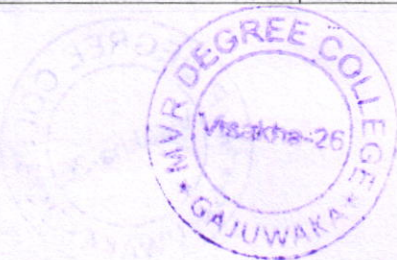
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		antibody reaction. CO5: t-test shows its significance in sample and population based on expected and observational data.
Course 5 (Pr)	Statistics and information in human genetics	CO1 : By practical experience students could understand the sums related 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



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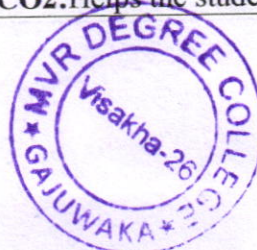
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		<p>CO3:Students get knowledge about what is mortality,genetic demography</p> <p>CO4 Students understand about reproductive,urinary,endocrine,nervous. circulatory and skeletol system</p> <p>CO5Students learn about the anatomy and physiology of human body</p>
Course 6 (Pr) Elective Paper-VII(A)	Basics of human biology	<p>CO1: By practical experience students learn about the landmark of human skeletol structure, Anthropological measurements of bones,cranium and somatic parts of the body.</p>
Course 6 (TH)Elective Paper-VII(B)	Human genome project and genome	<p>CO1: Student understand how the genome get mapped by using genetic,physical and sequencing mapping.</p> <p>CO2:Students learn about sequencing method,microarrays,protein profiling</p> <p>CO3:Students learn about what is genome and what is human genome project and their contributions</p> <p>CO4: Students learn about construction of phylogenetic tree from ancestors</p> <p>CO5: ,physical mapping and sequencing</p>
Course 6 (Pr)Elective Paper-VII(B)	Human genome project and genome	<p>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.</p>
Course 6 (TH)Elective Paper-VII(C)	Biochemical Correlations in Diseases	<p>CO1:It helps the student learn about the inborn errors of metabolism.</p> <p>CO2:Helps the student learn about the</p>



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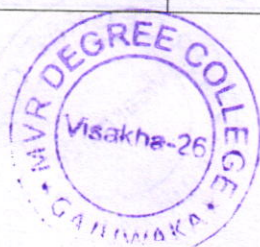
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		diseases caused due to hormonal imbalance, autoimmune diseases and infectious diseases. CO3: Gives awareness about distinguishing various types of diseases.
Course 6 (Pr)Elective Paper-VII(C)	Nucleic acid isolation and agarose gel electrophores	CO1: 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



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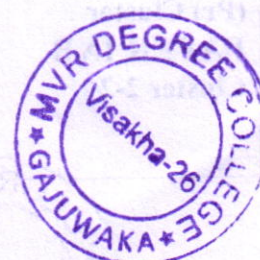
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		compensation in the given modal organisms CO4: Students can recall the structure and function and types of various chromosomes CO5: Students can find the molecular and cytological mechanisms of cell division steps
Course 6 (Pr) Cluster PAPER IXA 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.



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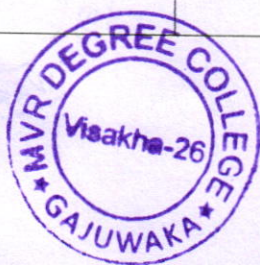
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Course 6 (TH) Cluster PAPER VIIIB Cluster 2-1	Molecular genetics	CO1:Students know about the viral and bacterial genome organization CO2:This course is introduced to understand replication in bacteria ,eukaryotic chromosomes and controlling genes CO3:This 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, estimation of Hb, chromatography techniques



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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 PAPER VIII C Cluster 3-1	Clinical genetics and genetic counselling	CO1: Students get the knowledge about different genetic disorders,disease related to inborn errors and genomic imprinting syndromes CO2: Students understand about genomic,neurological,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 PAPER VIII C Cluster 3-1	Clinical genetics and genetic counselling	CO1: By practical experience students learn about preparation of metaphase chromosomes,banding techniques,genetic counseling and risk factors.



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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 understands 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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Shramika Nagar, Gajuwaka,
VISAKHAPATNAM - 530 026