

Credit Based Programme for Postgraduate Syllabus:

M.Sc. /M.A. Semester III & IV (*Biological Anthropology*) (*Group – A*)



2019-21

ANTHROPOLOGY

**Doctor H.S. Gour Vishwavidyalaya, Sagar (M.P.)
(*A Central University*)**

SEMESTER – III
Group – ‘A’
(Biological Anthropology)

Paper Code	Name of the paper	Credits	Marks
ANT- CC- 321 ‘A’	: Human Genetics	4	100*
ANT- CC -322 ‘A’	: Practical in Osteometry & Dermatoglyphics	4	100*
ANT- CC -323 ‘A’	: Practical in Biochemical Genetics, Cytogenetics and Physiology	4	100*
<u>Select any two papers</u>			
ANT- EC- 321 ‘A’	: Applied Biological Anthropology	3	100*
ANT- EC- 322 ‘A’	Forensic Anthropology	3	100*
ANT- EC -323 ‘A’	: Ecological Anthropology	3	100*
ANT- EC -324 ‘A’	Medical Anthropology	3	100*
	ANT-OE-321 ‘A’		
	Medical Genetics	2	100*

***Total Marks 100: Mid Semester = 40 (1st mid 20+ continuous internal assessment 15+05*)**
End Semester = 60 *** Attendance**

Total Required Credits **20**

M.Sc./ M.A., Group 'A', SEMESTER – THIRD

Anthropology

L	T	P	C
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ANT - CC 321 'A'

Human Genetics

Maximum Marks : 100

Mid Semester = 40 (Ist mid 20+ continuous internal assessment 15+05*)

End Semester = 60 ***Attendance**

(Lectures)

Learning Outcomes :

The learning outcomes of this paper are:

1. The students will learn about genetics and the principles of human genetics.
2. They will learn about inheritance and the factors influencing inheritance.
3. They will also learn about the role of admixture in population structure.

Unit- I Concept and History of Genetics. Twin Studies, Pedigree Analysis, 12
Karyotyping, Biochemical Genetic, Cytogenetic and Human Genome.

Unit- II Concept of Gene and Its Expression, Structure and Function of D.N.A., 12
R.N.A., Replication, Transcription, Translocation, Genetic Code. Theories of Inheritance: Autosomal, Sex Linked, Multiple Allele: Compatible and Incompatible Mating. Types of Chromosomal Aberrations with Detailed Study of Following Syndrome: Patau's, Edward, Down, Klinefelter and Turner.

Unit-III Disease Implication of Serological Markers: Haemoglobines, Glucose 6 12
Phosphate Dehydrogenase, Haptoglobines, Transferrins, HLA System.

Unit-IV Inborn Errors of Metabolism: Phenylketoneuria, Alkaptonuria, 12
Galactosemia; Immunological Disorders: Structure and Types of Immunoglobulines. Autoimmune Diseases, Transfusion Reaction and Allergy. Genetic Engineering, Genetic Counseling, Gene Enzyme Hypothesis.

Unit-V Population Genetics: Definition, Concept And Scope; Hardy Weinberg 12
Law. Consanguineous Mating, Polymorphism.

Essential readings:

1. Bhamrah, H. S., & Chaturvedi, C. M. (2002). Textbook of Genetics. Anmol Publications PVT. LTD. New Delhi, India.
2. Vogel, F. & Motulsky, A.G. (1982). Human Genetics: Problem and Approaches. Springer-Verlag Berlin Heidelberg New York.
3. Levitan, M. & Montagu, A. (1977). Textbook of Human Genetics. Oxford University Press. New York.
4. Mange, E. J., & Mange, A. P. (1999). Basic Human Genetics. Sunderland, Mass: Sinauer Associates, Inc. Canada.
5. McKusick, V. A. (1972). Human Genetics. New Delhi: Prentice Hall of India.
6. Curt, S. (1973). Principles of Human Genetics. San Francisco, Calif: Freeman. California, USA.
7. Montagu, A. (1964). The Concept of Race. Collier-Macmillan, London, England.
8. Awasthi, A. (2013). Physical Anthropology and Human Genetics. New Delhi: Satyam Pub. House, India.
9. Bodmer, W. F. & Sforza, C. (1976). Genetics, Evolution and Man. San Francisco: W.H. Freeman, California, USA.
10. King, R.C., Stansfield, W. D. & Mulligan, P. K. (2014). A Dictionary of Genetics. Oxford Univ. London.
11. Burdette, W. J. (1962). Methodology in Human Genetics. W. J. Burdette (Ed.). Holden-Day. California, USA.
12. Yunis, J. J. (1969). Biochemical Methods in Red Cell Genetics. New York, Academic Press. USA.
13. Reddy, V. Rami (2012). Foundation of Physical Anthropology and Human Evolution. Indira Publication, Tirupati.
14. Reddy, V. Rami (2012) : Current Trends in Human Genetics and Physical Anthropology, Indira Publication, Tirupati.

Additional Readings:

1. Harris, H. (1966). Human Biochemical Genetics. Human Biochemical Genetics. Cambridge, University Press. England.
2. Winchester, A. M. (1966). Genetics; A Study of the Principles of Heredity. Boston, Houghton Mifflin, USA.
3. Harrison, G. A. (1988). Human Biology: An Introduction to Human Evolution, Variation and Growth. Oxford University Press, London.

M.Sc./ M.A., Group 'A', SEMESTER – THIRD

Anthropology
ANT - CC 322 'A'

L	T	P	C
-	-	9	4

Practical in Osteometry & Dermatoglyphics

Maximum Marks : 100

Mid Semester = 40 (1st mid 20+ continuous internal assessment 15+05*)

End Semester = 60

***Attendance**

Learning Outcomes

The learning outcomes of this paper are:

1. The students will learn about osteometry, dermatoglyphics and its scope along with applications.
2. They will learn about various classifications and types of fingerprints and palmprints.
3. From the practical component they will learn about recording, determining and comparing fingerprints.
4. From the practical component they will learn about how to measure and draw the various human bones for the purpose of the study of palaeoanthropology and biological variations.

● **OSTEOMETRY PRACTICAL : Measurements, Indices and Angles of Following Bones.**

12

1. Clavicle :

- a. **Linear Measurements:** (i) Maximum Length; (ii) Vertical Diameter in Middle; (iii) Sagittal Diameter in Middle; (iv) Girth in the Middle.
Indices : (i) Calibre Index; (ii) Cross-sectional Index.
- b. **Angles :** (i) Lateral Angle

2. Scapula :

- a. **Linear Measurements :** (i) Morphological Length; (ii) Morphological Breadth; (iii) Length of Spine; (iv) Length of Supra Spinous Line; (v) Length of Infra Spinous Line; (vi) Vertical Diameter of Glenoid Fossa; (vii) Transverse Diameter of Glenoid Fossa; (viii) Length of Auxiliary Border.
- b. **Indices :** (i) Scapular Index; (ii) Marginal Index.
- c. **Angles :** (i) Breadth – Length Angle; (ii) Infra-Spinous Angle; (iii) Supra-Spinous Angle; (iv) Axillo-Spinal Angle; (v) Vertebral Border Angle.

3. Humerus :

12

- a. **Linear Measurements :** (i) Maximum Length; (ii) Total Length of Humerous; (iii) Breadth of Proximal Epiphysis; (iv) Breadth of Distal Epiphysis; (v) Least Circumference of the Shaft; (vi) Transverse Diameter of the Head; (vii) Sagittal Diameter of the Head; (viii) Breadth of Trochlea.

- b. **Indices** : (i) Calibre Index; (ii) Trochlear Epicondylar Index.
- c. **Angles** : (i) Torsion Angle; (ii) Condylar-diaphysal Angle.

4. Radius :

- a. Linear Measurements : (i) Maximum Length; (ii) Physiological Length; (iii) Least Circumference of the Shaft; (iv) Transverse Diameter of the Shaft; (v) Sagittal Diameter of the Shaft.
- b. **Indices** : (i) Calibre Index; (ii) Cross-sectional Index.
- c. **Angles** : (i) Collo-Diaphysal Angle.

5. Ulna

12

- a. **Linear Measurements:** (i) Maximum Length; (ii) Physiological Length; (iii) Least Circumference of the Shaft; (iv) Maximum Breadth of the Olecranon; (v) Height of Olecranon Cap; (vi) Transverse Diameter; (vii) Dorso-Ventral Diameter.
- b. **Indices** : (i) Calibre Index; (ii) Olecranon-Cap Index.
- c. **Angles** : (i) Olecranon-Coronoid Angle; (ii) Joint Axis Angle.

6. Femur

- a. **Linear Measurements** : (i) Maximum Length; (ii) Physiological Length; (iii) Maximum Trochantric Length; (iv) Physiological Trochantric Length; (v) Sagittal Diameter of the Shaft; (vi) Transverse Diameter of the Shaft; (vii) Circumference in the Middle of the Shaft; (viii) Upper Sagittal Diameter of the Shaft; (ix) Upper Transverse Diameter of the Shaft; (x) Lower Sagittal Diameter of the Shaft;
- b. (xi) Lower Transverse Diameter of the Shaft.
- c. **Indices** : (i) Platymetric Index; (ii) Robusticity Index.
- d. **Angles** : (i) Torsion Angle; (ii) Collo-Diaphysal Angle.

7. Tibia :

12

- a. Linear Measurements : (i) Total Length of Tibia; (ii) Maximum Length;
- b. (iii) Physiological Length; (iv) Girth of Shaft; (v) Maximum Diameter in the Middle of the Bone; (vi) Transverse Diameter in the Middle of the Bone.
- c. **Indices** : (i) Cross-sectional Index in Middle; (ii) Length Thickness Index.
- d. **Angles** : (i) Inclination Angle; (ii) Retroversion Angle.

8. Fibula :

- a. Linear Measurements: (i) Maximum Length; (ii) Maximum Diameter in the Middle; (iii) Minimum Diameter in the Middle; (iv) Girth in Middle.
- b. **Indices** : (i) Cross-sectional Index in Middle; (ii) Calibre Index.
- c. **Angles** : (i) Distal Articular Surface-Shaft Angle; (ii) Proximal Articular Surface-Shaft Angle.

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- 9. **Dermatoglyphics:** Techniques of Taking Finger, Palm and Sole Prints; Finger: Identification of Whorls, Loops and Arches; Dankmeijer's Index; Furuhashi's Index; Ridge Counting, Absolute Finger Ridge Count (AFRC), Total Finger Ridge Count (TFRC)
Palm: Main Line Formulas; Axial Triadius; Angle Atd; Patterns on Interdigital Areas; A-B, B-C And C-D Ridge Counts. Calculations of the Following Indices: Pattern Intensity Indices; Main Line Index.
Palmer Crease: Analysis of Palmer Flexion Crease.

Essential Readings :

1. Cummins, H., & Midlo, C. (1961). Finger Prints, Palms and Soles: An Introduction to Dermatoglyphics. New York: Dover Publications. New York, US.
2. Miller, O. J., & Therman, E. (2001). Human Chromosomes. New York: Springer. New York, US.
3. Frazer, J. E. S., & Gray, J. E. (1946). The Anatomy of the Human Skeleton. London: J. & A. Churchill. London, UK.
4. Gray, H., Carter, H. V., & Davidson, G. (2015). Gray's Anatomy. London, UK.
5. Hamerton, J. L. (1971). Human Cytogenetics. New York: Academic Press. New York, US.
6. Hrdlic'ka, A. (1972). Practical Anthropometry. New York: AMS Press. New York, US.
7. Singh, I. P., & Bhasin, M. K. (1989): Anthropometry. Delhi: Kamla-Raj Enterprises. Delhi, India.
8. Singh, I. P. and M. K. Bhasin (2004): A Manual of Biological Anthropology, Kamla-Raj Enterprises, New Delhi.

Additional Readings:

1. Race, R. R., Sanger, R., & Fisher, R. (1962). Blood Groups in Man (Vol. 142). Oxford: Blackwell Scientific Publications. Egnland.
2. Weiner, J. S., Lourie, J. A. (1969). Human Biology, a Guide to Field Methods. London: International Biological Programme, London England.

M.Sc./ M.A., Group 'A', SEMESTER – THIRD
Anthropology

L	T	P	C
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ANT - CC 323 'A'
Practical in Biochemical Genetics, Cytogenetics and Physiology

Maximum Marks : 100

Mid Semester = 40 (Ist mid 20+ continuous internal assessment 15+05*)

End Semester = 60 ***Attendance**

Learning Outcomes :

The learning outcomes of this paper are:

1. The students will learn about the techniques of blood grouping, Haemoglobin level.
2. They will learn about identification of sickle cell haemoglobin .
3. They will also learn about the measuring of various physiological parameters.

Unit-I	<u>Serology</u> Blood Groups and Genetical Strains. Techniques of ABO Blood Groups with Subgroups, MN and Rh Blood Grouping,	12
Unit-II	<u>Calculation of Gene Frequencies</u> Calculation of the Relative Gene Frequencies (ABO, Rh, MN, PTC and Sickle cell). <u>Estimation of Haemoglobin</u> by Sahil's Technique (Haemometer).	12
Unit-III	<u>Biochemical Genetics</u> Techniques of Electrophoresis Using Cellulose Acetate (Cellogelstrip). Tests for Sickle Cell Disease: Na ₂ S ₂ O ₅ Slide and Sodiumdithionate, Turbidity test. Test for G6 PD Deficiency.	12
Unit-IV	<u>Cytogenetics</u> Identification of Sex Chromatin (Barr Bodies) and Leukocyte Drum Stick, Human Chromosomes Karyotypes from Photography of Normal and Abnormal Subjects.	12
Unit-V	<u>Physiology</u> Techniques of Measuring Vital Capacity, Body Temperature, Blood Pressure, Body Weight, Body Fat, Pulse Rate.	12

Note: Seminar Five Marks Should be Included in Paper C 329 'A'

Essential Readings:

1. Frazer, J. E. S., & Gray, J. E. (1946). *The Anatomy of the Human Skeleton*. London: J. & A. Churchill. London, UK.
2. Race, R. R., Sanger, R., & Fisher, R. (1962). *Blood Groups in Man* (Vol. 142). Oxford: Blackwell Scientific Publications. Oxford, England.
3. Cummins, H., & Midlo, C. (1961). *Finger Prints, Palms and Soles: An Introduction to Dermatoglyphics*. New York: Dover Publications. New York, US.
4. Miller, O. J., & Therman, E. (2001). *Human Chromosomes*. New York: Springer. New York, US.
5. Frazer, J. E. S., & Gray, J. E. (1946). *The Anatomy of the Human Skeleton*. London: J. & A. Churchill. London, UK.
6. Gray, H., Carter, H. V., & Davidson, G. (2015). *Gray's Anatomy*. London, UK.
7. Hrdlička, A. (1972). *Practical Anthropometry*. New York: AMS Press. New York, US.
8. Singh, I. P., & Bhasin, M. K. (1989). *Anthropometry*. Delhi: Kamla-Raj Enterprises. Delhi, India.

Additional Readings:

1. Weiner, J. S., Lourie, J. A. (1969). *Human Biology, a Guide to Field Methods*. London: International Biological Programme, London, England.
2. Hamerton, J. L. (1971). *Human Cytogenetics*. New York: Academic Press. New York, US.

M.Sc./ M.A., Group ‘A’, SEMESTER – THIRD
Anthropology

L	T	P	C
3	-	-	3

ANT - EC- 321 ‘A’
Applied Biological Anthropology

Maximum Marks : 100

Mid Semester = 40 (Ist mid 20+ continuous internal assessment 15+05*)

End Semester = 60

***Attendance**

Learning outcomes :

The learning outcomes of this paper are:

1. The student will learn applied aspect of biological anthropology.
2. They will learn cytogenetic techniques of prenatal diagnosis.
3. They will learn about ultrasonography techniques prenatal diagnosis.
4. They will learn about molecular techniques used for genetic investigation.
5. They will learn application of Anthropology in different industries.

(Lectures)

Unit- I	Meaning and Scope of: Applied Biological Anthropology/Physical Anthropology.	9
Unit- II	Cytogenetic Techniques: Application of Banding Techniques in the Identification of Structural Abnormalities, Prenatal Diagnosis, Amniocentesis. Chorionic Villi Sampling (CVS): meaning, structure and use of CVS. Fetoscopy : Meaning & scope of Fetoscopy.	9
Unit-III	Doppler, Ultrasonography: Ultrasound and Congenital Anomalies, Ultrasound & Markers. Detection of 5 Major Recognizable Malformations Through Ultrasound. Southern Blotting, Northern Blotting, Western Blotting, Polymerase Chain Reaction (PCR), DNA Finger Printing.	9
Unit-IV	Different Body Proportions: Ecological, Ethnic and Genetic Variation of Body Shape and Size in Relation to Sports Efficiency. Anthropometry in Context to Designing: Defense Equipment, Household Gadgets, Furniture and Readymade Garments.	9
Unit-V	Artificial Limbs and Footwear: Techniques and Measurements. Application of Anthropometry in Limbs and Footwear. Aerospace and Aviation. Application of: (i) Ergonomics (ii) Dynamic Measurement (iii) Technique of Measurements. Eugenics: History, Type and Application, Paternity Determination: Methods and Application.	9

Essential Readings :

1. Burdette, W. J. (1962). Methodology in Human Genetics. W. J. Burdette (Ed.). Holden-Day, California, USA.
2. Falkner, F. (1966). Human Development. Philadelphia and London: W.B. Saunders. UK.
3. Das, B. M. (2008). Outlines of Physical Anthropology. Kitab Mahal. Allahabad, India.
4. Harris, H., & Hopkinson, D. A. (1976). Handbook of Enzyme Electrophoresis in Human Genetics. Amsterdam [u.a.], North-Holland.
5. Levitan, M., & Montagu, A. (1988). Textbook of Human Genetics (Vol. 21). New York: Oxford University Press, US.
6. Singh, I. P., & Bhasin, M. K. (1989). Anthropometry. Delhi: Kamla-Raj Enterprises, India.
7. Reddy, B. R. (2012) Current Trends in Human Genetics and Physical Anthropology, Tirupati, V. Indra.
8. Kreuzer helen (2008) Microbiology and Biotechnology A Guide for Student. III ed: Washington DC ASM, Press.
9. Harrison, G. A. (2004) Human Biology: An Introduction Human Evolution Variation and Adaptability, New York Oxford University Press.
10. Reddy, B. R. (2012) Foundations of Physical Anthropology and Human Evolution, Tirupati, V. Indra.
11. Harrison, G.A., J.S. Weiner, J. M. Tanner and N. A. Barnicot (1983): Human Bilology : An Introduction to Human Evolution, Variation, Growth and Ecology, Oxford University Press.

Additional Readings

1. Brock, D. J., & Mayo, O. (1978). The Biochemical Genetics of Man/Edited by DJH Brock, O. Mayo, New York: Academic Press, US.
2. Sodhi, H. S. (1991). Sports Anthropometry: A Kinanthropometric Approach. Mohali: Anova Publications, Punjab.
3. Yunis, J. J., & Aebi, H. (1969). Biochemical Methods in Red Cell Genetics. New York: Academic Press. US.

Anthropology
ANT - EC 322 'A'

L	T	P	C
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Forensic Anthropology

Maximum Marks : 100

Mid Semester = 40 (Ist mid 20+ continuous internal assessment 15+05*)

End Semester = 60

***Attendance**

Learning Outcomes :

The learning outcomes of this paper are:

1. The students will learn about the aims and scope of forensic anthropology.
2. They will learn about identification of skeletal and non-skeletal human remains.
3. They will also learn about various methods of identifying living persons.
4. From the practical component they will learn about identification of individuals on the basis of bones, blood, urine, semen, saliva, fingerprint and handwriting.

Unit- I	Definition, Scope and Schools of Forensic Anthropology. Study of Skeletal Material: Human and Animal Remains. The Study of Bone Fragments. Attribution of Sex, Estimation of Age and Reconstruction of Stature from the Skeletal Remains, and Their Medico-Legal Implications.	9
Unit- II	Forensic Odontology: Tooth Structure and Growth, Estimation of Age in Young and Adults. Population Differences in Size and Morphology. Bite Marks. Individualization of Tooth Pulp. Establishment of Partial and Complete Identity of Skeletal Material and Dead Bodies –Morphometric Techniques.	9
Unit- III	Personal Identification of Living Persons- Identification through Somatometric and Somatoscopic Observations, Nails, Occupation Marks, Scars, Tattoo Marks and Deformities; Handwriting and Mannerisms. Finger Prints: Identification of Living and Dead Through Partial and Complete Prints. Classification of Fingerprints for Criminal Record Purposes. Chance Prints. Various Methods of Latent Print Development.	9
Unit- IV	Forensic Haemogenetics: Pattern of Blood Splashes, Identification of Bloodstains and Determination of Species of Origin. Individualization of Blood Stains: Determination of Blood Group, Sex, Age and Racial Origin from Dried Bloodstains.	9

Essential Readings:

1. Boorman, K. E., Dodd, B. E., & Lincoln, P. J. (1981). Blood Group Serology: Theory, Techniques, Practical Applications. Edinburgh: Churchill Livingstone. London.
2. Bridges, B. C., & O'Hara, C. E. (1963). Practical Fingerprinting. New York: Funk and Wagnalls, US
3. Weihs, F. J. (1964). Science Against Crime. New York: Collier Books. US.
4. Hillson, S. (2013). Dental Anthropology. Milton Keynes UK: Lightning Source UK.
5. Gabbay, E. (1998). Crime Investigation. London: E. & J. Gabbay. England.
6. Symons, J. (1966). Crime and Detection: An Illustrated History From. London: Studio Vista. England.

Additional Readings:

1. Cherrill, F. R. (1954). The Fingerprint System At Scotland Yard: A Practical Treatise On Fingerprint Identification For The Use Of Students And Experts And A Guide For The Use Of Investigators When Dealing With Imprints Left At The Scenes Of Crime. London, England.
2. Simpson, K., & Mant, A. K. (1953). Modern Trends in Forensic Medicine. London: Butterworth, England.

M.Sc./ M.A., Group 'A', SEMESTER – THIRD

Anthropology ANT - EC 323 'A'

L	T	P	C
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Ecological Anthropology

Maximum Marks : 100

Mid Semester = 40 (Ist mid 20+ continuous internal assessment 15+05*)

End Semester = 60

***Attendance**

Learning Outcomes :

The learning outcomes of this paper are:

1. The students will learn about biological aspects of ecology and adaptation.
2. They will learn about cultural aspects of ecology and adaptation.
3. They will also learn about the relationship between ecology and state formation.
4. From the practical component they will learn about measurement of various parts of the human body and about preparing a research design on study of any environmental problem.

(Lectures)

- Unit – I** Ecological Anthropology: Definition and Approach, Aims and Objectives; The Distinctive Inter-disciplinary Nature of Ecological Anthropology, A Critique of Cultural Determination and Environmental Determinism. 9
- Unit – II** Ecological Approach as a Reaction to the Theory of Unilinear Evolution and as a Proponent of the School of Multilinear Evolution, Ecological Approach as a Reaction to the Concept of Culture as an Abstract 'Super Organic' Level : Revival of Cultural Materialism and Emergence of System Approach 9
- Unit – III** Ecology and Ecosystem : Ecology as a Natural Science – Concepts of Ecosystems, Eco-Niche, Ecological Community, Energy Pyramid, Ecological Hierarchy, Competition for Resources, Territorialism. Adaptation and Adaptive Specialization, Feedback and Carrying Capacity. 9
- Unit – IV** Major Branches of Ecological Anthropology: Population Ecology, Systems Ecology, Ethnoecology, Socio-Biology, Archaeological Ecology, Human Energetics. 9
- Unit – V** Cultural Ecology: Inadequacy of Original Definitions of Ecology and Ecosystems when Applied to Human Society and Culture, Anthropological Reinterpretation of Ecology, Ecosystem and Other Related Concepts. 9

Essential Readings:

1. Schutkowski, H. (2006). *Human Ecology: Biocultural Adaptations in Human Communities* (Vol. 182). Springer Science & Business Media.
2. Berry, J. W. (1976). *Human Ecology and Cognitive Style: Comparative Studies in Cultural and Psychological Adaptation*. New York: Sage Publications.
3. Theodorson, G. A. (1961). *Studies in Human Ecology*. Peterson & Company Elmsford, New York.
4. Ehrlich, P. R., Ehrlich, A. H., & Holdren, J. P. (1973). *Human ecology: problems and solutions*. WH Freeman.
5. Cohen, Y. A. (Ed.). (1968). *Man in Adaptation: The Cultural Present* (Vol. 2). Transaction Publishers.
6. Redfield, R. (1956). *Peasant Society and Culture: An Anthropological Approach to Civilization*.
7. Lee, R. B., & DeVore, I. (Eds.). (1968). *Man the Hunter*. Transaction Publishers.
8. Bennett, J. (1976). *The Ecological Transition: Cultural Anthropology and Human Adaptation*. Pergamon Press. New York.
9. Chapple, E. D. (1980). *The Biological Foundations of Individuality and Culture*. Huntington, Krieger Pub. Co. New York, US.
10. Eidt, R. C., Singh, K. N., Singh, R. L., & Singh, R. P. (1977). *Man, Culture, and Settlement: A Festschrift Presented to Prof. RL Singh*. New Delhi: Kalyani Publishers. New Delhi, India.
11. Hardesty, D. L., & Hardesty, D. L. (1977). *Ecological Anthropology*. New York: J. Wiley. New York, US.
12. Moran, E. F. (2009). *Human Adaptability: An Introduction to Ecological Anthropology*. Westview Press. USA.
13. Netting, R. M. (1971). *The Ecological Approach in Cultural Study* (No. 6). Addison-Wesley, Australian.
14. Steward, J. H. (1972). *Theory of Culture Change: The Methodology of Multilinear Evolution*. University of Illinois Press. Chicago, USA.
15. Tax, S., & Freeman, L. G. (1977). *Horizons of Anthropology*. Chicago: Aldine Pub. Co. Chicago, USA.
16. Tiwari, P. D., & Sharma, A. N. (1989). *Tribal Ecosystem and Malnutrition in India: (Proceedings of the National Seminar)*. New Delhi: Northern Book Centre. New Delhi, India.

Additional Reading

1. Bingham, W., & Wittfogel, K. A. (1958). *Oriental Despotism: A Comparative Study of Total Power*. New Haven: Yale University Press.
2. Frisancho, A. R. (1993). *Human Adaptation and Accommodation*. University of Michigan Press, USA.
3. Odum, H. T. (1971). *Environment, Power and Society*. Wiley-Interscience: New York, USA.
4. Reddy, G. P. (1982). *Scarcity and Survival: A Study in Culture Ecology of Chowra Island in Nicobar Archipelago*. Delhi: D.K. Publications. New Delhi, India.
5. Ucko, P. J., & Dimbleby, G. W. (Eds.). (2007). *The Domestication and Exploitation of Plants and Animals*. Transaction Publishers: London, UK

M.Sc./ M.A., Group ‘A’, SEMESTER – THIRD
Anthropology

L	T	P	C
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ANT - EC 324 ‘A’
Medical Anthropology

Maximum Marks : 100

Mid Semester = 40 (Ist mid 20+ continuous internal assessment 15+05*)

End Semester = 60

***Attendance**

Learning Outcomes :

The learning outcomes of this paper are:

1. The students will learn about basic concepts about health, sickness and disease from anthropological perspectives.
2. They will learn about various ethnomedical practices in India.
3. They will also learn about medical pluralism in India.
4. From the practical component they will learn about collection of data and writing of report on how people respond to sickness or ill-health.

Unit-I	Medical Anthropology: Meaning, Scope and Relevance. Concepts of Health, Disease, Sickness and Illness, Critical Medical Anthropology, Illness or Etiological Ideology, Concept of Culture and Lifestyle in Relation to Health and Disease.	9
Unit-II	Ethno-Medicine, Indigenous Medical Systems, Biomedical Systems, Medical Pluralism, Alternative and Complementary Medicines and Medical Practitioners or Healers.	9
Unit-III	Epidemiology: Basic Principles, Epidemiology of Communicable and Non-communicable Diseases, Occupational and Life-Style Diseases. Health Issues on RCH, Ageing, Disability, Genetic and Gender Specific Diseases.	9
Unit-IV	Promotion and Health Programmes in India and Among Tribal Communities. Family Welfare, Health Education. Health Care Delivery in India, Role of WHO, UNICEF etc. Critical Assessment of National Health Policy.	9
Unit-V	Research Methods in Medical Anthropology: Rapid Assessment Procedure (RAP), Free Listing, Pile Sorting, Projective Techniques and Focus Group Discussions, Genograms, Sociograms, KAP.	9

Essential Readings :

1. Banerjee, B. G., & Jalota, R. (1988). *Folk Illness and Ethnomedicine*. Northern Book Centre. New Delhi, India.
2. Caudill, W. (1953). *Applied Anthropology in Medicine*. S.I.: Univ. of Chicago Press: Chicago, USA.
3. Foster, G. M., & Anderson, B. G. (1978). *Medical Anthropology*. John Wiley & Sons, Inc. 605 3rd Avenue. New York, USA.
4. Hasan, K. A. (1967). *The Cultural Frontier of Health in Village India: Case Study of a North Indian Village*. Bombay: Manaktalas. Bombay, India.
5. Kakar, D. N. (1984). *Folk and Modern Medicine: (A North Indian Case Study)*. Nai Sarak, Delhi: New Asian Publishers. Delhi, India.
6. Landy, D. (1978). *Culture, Disease, and Healing: Studies in Medical Anthropology*. London: Collier Macmillan. London, UK.
7. Leslie, C. M. (1998). *Asian Medical Systems: A Comparative Study*. Delhi: Motilal Banarsidass Publishers. Delhi, India.
8. Loudon, J. B. (1976). *Social Anthropology and Medicine*. Academic Press Inc. (London) Ltd., 24-28 Oval Road, London, UK.
9. Paul, B. D. (1955). *Health, Culture, and Community*. Russell Sage Foundation. New York.
10. Read, M. (1966). *Culture, Health and Disease: Social and Cultural Influence on Health Programmes in Developing Countries*. Tavistock Publications. New York, US.
11. World Health Organization. (1995). *The World Health Report*. Geneva: WHO. Geneva, Switzerland.
12. Jejeebhoy, S. J. (1995). *Women's Education, Autonomy, and Reproductive Behaviour: Experience from Developing Countries*. Oxford: Clarendon Press. Oxford, UK.

Additional Reading

1. Bannerman, R. H. (1988). *Traditional Medicine and Health Care Coverage: A Reader for Health Administrators and Practitioners*. Geneva: World Health Organisation. Geneva, Switzerland.
2. Madan, T. N. (1980). *Doctors and Society: Three Asian Case Studies: India, Malaysia, Sri Lanka*. Sahibabad, Distt. Ghaziabad: Vikas. India.
3. Mead, M., & Federation, T. W. (1953). *Cultural Patterns and Technical Change*. Paris, UK.
4. India. (1983). *National Health Policy*. New Delhi: Ministry of Health & Family Welfare. New Delhi, India.
5. Rivers, W. H. R. (1999). *Medicine, Magic and Religion: The Fitzpatrick Lectures Delivered Before the Royal College of Physicians in London in 1915-1916*. Routledge. London, UK.

M.Sc./ M.A., Group ‘A’, SEMESTER – THIRD
Anthropology

L	T	P	C
2	-	-	2

ANT - OE-321 ‘A’
Medical Genetics

Maximum Marks : 100

Mid Semester = 40 (1st mid 20+ continuous internal assessment 15+05*)

End Semester = 60

***Attendance**

Learning Outcomes

The learning outcomes of this paper are:

1. The students will learn about medical genetics and its application.
2. They will learn about inheritance and the factors influencing inheritance.
3. They will also learn about genetic counseling and method of genetic investigation.
4. From the practical component they will learn about preventive and promoting health care practice.

Unit-I	Medical Genetics Via-A-Vis Medical Sciences and Genetics; Anthropology and Genetics, Anthropology and Medicine (Diseases)	6
Unit- II	Methods in Identification of Genetic Diseases: Pedigree Method, Twin Method, Cytogenetic Method, Biochemical Method, Prenatal Diagnosis, Genetic Counseling.	6
Unit- III	Ethno-Medical Aspect of Diagnosis : Control and Treatment	6
Unit- IV	Overlapping Areas and Their Relevance; Formal Genetics and Medical Genetics: To be Distinguished and Their Boundaries Identified. Timing and Possible Causation of Genetic Diseases / Syndrome / Defect / Disorder.	6
Unit- V	Congenital Deformities Having Adverse Bearing on Community Level. Genetic Epidemiology Society and Genetic Diseases: KAP and Curing Practices.	6

Essential Readings:

1. Connor, J. M., & Ferguson-Smith, M. A. (1995). *Essential Medical Genetics*. Oxford: Blackwell, UK..
2. Emery, A. E. H. (1971). *Elements of Medical Genetics ...Second Edition*. London, Edinburgh: E. & S. Livingstone. England.
3. Butani, S., Kourilsky, P., & Nath, I. (1987). *Genetics, Thread of Life*. New Delhi: Wiley Eastern, India.
4. Landy, D. (1978). *Culture, Disease, and Healing: Studies in Medical Anthropology*. New York, Macmillan; Collier Macmillan. US.
5. McKusick, V. A., Chase, G. A., & McKusick, V. A. (1972). *Study Guide: Human Genetics*. Englewood Cliffs, N.J: Prentice-Hall.
6. Read, A. P., Donnai, D., Middleton-Price, H., (2013). *Genetics in Medicine*. Galton Institute: London, England.

Additional Readings:

1. Morton, N. E. (1981). *Outline of Genetic Epidemiology*. Basel: Karger. New York, US.

Credit Based Programme for Postgraduate Syllabus:

M.Sc. /M.A. Semester IV (*Biological Anthropology*) (*Group – A*)



2019-21

ANTHROPOLOGY

**Doctor H.S. Gour Vishwavidyalaya, Sagar (M.P.)
(*A Central University*)**

SEMESTER – IV
Group – ‘A’
(Biological Anthropology)

Paper Code	Name of the Paper	Credits	Marks
ANT- CC 421 ‘A’	Human Growth and Nutrition	4	100*
ANT- CC- 422 ‘A’	Dissertation	6	100*
Select Any Three Papers			
ANT- EC-421 ‘A’	Anthropological Demography	3	100*
ANT- EC-422 ‘A’	Ethno-Medicine	3	100*
ANT- EC- 423 ‘A’	Physiological Anthropology	3	100*
ANT- EC- 424 ‘A’	Human Cytogenetic	3	100*

***Total Marks 100: Mid Semester = 40 (Ist mid 20+ continuous internal assessment 15+05*)**
End Semester = 60 *** Attendance**

Total Required Credit **19**

M.Sc./ M.A., Group ‘A’, SEMESTER – Fourth
Anthropology

L	T	P	C
4	-	-	4

ANT - CC- 421 ‘A’
Human Growth and Nutrition

Maximum Marks : 100

Mid Semester = 40 (Ist mid 20+ continuous internal assessment 15+05*)

End Semester = 60

***Attendance**

Learning Outcomes :

The learning outcomes of this paper are:

1. The students will learn about the concepts and indicators of human growth and development.
2. They will learn about pre-natal and post-natal growth.
3. They will also learn about various bio-cultural factors that influence growth.
4. From the practical component they will learn about how to assess growth, obesity and nutritional status.

Unit-I:	Definition and Concepts of Growth, Differentiation, Maturation and Development. Evolution of Human Growth: Human Lifespan Development Process, Human Life Cycle. Major Stages of Human Growth and Development - Prenatal Growth, Postnatal Growth and Their Characteristics	12
Unit-II:	Factors Affecting Growth: Genetic and Environmental: Secular Trends, Adaptation of Growth Rates to Environmental Stresses. Methods of Studying Human Growth.	12
Unit-III:	Measurement and Assessment of Human Growth: Changing Human Growth Patterns, Human Growth Curves of Different Body Parts and Tissues, Catch-Up Growth, Maturation, Growth References and Standards. Abnormal Growth.	12
Unit-IV:	Significance of age in Growth Studies: Methods of Assessing Age- Chronological Age, Dental Age, Skeletal Age, Secondary Sex Character Age, Morphological Age, Age-Grouping. Body Composition: Methods of Study, Changes During Growth, Variation and Covariates.	12
Unit-V:	Nutritional Status: Assessment and Methods of Evaluation. Concept of Balanced Diet. Nutritional Epidemiology, Impact of Malnutrition Under-Nutrition and Over-Nutrition.	12

Essential Readings:

1. Garn, S. M., & Shamir, Z. (1958). Methods for Research in Human Growth. Springfield: S.N. US.
2. Jelliffe, D. B., Jelliffe, E. F. P., Zervas, A., & Neumann, C. G. N. (1989). Community Nutritional Assessment: With Special Reference to Less Technically Developed Countries. Oxford: Oxford University Press, UK.
3. Ghosh, S. (2004). Nutrition and Child Care: A Practical Guide. New Delhi, India: Jaypee Brothers Medical Publishers.
4. Tanner, J. M. (1990). Fetus into Man: Physical Growth from Conception to Maturity. Cambridge, Massachusetts: Harvard University Press, USA.
5. Tanner, J. M. (1978). Growth at Adolescence. Oxford: Blackwell Scientific Publications. London.
6. Lee, C. M. (1991). The Growth and Development of Children. London: Longman, England.
7. Hulse, F. S., Weiner, J. S., & Lourie, J. A. (1970). Human Biology. A Guide to Field Methods. IBP Handbook number 9.
8. Weiner, J. S., Lourie, J. A., (1969). Human Biology, a Guide to Field Methods. International Biological Programme: London, England.
9. Cameron, N., & Bogin, B. (2012). Human Growth and Development. Academic Press.
10. Bogin, B. (1999). Patterns of Human Growth (Vol. 23). Cambridge University Press.
11. Johnson, F.E., Roche, A.F. & Susanne, C. (1980). Proceeding on Human Physical Growth and Maturation. Plenum Publishing Corporation.

Additional Readings:

1. Malina, R. M., Bouchard, C., & Bar-Or, O. (2004). Growth, Maturation and Physical Activity. Human Kinetics.
2. Heyward, V. H., & Wagner, D. R. (2004). Applied Body Composition Assessment (No. Ed. 2). Human Kinetics.
3. Harrison, G.A., Tanner, J.M., Pilbeam, D.R., & Baker, P.T. (2004). Human Biology: An Introduction to Human Evolution Variation Growth and Adaptability (3rd Edition). Oxford, New York: Oxford University Press.

M.Sc./ M.A., Group ‘A’, SEMESTER – FORTH
Anthropology

L	T	P	C
-	-	18	6

ANT - CC 422 ‘A’
Dissertation

Learning Outcomes :

The learning outcomes of this paper are:

1. The students will learn about how to do fieldwork.
2. They will learn about use of various techniques of data collection.
3. They will learn about classification, interpretation and presentation of data.
4. They will also learn about writing a dissertation, selecting chapter headings and subheadings, writing references, footnotes, endnotes, etc.

The Dissertation Will be Based on the Field Work Done Under the Guidance of Faculty Member. It Should be Imparted Outside Sagar District and Shall be of a Duration Not More Than One Month (Approximately) and Not Less Than 21 Days. The Students Shall be Required to Submit 2 Copies of Typed / Hand Written Record. It Will be Valued After Open Presentation by the Student As Well As Per University Academic Ordinance 22 ‘A’. The Distribution of Marks for the Valuation of Dissertation Will be As Follows:

Open Presentation	20 Marks
Concise Dissertation	60 Marks
Viva-Voce	20 Marks
Total	100 Marks

M.Sc./ M.A., Group ‘A’, SEMESTER – FORTH

Anthropology

L	T	P	C
3	-	-	3

ANT - EC- 421 ‘A’
Anthropological Demography

Maximum Marks : 100

Mid Semester = 40 (1st mid 20+ continuous internal assessment 15+05*)

End Semester = 60

***Attendance**

Learning Outcomes :

The learning outcomes of this paper are:

1. The students will learn about anthropological demography and its importance in human welfare.
2. They will learn about major population theories.
3. They will also learn about the various sources of data in population studies.
4. From the practical component they will learn about how to collect demographic data from various sources and prepare a project report on the same.

Lectures

Unit-I :	Definition and Concept of Anthropological Demography. Basic Demographic Variables: Age, Sex, Marriage, Sex Ratio, Fertility, Migration, Mortality, Morbidity and Population Growth.	9
Unit-II :	Factors Affecting Demographic Variables: Physical, Environmental, Biological, Socio-Cultural.	9
Unit-III :	Population Growth Theories : Pre-Malthusian Theory, Malthus Theory, Theory of Optimum Population, Biological Theories-Michael Thomas Sadler's Theory, Doubleday's Diet Theory, Pearl and Reed's Logistic Curve Theory, Corrado Gini's Theory, Herbert Spencer's, Castro's Theory of Protein Consumption, Theory of Demographic Transition.	9
Unit-IV :	Factors Regulating Population Growth; Fertility Rate, Birth Rate, Age-specific Fertility Rates, Net Reproductive Rate, Mortality Rate, Prenatal and Postnatal Life Table, Migration Rates, Intrinsic Rate of Natural Increase, Effective Population Size.	9
Unit-V :	Demography and Human Adaptation, Concept of Environment, Ecology and Functional Adaptation of Human Populations.	9

Essential Readings:

1. Barclay, G. W. (1975). *Techniques of Population Analysis*. New York u.a: Wiley. New York. US.
2. Bhende, A., & Kanitkar, T. (1978). *Principles of Population Studies*. Himalaya Publishing House. Bombay. India.
3. Cavalli-Sforza, L. L., & Bodmer, W. F. (1999). *The Genetics of Human Populations*. Courier Corporation. US.
4. Burdette, W. J. (1962). *Methodology in Human Genetics*. W. J. Burdette (Ed.). Holden-Day. San Francisco. Australia.
5. Cox, P. R. (2009). *Demography*. Cambridge, GBR: Cambridge University Press. London. UK.
6. Crow, J. F., & Kimura, M. (1970). *An Introduction to Population Genetics Theory*. An Introduction to Population Genetics Theory. New York. US.
7. Li, C. C. (1961). *Human Genetics: Principles and Methods*. New York: McGraw-Hill. New York. US.
8. Mamoria, C. B. (1958). *Tribal Demography in India*. Allahabad: Kitab Mahal. UP. India.
9. Mange, E. J., & Mange, A. P. (1999). *Basic Human Genetics*. Sunderland, Mass: Sinauer Associates, Inc. Foresterhill, Aberdeen. UK.
10. Pathak, K. B., & Ram, F. (1992). *Techniques of Demographic Analysis*. Himalaya Publishing House. Bombay. India.
11. Spiegelman, M. (1968). *Introduction to Demography*. Published by Harvard University Press. UK.
12. Wright, S. (1977). *Evolution and the Genetics of Populations*. University of Chicago Press. Chicago. US.

Additional Reading

1. Vogel, F., Motulsky III, A. G., & Brock, D. (1997). *Human Genetics: Problems and Approaches*. *Genetical Research*, 69(1), 75. London. UK.
2. Weiss, K. M., & Ballonoff, P. A. (Eds.). (1975). *Demographic Genetics*. Dowden Hutchinson and Ross. New York. US.
3. Malhotra, K. C. (1988). *Statistical Methods in Human Population Genetics*. Calcutta: Indian Institute of Bio-Social Research and Development. Calcutta. India.

M.Sc./ M.A., Group 'A', SEMESTER – FORTH

Anthropology

L	T	P	C
3	-	-	3

ANT - EC- 422 'A'

Ethno-medicine

Maximum Marks : 100

Mid Semester = 40 (Ist mid 20+ continuous internal assessment 15+05*)

End Semester = 60

***Attendance**

Learning Outcomes :

The learning outcomes of this paper are:

1. The students will learn about the relationship between anthropology and ethno-medicine.
2. They will learn about ethno-medicine with respect to health care practices and importance traditional healers.
3. They will also learn about variation in healthcare systems in India.
4. From the practical component they will learn about how to make need based area and group specific health care delivery model.

Unit – I	Definition and Concept of Ethno-Medicine: Definition of Disease, Illness, Health and Sickness. Natural and Supernatural Pathogenic Agents. Illness or Etiological Ideology.	9
Unit - II	People's Perception of Ethno Physiology and Ethno Anatomy. Ethno-Nutritional Concepts in Relation to Preventive, Primitive and Curative Health and Morbidity.	9
Unit – III	Perception of Body Image, Including Body Constitution, Composition, Elements That Contribute to the Survival of Body and Soul. Human Body As a Natural, Social, Cosmological, Political and Spiritual Symbol in the Context of Ritual Healing. Mother and Child Health Care Beliefs and Practices.	9
Unit – IV	Nature and Role of Traditional Medical Practitioners: Different Type of Ethnomedical Specialists, Their Stats and Medical Functions, Apprenticeship Pattern, Medical Knowledge of Practitioners, Animal Derivatives Administered for Various Disease, Medicines Extracted From Minerals, Other Therapies Employed.	9
Unit – V	Healing Rituals: Rituals of Inviting Healing Force for Diagnosis and Treatment, Collecting, Preparing and Administering Medicines. Therapeutic Rituals: Rituals of Appeasing Sprits, Rituals of Compromise, Rituals of Warding Off Pathogenic Agents/ Evil Effect, Rituals of Killing Pathogenic Agents, Rituals of Purification, Rituals of Prevention, Thanks Giving Rituals.	9

Essential Readings:

1. Caudill, W. (1953). *Applied Anthropology in Medicine*. Chicago: University of Chicago Press.
2. Foster, G. M. (1983). *An Introduction to Ethnomedicine*.
3. Kurian, J. C., & Tribhuvan, R. D. (1990). Traditional Medical Practitioners of the Sahyadri. *Eastern Anthropologist*, 43(3), 251-258.
4. Turner, V. W. (1967). *The Forest of Symbols: Aspects of Ndembu Ritual* (Vol. 101). Cornell University Press.
5. Iwu, M. M. (1982). *Perspectives of Igbo Tribal Ethnomedicine*. Cecta, Enugu, 4-5.

Additional Readings:

1. Hughes, C. C. (1968). Ethnomedicine: In *International Encyclopedia of the Social Sciences* 10: 87-93.
2. Kakar, D. N. (1977). *Folk and Modern Medicine*.

M.Sc./ M.A., Group 'A', SEMESTER – FORTH

Anthropology

L	T	P	C
3	-	-	3

ANT - E 423 'A'

Physiological Anthropology

Maximum Marks : 100

Mid Semester = 40 (1st mid 20+ continuous internal assessment 15+05*)

End Semester = 60

***Attendance**

Learning Outcomes :

The learning outcomes of this paper are:

1. The students will learn about the fundamentals of human physiology.
2. They will learn about physiological acclimatization to various environmental stresses.
3. They will also learn about the influence of factors like smoking, drinking and pollution on physiological performance.
4. They will learn about and its determinants along with aging and fitness.

Unit - I	Fundamentals of Human Physiology: Cardio-vascular and Respiratory Endurance, Haemodynamics and Exercise (Blood Pressure, Pulse Rate, Heart Rate And Oxygen- Transporting System, Blood Flow, Hb, Heamatocrit etc.) Physical Working Capacity and Physical Fitness Methodology: Evaluation of Response and Adaptation of the Body to Stress of Exercise.	9
Unit - II	Variations in Respiratory Functions with Age, Sex and Environment; Interrelationship of Body Measurements with Respiratory Functions. Impact of Smoking, Alcohol, Air Pollution and Occupation On Cardio-Respiratory Functions.	9
Unit - III	Regulation of Body Weight: Energy Expenditure and Physical Activity. Body Composition: Methods of Assessment, Environmental and Genetic Contribution to Obesity, Treatment and Prevention and Management. Obesity and Ethnicity.	9
Unit - IV	Physical Performance and Environmental Stress: Heat Stress, Cold Stress and High Altitude, Chronic Diseases, Malnutrition.	9
Unit - V	Global Prevalence and Secular Trends in Obesity: Regulation of Body Weight- Energy Expenditure and Physical Activity. Ageing and Health Related Aspects of Exercise. Health and Fitness	9

Essential Readings:

1. Lauralee, S. (2004). Human Physiology: From Cells to Systems. Thomson/Brooks/Cole Ed. Fifth Edition. Australia, 78.
2. Starling, E. H., Evans, C. L., Davson, H., & Eggleton, M. G. (1968). Principles of Human Physiology. Lea & Febiger.
3. Arthur, J., & Luciano, D. S. (2000). Human Physiology. The Mechanisms of Body Function.
4. Nageswari, K. S., & Sharma, R. (2006). Practical Workbook of Human Physiology. Jaypee Brothers.

Additional Readings:

1. Hale, T. (2005). Exercise Physiology: A Thematic Approach (Vol. 5). John Wiley & Sons.

M.Sc./ M.A., Group 'A', SEMESTER – FORTH

Anthropology

L	T	P	C
3	-	-	3

ANT - EC- 424 'A'

Human Cytogenetic

Maximum Marks : 100

Mid Semester = 40 (Ist mid 20+ continuous internal assessment 15+05*)

End Semester = 60

***Attendance**

Learning Outcomes :

The learning outcomes of this paper are:

1. The student will learn about different cytogenetic techniques used for prenatal diagnosis.
2. The student will learn about banding techniques.
3. They will learn about different chromosomal abnormalities and syndromes.
4. They will learn about sex determination and x-chromosome in-activation.
5. They will learn about Human Genome.

Unit - I	Cytogenetic in Relation to Human Genetics; Anthropological Significance. Scope and Development, Various Banding Techniques, Their Significance and Application. Sister Chromatic Exchange (SCE), In-Situ Fluorescent Level, High Resolution Banding.	9
Unit - II	Chromosomes Nomenclature, Chromosome Mapping. Mosaic and Chimeras; Structural and Numerical Chromosomal Aberrations and Causes. Chromosomal Syndromes: Down' Syndrome, Patau's Syndrome. Edwards Syndrome. True and Pseudo Hermaphrodites.	9
Unit - III	Methods of Studding Human Chromosomes From Peripheral Leucocytes, Sex Chromatin From Buccal Mucosa. Lyon's Hypothesis; X-Chromosomes Inactivation's and Reactivations; Sex-Linkage, Sex-Limited and Sex-Influenced Traits; Recent Concept in Human Sex Determination.	9
Unit - IV	Prenatal Detection of Chromosome Abnormalities. Cytogenetic of Human Pregnancy Wastage, Repeated Abortion and in Primary and Secondary Amenorrhea. Cancer Cytogenetic. Chromosome Polymorphism.	9
Unit - V	The Human Genome Organization: Morphology of Chromosomes and Classification, Movable Elements in the Human Genome. Genome Organization in the Light of Chromosome Banding Techniques. Current Status of Human Cytogenetic.	9

Essential Readings:

1. Lovejoy, C. O. (1981). The Origin of Man. *Science*, 211(4480), 341-350.
2. Spuhler, J. N. (1967). *Genetic Diversity and Human Behavior*. Transaction Publishers.
3. Steinberg, A. G. (1959). Methodology in Human Genetics. *American Journal of Human Genetics*, 11(2 Pt 2), 315.
4. Yunis, J. J. (2012). *Human Chromosome Methodology*. Academic Press.

Additional Reading:

1. Harris, H. (1959). *Human Biochemical Genetics*. Cambridge University Press.