Semester 1 Geography Honours
GEOACOR01T-Geotectonics and Geomorphology
4 Credits, 50 Marks (60 classes)
Session: July 2019-January 2020

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
1	Core Course	GEOACOR01T-Geotectonics and Geomorphology	Earth's Tectonic and Structural Evolution with Reference to Geological Time Scale	Lecture, visual aids, geological time charts	Quiz, short test	5 hours	SD
2	Core Course	GEOACOR01T-Geotectonics and Geomorphology	Earth's Interior with Special Reference to Seismology, Isostasy (Airy and Pratt Models)	Diagrams, cross-sections, and seismograph studies	Test, class discussion	6 hours	SD
3	Core Course	GEOACOR01T-Geotectonics and Geomorphology	Plate Tectonics: Processes and Landforms at Plate Margins and Hotspots	Lecture, case studies, maps	Assignment, test	6 hours	RB
4	Core Course	GEOACOR01T-Geotectonics and Geomorphology	Folds and Faults: Origin and Types	Diagrams, field studies	Class test	6 hours	RB
5	Core Course	GEOACOR01T-Geotectonics and Geomorphology	Degradational Processes: Weathering, Mass Wasting, and Resultant Landforms	Field observations, presentations	Assignment, quiz	5 hours	SR
6	Core Course	GEOACOR01T-Geotectonics and Geomorphology	Development of River Network and Landforms on Uniclinal and Folded Structures	Case studies, lecture, maps	Assignment	4 hours	SR
7	Core Course	GEOACOR01T-Geotectonics and Geomorphology	Landforms on Granite, Basalt, Limestone	Lecture, visuals, rock samples	Short test	3 hours	SR
8	Core Course	GEOACOR01T-Geotectonics and Geomorphology	Coastal, Glacial, and Fluvio-aeolian Processes and Landforms	Field studies, visual case studies	Test, assignment	6 hours	SC
9	Core Course	GEOACOR01T-Geotectonics and Geomorphology	Models of Landscape Evolution: Views of Davis, Penck, and Hack	Theoretical discussions, model analysis	Test	5 hours	SR

GEOACOR01P-Geotectonics and Geomorphology
2 Credits, 25 Marks (60 classes)
Session: July 2019-January 2020

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
1	Core Course	GEOACOR01P - Geotectonics and Geomorphology (Practical)	Megascopic Identification of Minerals	Practical demonstration, sample testing	Lab work, practical exam	6 hours	AR
2	Core Course	GEOACOR01P - Geotectonics and Geomorphology (Practical)	Megascopic Identification of Rock Samples	Hands-on identification	Lab assessment	6 hours	AR
3	Core Course	GEOACOR01P - Geotectonics and Geomorphology (Practical)	Interpretation of Geological Maps: Unconformity and Intrusions	Map interpretation, diagrams	Map reading test	6 hours	RB

Suggested Readings

1. Billings, M. P. (1971). *Structural geology*. Pearson.
2. Frisch, W., Meschede, M., & Blakey, R. C. (2011). *Plate tectonics: Continental drift and mountain building*. Springer.
3. Goudie, A. S. (Ed.). (2004). *Encyclopaedia of geomorphology* (Vols. 1 & 2). Routledge.
4. Gregory, K. J., & Lewin, J. (2014). *The basics of geomorphology: Key concepts*. Sage.
5. Harvey, A. (2012). *Introducing geomorphology: A guide to landforms and processes*. Dunedin Academic Press.
6. Kale, V. S., & Gupta, A. (2001). *Introduction to geomorphology*. Orient Longman.
7. Kearey, P., Klepeis, K. A., & Vine, F. J. (2011). *Global tectonics* (3rd ed.). Wiley-India.
8. Knighton, A. D. (1984). *Fluvial forms and processes*. Edward Arnold.
9. Selby, M. J. (1986). *Earth's changing surface*. Oxford University Press.
10. Strahler, A. (2016). *Introducing physical geography* (6th ed.). Wiley.

GEOACORO2T-Cartographic Techniques
4 Credit, 50 Marks (60 classes)
Session: July 2019-January 2020

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
1	Core Course	GEOACOR02T - Cartographic Techniques	Maps: Classification, Types, and Components	Lecture, map analysis	Class discussion	6 hours	AR
2	Core Course	GEOACOR02T - Cartographic Techniques	Concept and Application of Scales: Plain, Comparative, Diagonal, Vernier	Demonstration, graphical exercises	Practical test	6 hours	AR
3	Core Course	GEOACOR02T - Cartographic Techniques	Survey of India Topographical Maps: Reference Scheme and Information on Margins	Lecture, map reading, topographical maps	Test, discussion	6 hours	SR
4	Core Course	GEOACOR02T - Cartographic Techniques	Coordinate Systems: Polar and Rectangular	Lecture, examples on maps	Quiz	4 hours	RB
5	Core Course	GEOACOR02T - Cartographic Techniques	Generating Globe and UTM Projection	Lecture, practical exercises	Test, practical	6 hours	RB
6	Core Course	GEOACOR02T - Cartographic Techniques	Grids: Angular and Linear Systems of Measurement	Map exercise, grid creation	Practical work	4 hours	AR
7	Core Course	GEOACOR02T - Cartographic Techniques	Map Projections: Classification, Properties, and Uses	Lecture, projection diagrams	Assignment	6 hours	AR

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GEOACOR02P-Cartographic Techniques (Lab)
2 Credits, 25 Marks (90 classes)
Session: July 2019-January 2020

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
1	Core Course	GEOACOR02P - Cartographic Techniques (Practical)	Graphical Construction of Scales: Plain, Comparative, Diagonal, Vernier	Practical exercises, graphing	Practical exam	10 hours	AR
2	Core Course	GEOACOR02P - Cartographic Techniques (Practical)	Construction of Projections: Zenithal Stereographic, Simple Conic, Mercator's, Bonne's	Practical exercises	Lab assessment	20 hours	RB
3	Core Course	GEOACOR02P - Cartographic Techniques (Practical)	Delineation of Drainage Basin and Interpretation of Relief Profiles	Topographical map exercises, drainage delineation	Lab assessment	20 hours	SR

Suggested Readings

1. Kennedy, M., & Kopp, S. (2001). *Understanding map projections*. Esri Press.
2. Kimerling, A. J., Buckley, A. R., Muehrcke, P. C., & Muehrcke, J. O. (2011). *Map use: Reading, analysis, interpretation* (7th ed.). Esri Press.
3. Monkhouse, F. J., & Wilkinson, H. R. (1971). *Maps and diagrams: Their compilation and construction* (3rd ed., 2017 reprint). Alphaneumera-Kolkata.
4. Pearson II, F. (1990). *Map projections: Theory and applications* (2nd ed.). CRC Press.
5. Robinson, A. H., Morrison, J. L., Phillip, C. M., Kimerling, A. J., & Guptill, S. C. (1995). *Elements of cartography* (6th ed.). Wiley.
6. Sarkar, A. (2015). *Practical geography: A systematic approach* (3rd ed.). Orient Blackswan Private Ltd.
7. Singh, R. L., & Singh, R. P. B. (2008). *Elements of practical geography*. Kalyani Publishers.
8. Vaidyanadhan, R., & Subbarao, K. V. (2014). *Landforms of India from topomaps and images*. Geological Society of India.

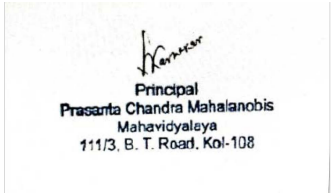
Semester 2 Geography Honours
GEOACOR03T: Human Geography
(6 Credits, 75 Marks, 90 Classes)
Lesson Plan
January 2020- June 2020

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1-2	Honours	GEOACOR03T: Human Geography	Nature, scope, and recent trends of Human Geography; Elements of Human Geography	PPT, ICT mode, reference books, class discussions	Continuous evaluation, Class Test	8 hours	RB Madam
Week 3-4	Honours	GEOACOR03T: Human Geography	Approaches to Human Geography: Resource, Locational, Landscape, Environmental	PPT, ICT mode, case studies, readings	Continuous evaluation, Class Test	8 hours	AR Madam
Week 5-6	Honours	GEOACOR03T: Human Geography	Concepts of race and ethnicity; classification of race	Lecture, PPT, ICT mode, academic readings	Class Test, Continuous evaluation	6 hours	SR Sir
Week 7	Honours	GEOACOR03T: Human Geography	Space, society, and cultural regions (language and religion)	PPT, ICT mode, textbook references	Class Test, Continuous evaluation	6 hours	SR Sir
Week 8-9	Honours	GEOACOR03T: Human Geography	Evolution of human societies: Hunting and food gathering, pastoral nomadism, subsistence farming, industrial society	Lecture, ICT mode, visual aids	Class Test, Continuous evaluation	8 hours	SC Madam
Week 10-11	Honours	GEOACOR03T: Human Geography	Human adaptation to the environment: Eskimos, Maasai, and Maori	PPT, ICT mode, field studies, videos	Continuous evaluation, Class Test	8 hours	SC Madam
Week 12-13	Honours	GEOACOR03T: Human Geography	Population growth, distribution, composition; demographic transition theory	PPT, ICT mode, statistical analysis, readings	Class Test, Continuous evaluation	8 hours	RB Madam
Week 14-15	Honours	GEOACOR03T: Human Geography	Population-resource regions (Ackerman)	Lecture, case studies, PPT, ICT mode	Continuous evaluation, Class Test	6 hours	AR Madam
Week 16-17	Honours	GEOACOR03T: Human Geography	Types and patterns of rural settlements	PPT, ICT mode, visual examples	Class Test, Continuous evaluation	6 hours	AR Madam

Week 18-19	Honours	GEOACOR03T: Human Geography	Morphology of urban settlements	PPT, ICT mode, urban models, references	Class Test, Continuous evaluation	6 hours	AR Madam

Suggested readings

1. Kennedy, M., & Kopp, S. (2001). *Understanding map projections*. Esri Press.
2. Kimerling, A. J., Buckley, A. R., Muehrcke, P. C., & Muehrcke, J. O. (2011). *Map use: Reading, analysis, interpretation* (7th ed.). Esri Press.
3. Monkhouse, F. J., & Wilkinson, H. R. (1971). *Maps and diagrams: Their compilation and construction* (3rd ed., 2017 reprint). Alphaneumera-Kolkata.
4. Pearson II, F. (1990). *Map projections: Theory and applications* (2nd ed.). CRC Press.
5. Robinson, A. H., Morrison, J. L., Phillip, C. M., Kimerling, A. J., & Guptill, S. C. (1995). *Elements of cartography* (6th ed.). Wiley.
6. Sarkar, A. (2015). *Practical geography: A systematic approach* (3rd ed.). Orient Blackswan Private Ltd.
7. Singh, R. L., & Singh, R. P. B. (2008). *Elements of practical geography*. Kalyani Publishers.
8. Vaidyanadhan, R., & Subbarao, K. V. (2014). *Landforms of India from topomaps and images*. Geological Society of India.



GEOACOR04T: Cartograms and Thematic Mapping
(4 Credits, 50 Marks, 60 Classes)
January 2020- June 2020

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1-2	Honours	GEOACOR04T: Cartograms and Thematic Mapping	Concepts: rounding, scientific notation, logarithms, anti-logarithms, natural and log scales	Lecture, PPT, ICT mode	Class Test, Continuous evaluation	10 hours	RB Madam
Week 3-4	Honours	GEOACOR04T: Cartograms and Thematic Mapping	Diagrammatic representation of data: Line, bar, isopleths	Lecture, PPT, data analysis	Class Test, Continuous evaluation	10 hours	SC Madam
Week 5-6	Honours	GEOACOR04T: Cartograms and Thematic Mapping	Representation of area data: Dots, spheres, proportional circles, choropleth maps	PPT, ICT mode, map reading, visual aids	Class Test, Continuous evaluation	10 hours	SR Sir
Week 7-8	Honours	GEOACOR04T: Cartograms and Thematic Mapping	Preparation and interpretation of land use/land cover maps	Practical examples, case studies, PPT	Class Test, Continuous evaluation	10 hours	AR Madam
Week 9-10	Honours	GEOACOR04T: Cartograms and Thematic Mapping	Preparation and interpretation of socio-economic maps	PPT, ICT mode, map interpretation	Class Test, Continuous evaluation	10 hours	AR Madam
Week 11	Honours	GEOACOR04T: Cartograms and Thematic Mapping	Bearings: Magnetic and true; whole-circle and reduced bearings	Lecture, hands-on practice	Continuous evaluation	6 hours	RB Madam
Week 12	Honours	GEOACOR04T: Cartograms and Thematic Mapping	Basic surveying concepts and equipment: Prismatic Compass, Dumpy Level, Theodolite	PPT, field equipment demonstration	Class Test, Practical evaluation	6 hours	RB Madam

GEOACOR04P: Cartograms and Thematic Mapping (Lab)
(2 Credits, 25 Marks, 60 Classes)
January 2020- June 2020

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1-2	Honours	GEOACOR04P: Cartograms and Thematic Mapping (Lab)	Thematic Maps: Choropleth maps showing population density	Practical, mapping techniques, ICT mode	Continuous evaluation, Class Test	10 hours	SC Madam
Week 3-4	Honours	GEOACOR04P: Cartograms and Thematic Mapping (Lab)	Thematic Maps: Dots and spheres for rural/urban population distribution	Hands-on, data representation, ICT mode	Class Test, Continuous evaluation	10 hours	SR Sir
Week 5-6	Honours	GEOACOR04P: Cartograms and Thematic Mapping (Lab)	Proportional pie diagrams for economic and land use data	Practical work, ICT mode	Continuous evaluation	10 hours	SR Sir
Week 7-9	Honours	GEOACOR04P: Cartograms and Thematic Mapping (Lab)	Traverse survey using a prismatic compass; Profile survey using Dumpy Level	Fieldwork, practical demonstrations	Continuous evaluation, Practical test	30 hours	RB Madam and AR Madam

Suggested Readings

1. Basak, N. N. (2017). *Surveying and levelling* (2nd ed.). McGraw Hill Education.
2. Bolton, T. (2009). *Geological maps: Their solution and interpretation* (reprint). Cambridge University Press.
3. Kanetkar, T. P., & Kulkatni, S. V. (1988). *Surveying and levelling, Part I*. Pune Vidyarthi Griha Prakashan.
4. Monkhouse, F. J., & Wilkinson, H. R. (1971). *Maps and diagrams: Their compilation and construction* (3rd ed., 2017 reprint). Alphaneumera-Kolkata.
5. Robinson, A. H., Morrison, J. L., Phillip, C. M., Kimerling, A. J., & Guptill, S. C. (1995). *Elements of cartography* (6th ed.). Wiley.
6. Sarkar, A. (2015). *Practical geography: A systematic approach* (3rd ed.). Orient Blackswan Private Ltd.
7. Singh, R. L., & Singh, R. P. B. (2008). *Elements of practical geography*. Kalyani Publishers.
8. Subramanian, R. (2012). *Surveying and levelling* (2nd ed.). Oxford University Press.

SEMESTER-3 CBCS

GEOACOR05T - Climatology

4 Credits, 50 Marks (60 Classes)

Session: July 2019-January 2020

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1	Honours	GEOACOR05T - Climatology	Nature, Composition, and Layering of the Atmosphere	Lecture, diagrams, textbooks, PPT	Class participation, short quizzes	6 hours	AR
Week 2	Honours	GEOACOR05T - Climatology	Insolation: Controlling Factors and Heat Budget of the Atmosphere	Lecture, visual aids, graphs	Quiz, assignments	6 hours	AR
Week 3	Honours	GEOACOR05T - Climatology	Temperature: Horizontal and Vertical Distribution, Inversion of Temperature	Diagrams, case studies	Short essay, participation	6 hours	AR
Week 4	Honours	GEOACOR05T - Climatology	Greenhouse Effect and Ozone Layer	Case studies, discussions, textbooks	Written test, class discussion	4 hours	AR
Week 5	Honours	GEOACOR05T - Climatology	Condensation and Precipitation Mechanisms	Visualizations, charts, lecture	Diagram-based assessment	6 hours	SD
Week 6	Honours	GEOACOR05T - Climatology	Air Masses: Typology, Origin, Characteristics, and Modification	Case studies, charts	Group discussion, short test	6 hours	SD
Week 7	Honours	GEOACOR05T - Climatology	Fronts: Warm and Cold, Frontogenesis and Frontolysis	Charts, diagrams, lecture	Class participation, diagram test	6 hours	SD
Week 8	Honours	GEOACOR05T - Climatology	Weather: Stability and Instability, Barotropic and Baroclinic Conditions	Case studies, lecture	Quiz, class discussion	5 hours	RB
Week 9	Honours	GEOACOR05T - Climatology	Circulation in the Atmosphere: Planetary Winds, Jet Streams, and Index Cycle	Visual aids, maps	Written test, participation	5 hours	RB

Week 10	Honours	GEOACOR05T - Climatology	Tropical and Mid-Latitude Cyclones	Diagrams, case studies	Class participation, assessment	6 hours	SC
Week 11	Honours	GEOACOR05T - Climatology	Monsoon Circulation and Mechanism with Reference to India	Case studies, charts, lecture	Quiz, written assignment	6 hours	SC
Week 12	Honours	GEOACOR05T - Climatology	Climatic Classification Systems: Köppen, Thornthwaite, and Oliver	Lecture, textbooks, case studies	Quiz, assignment	4 hours	SC

GEOACOR05P - Climatology (Practical)
2 Credits, 25 Marks (60 Classes)
Session: July 2019-January 2020

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1	Honours	GEOACOR05P - Climatology	Interpretation of Daily Weather Maps (Pre-Monsoon, Monsoon, Post-Monsoon)	Daily weather maps, charts	Practical assessment, report submission	8 hours	AR
Week 2	Honours	GEOACOR05P - Climatology	Construction and Interpretation of Hythergraph and Climograph	Graph paper, climate data	Practical assessment	6 hours	AR
Week 3	Honours	GEOACOR05P - Climatology	Construction and Interpretation of Wind Rose	Wind data, graphs	Practical test, submission	6 hours	SC
Week 4	Honours	GEOACOR05P - Climatology	Project File	Project materials, weather data	Project submission and evaluation	6 hours	SC/SR/SD

Suggested Readings

1. Ahrens, C. D. (2012). *Essentials of meteorology: An invitation to the atmosphere* (9th ed.). Cengage Learning.
2. Barry, R. G., & Chorley, R. J. (2009). *Atmosphere, weather and climate* (9th ed.). Routledge.
3. Critchfield, H. J. (1983). *General climatology*. Prentice Hall India Ltd. (2010 reprint).
4. Lal, D. S. (2012). *Climatology*. Sharda Pustak Bhawan.
5. Lutgens, F. K., & Tarbuck, E. J. (1998). *The atmosphere: An introduction to meteorology* (9th ed.). Prentice Hall Inc.
6. Oliver, J. E., & Hidore, J. J. (2002). *Climatology: An atmospheric science*. Pearson Education India.

GEOACOR07T - Statistical Methods in Geography

4 Credits, 40 Marks (60 Classes)

Session: July 2019-January 2020

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1-2	Honours	GEOACOR07T - Statistical Methods in Geography	Importance and Significance of Statistics in Geography	Lecture, case studies, textbooks	Short quiz, class discussion	5 hours	RB
Week 3	Honours	GEOACOR07T - Statistical Methods in Geography	Discrete and Continuous Data, Population and Samples, Scales of Measurement	Lecture, visual aids, examples	Written test, participation	6 hours	RB
Week 4	Honours	GEOACOR07T - Statistical Methods in Geography	Sources of Geographical Data for Statistical Analysis	Textbooks, case studies	Short quiz, participation	4 hours	RB
Week 5-6	Honours	GEOACOR07T - Statistical Methods in Geography	Data Collection and Formation of Statistical Tables	Lecture, diagrams, examples	Assignment, class participation	5 hours	RB
Week 7-8	Honours	GEOACOR07T - Statistical Methods in Geography	Sampling: Types, Significance, and Methods of Random Sampling	Lecture, case studies, examples	Group discussion, quiz	6 hours	RB
Week 9	Honours	GEOACOR07T - Statistical Methods in Geography	Theoretical Distribution: Frequency, Cumulative Frequency, Normal and Probability Distribution	Lecture, statistical tools	Written test, diagram-based assessment	6 hours	RB
Week 10	Honours	GEOACOR07T - Statistical Methods in Geography	Central Tendency: Mean, Median, Mode, and Partition Values	Lecture, case studies, practical examples	Class test, quiz	6 hours	RB
Week 11-12	Honours	GEOACOR07T - Statistical Methods in Geography	Measures of Dispersion: Range, Mean Deviation, Standard Deviation, Coefficient of Variation	Lecture, statistical exercises	Practical test, participation	6 hours	RB

Week 13-14	Honours	GEOACOR07T - Statistical Methods in Geography	Association and Correlation: Rank Correlation, Product Moment Correlation	Lecture, exercises, case studies	Short test, quiz	5 hours	RB
Week 15	Honours	GEOACOR07T - Statistical Methods in Geography	Regression: Linear and Non-linear	Lecture, statistical tools, examples	Assignment, quiz	6 hours	RB
Week 16	Honours	GEOACOR07T - Statistical Methods in Geography	Time Series Analysis: Moving Average	Lecture, statistical tools, exercises	Class test, participation	5 hours	RB

GEOACOR07P - Statistical Methods in Geography (Lab)
2 Credits, 25 Marks (60 Classes)
Session: July 2019-January 2020

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1-3	Honours	GEOACOR07P - Statistical Methods in Geography (Lab)	Construction of Data Matrix Representing Areal Units (Districts, Blocks, Towns)	Maps, statistical software	Practical assessment, report submission	6 hours	RB
Week 4-5	Honours	GEOACOR07P - Statistical Methods in Geography (Lab)	Computation of Frequency Tables, Measures of Central Tendency, and Dispersion	Statistical tools, data tables	Practical test, report submission	6 hours	RB
Week 6-8	Honours	GEOACOR07P - Statistical Methods in Geography (Lab)	Sampling Techniques: Random, Systematic, and Stratified	Sampling exercises, maps	Report submission, assessment	6 hours	SR
Week 9-12	Honours	GEOACOR07P - Statistical Methods in Geography (Lab)	Scatter Diagram and Linear Regression Line, Residual Mapping	Statistical software, maps, data sets	Practical test, report submission	6 hours	SR

Suggested Readings

1. Acevedo, M. F. (2012). *Data analysis and statistics for geography, environmental science and engineering*. CRC Press.
2. Harris, R., & Jarvis, C. (2011). *Statistics for geography and environmental science*. Prentice Hall.
3. McGrew Jr., J. C., Lembo Jr., A. J., & Monroe, C. B. (2014). *An introduction to statistical problem solving in geography* (3rd ed.). Waveland Press.
4. Pal, S. K. (1998). *Statistics for geoscientists: Techniques and applications*. Concept Pub Co.
5. Rogerson, P. A. (2015). *Statistical methods for geography: A student's guide* (4th ed.). Sage.
6. Sarkar, A. (2015). *Practical geography: A systematic approach* (3rd ed.). Orient Blackswan.

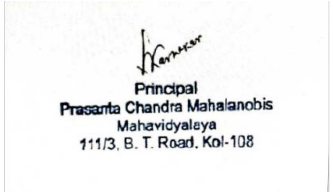
Semester 4 CBCS
Lesson Plan
Session: January 2020- June 2020
GEOACOR08T: Regional Planning and Development (6 Credits, 75 Marks, 90 Classes)

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1-2	Honours	GEOACOR08T: Regional Planning and Development	Concept of regions: Types and delineation	Lecture, PPT, case studies, ICT mode	Class Test, Continuous evaluation	10 hours	SR Sir
Week 3-4	Honours	GEOACOR08T: Regional Planning and Development	Regional planning: Types, principles, objectives, tools, and techniques	PPT, ICT mode, academic readings	Continuous evaluation, Class Test	10 hours	SR Sir
Week 5-6	Honours	GEOACOR08T: Regional Planning and Development	Need for regional planning in India; multi-level planning in India	Lecture, PPT, case studies	Class Test, Continuous evaluation	10 hours	SR Sir
Week 7	Honours	GEOACOR08T: Regional Planning and Development	Metropolitan concepts and urban agglomerations	PPT, ICT mode, textbook readings	Class Test, Continuous evaluation	8 hours	SR Sir
Week 8-9	Honours	GEOACOR08T: Regional Planning and Development	Concepts of growth and development: Growth vs. development	Lecture, PPT, ICT mode	Class Test, Continuous evaluation	8 hours	AR Madam
Week 10-11	Honours	GEOACOR08T: Regional Planning and Development	Development indicators: Economic, social, and environmental	PPT, ICT mode, case studies	Continuous evaluation, Class Test	8 hours	AR Madam
Week 12	Honours	GEOACOR08T: Regional Planning and Development	Human development: Concepts and measurements	Lecture, PPT, data analysis	Class Test, Continuous evaluation	6 hours	AR Madam
Week 13-14	Honours	GEOACOR08T: Regional Planning and Development	Theories and models of regional development: Myrdal's cumulative causation	Lecture, ICT mode, case studies	Continuous evaluation, Class Test	8 hours	AR Madam
Week 15-16	Honours	GEOACOR08T: Regional Planning and Development	Theories and models of regional development: Rostow's stages of development, Perroux's growth pole model	PPT, ICT mode, visual models	Class Test, Continuous evaluation	8 hours	AR Madam

Week 17	Honours	GEOACOR08T: Regional Planning and Development	Causes of underdevelopment	Lecture, case studies, PPT	Class Test, Continuous evaluation	6 hours	SC Madam
Week 18-19	Honours	GEOACOR08T: Regional Planning and Development	Regional development in India: Disparities and diversity	PPT, ICT mode, case studies	Continuous evaluation, Class Test	8 hours	SC Madam
Week 20	Honours	GEOACOR08T: Regional Planning and Development	Measures for balanced development in India	Lecture, case studies, ICT mode	Class Test, Continuous evaluation	8 hours	SC Madam

Suggested Readings

1. Bhargava, G. (2001). *Development of India's urban, rural, and regional planning in the 21st century: Policy perspective*. Gyan Publishing House.
2. Chand, M., & Puri, V. K. (2000). *Regional planning in India*. Allied Publishers Ltd.
3. Chandana, R. C. (2016). *Regional planning and development* (6th ed.). Kalyani Publishers.
4. Glasson, J. (2017). *Contemporary issues in regional planning*. Routledge.
5. Gore, C. (2011). *Regions in question: Space, development theory, and regional policy*. Routledge.
6. Gregory, D., Johnston, R., Pratt, G., Watts, M., & Whatmore, S. (Eds.). (2009). *The dictionary of human geography* (5th ed.). Wiley.
7. Hall, P., & Tewdwr-Jones, M. (2010). *Urban and regional planning*. Routledge.
8. Higgins, B., & Savoie, D. J. (2017). *Regional development: Theories and their application*. Routledge.
9. Kulshetra, S. K. (2012). *Urban and regional planning in India: A handbook for professional practitioners*. Sage Publications.



GEOACOR09T: Economic Geography (6 Credits, 75 Marks, 90 Classes)

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1-2	Honours	GEOACOR09T: Economic Geography	Meaning and approaches to Economic Geography	Lecture, PPT, case studies, ICT mode	Class Test, Continuous evaluation	10 hours	SR Sir
Week 3-4	Honours	GEOACOR09T: Economic Geography	Concepts in Economic Geography: Goods and services, production, exchange, consumption	PPT, ICT mode, academic readings	Continuous evaluation, Class Test	10 hours	SR Sir
Week 5	Honours	GEOACOR09T: Economic Geography	Theories of choice and the concept of the "economic man"	Lecture, PPT, ICT mode	Class Test, Continuous evaluation	8 hours	SR Sir
Week 6	Honours	GEOACOR09T: Economic Geography	Economic distance and transport costs	Lecture, PPT, case studies	Class Test, Continuous evaluation	6 hours	SR Sir
Week 7-8	Honours	GEOACOR09T: Economic Geography	Concepts and classification of economic activities	Lecture, PPT, ICT mode	Class Test, Continuous evaluation	10 hours	RB Madam
Week 9-10	Honours	GEOACOR09T: Economic Geography	Factors influencing the location of economic activities: Agriculture (Von Thünen), Industry (Weber)	PPT, ICT mode, case studies	Continuous evaluation, Class Test	10 hours	RB Madam
Week 11-12	Honours	GEOACOR09T: Economic Geography	Primary activities: Agriculture, forestry, fishing, and mining	Lecture, PPT, case studies	Class Test, Continuous evaluation	8 hours	SC Madam
Week 13-14	Honours	GEOACOR09T: Economic Geography	Secondary activities: Manufacturing (cotton textiles, iron, and steel); Special economic zones and technology parks	PPT, ICT mode, case studies	Continuous evaluation, Class Test	8 hours	SC Madam
Week 15	Honours	GEOACOR09T: Economic Geography	Tertiary activities: Transport, trade, services	Lecture, PPT, data analysis	Class Test, Continuous evaluation	6 hours	SC Madam
Week 16-17	Honours	GEOACOR09T: Economic Geography	Agricultural systems: Case studies of tea plantations (India) and mixed farming (Europe)	Lecture, case studies, ICT mode	Class Test, Continuous evaluation	8 hours	RB Madam

Week 18-19	Honours	GEOACOR09T: Economic Geography	Transnational sea routes, railways, and highways (with reference to India)	PPT, ICT mode, case studies	Continuous evaluation, Class Test	8 hours	RB Madam
Week 20	Honours	GEOACOR09T: Economic Geography	International trade and economic blocs: WTO, GATT, BRICS	Lecture, case studies, ICT mode	Class Test, Continuous evaluation	6 hours	RB Madam

Suggested Readings

1. Khullar, D. R. (2011). *India: A comprehensive geography*. Kalyani Publishers.
2. Monkhouse, F. J., & Wilkinson, H. R. (1971). *Maps and diagrams: Their compilation and construction* (3rd ed., 2017 reprint). Alphaneumera-Kolkata.
3. Sharma, T. C. (2012). *Economic geography of India*. Rawat Publications.
4. Saxena, H. M. (2005). *Transport geography*. Rawat Publications.

GEOACOR10T: Environmental Geography (4 Credits, 50 Marks, 60 Classes)

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1-2	Honours	GEOACOR10T: Environmental Geography	Geographical approaches to environmental studies	Lecture, PPT, case studies	Class Test, Continuous evaluation	8 hours	RB Madam
Week 3	Honours	GEOACOR10T: Environmental Geography	Holistic environment and systems approach	Lecture, PPT, ICT mode	Continuous evaluation, Class Test	6 hours	RB Madam
Week 4	Honours	GEOACOR10T: Environmental Geography	Ecosystems: Concepts, structure, and functions	PPT, ICT mode, case studies	Continuous evaluation, Class Test	6 hours	RB Madam
Week 5-6	Honours	GEOACOR10T: Environmental Geography	Space-time hierarchy of environmental problems: Local, regional, global	Lecture, PPT, case studies	Continuous evaluation, Class Test	10 hours	RB Madam
Week 7-8	Honours	GEOACOR10T: Environmental Geography	Environmental pollution and degradation: Land, water, air	Lecture, PPT, case studies	Class Test, Continuous evaluation	8 hours	AR Madam
Week 9	Honours	GEOACOR10T: Environmental Geography	Urban environmental issues: Waste management	Lecture, case studies, ICT mode	Continuous evaluation, Class Test	6 hours	AR Madam

Week 10	Honours	GEOACOR10T: Environmental Geography	Environmental policies: National Environmental Policy (2006), Earth Summits (Stockholm, Rio, Johannesburg)	Lecture, PPT, case studies	Continuous evaluation, Class Test	6 hours	AR Madam
Week 11-12	Honours	GEOACOR10T: Environmental Geography	Global environmental initiatives: Montreal Protocol, Kyoto Protocol, Paris Climate Agreement	Lecture, ICT mode, case studies	Continuous evaluation, Class Test	10 hours	AR Madam

GEOACOR10P: Environmental Geography (Lab) (2 Credits, 25 Marks, 60 Classes)

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1-3	Honours	GEOACOR10P: Environmental Geography (Lab)	Preparing questionnaires for perception surveys on environmental problems	Practical work, data collection, PPT	Continuous evaluation	15 hours	SC Madam
Week 4-6	Honours	GEOACOR10P: Environmental Geography (Lab)	Checklists for Environmental Impact Assessments of urban/industrial projects	Practical work, field data	Class Test, Continuous evaluation	15 hours	RB Madam
Week 7-10	Honours	GEOACOR10P: Environmental Geography (Lab)	Interpreting air quality using CPCB/WBPCB data	Practical work, data interpretation, PPT	Continuous evaluation	30 hours	AR Madam

Suggested Readings

1. Ahrens, C. D. (2012). *Essentials of meteorology: An invitation to the atmosphere* (9th ed.). Cengage Learning.
2. Barry, R. G., & Chorley, R. J. (2009). *Atmosphere, weather and climate* (9th ed.). Routledge.
3. Chapman, J. L., & Reiz, M. J. (1993). *Ecology: Principles and applications*. Cambridge University Press.
4. Cox, B., Moore, P. D., & Ladle, R. (2016). *Biogeography: An ecological and evolutionary approach* (9th ed.). Wiley-Blackwell.
5. Daji, J. A., Kadam, J. R., & Patil, N. D. (1996). *A textbook of soil science*. Media Promoters and Publishers Pvt Ltd.
6. Dash, M. C. (2001). *Fundamentals of ecology* (2nd ed.). Tata McGraw-Hill.
7. Dey, N. K., & Ghosh, P. (1993). *India: A study in soil geography*. Sribhumi Publishing Company.
8. Lal, D. S. (2012). *Climatology*. Sharda Pustak Bhawan.
9. Lutgens, F. K., Tarbuck, E. J., & Tasa, D. G. (2015). *The atmosphere: An introduction to meteorology* (13th ed.). Pearson.

GEOSSEC02M: Advanced Spatial Statistical Techniques (2 Credits, 25 Marks, 30 Classes)

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1-3	Honours	GEOSSEC02M: Advanced Spatial Statistical Techniques	Probability theory and distributions (Normal, Binomial, Poisson) and their geographical applications	Lecture, PPT, case studies, ICT mode, software tools (SPSS/MS Excel/R)	Class Test, Continuous evaluation	9 hours	RB Madam
Week 4-6	Honours	GEOSSEC02M: Advanced Spatial Statistical Techniques	Sampling: Plans for spatial/non-spatial data, sampling distributions, and estimates	Lecture, PPT, ICT mode, software tools (SPSS/MS Excel/R)	Continuous evaluation, Class Test	9 hours	RB Madam
Week 7-8	Honours	GEOSSEC02M: Advanced Spatial Statistical Techniques	Correlation and regression: Rank-order correlation, linear regression, multivariate analysis	Lecture, PPT, ICT mode, case studies, software tools (SPSS/MS Excel/R)	Continuous evaluation, Class Test	6 hours	AR Madam
Week 9-10	Honours	GEOSSEC02M: Advanced Spatial Statistical Techniques	Time-series analysis: Processes, smoothing, and components	Lecture, PPT, software tools (SPSS/MS Excel/R)	Class Test, Continuous evaluation	6 hours	AR Madam
Ongoing	Honours	GEOSSEC02M: Advanced Spatial Statistical Techniques	Project File: Submission of four exercises on probability, sampling, correlation, regression, and time-series analysis using statistical software	Project-based evaluation, Practical sessions	Throughout the course		RB Madam, AR Madam

Suggested Readings

1. Acevedo, M. F. (2012). *Data analysis and statistics for geography, environmental science and engineering*. CRC Press.
2. Harris, R., & Jarvis, C. (2011). *Statistics for geography and environmental science*. Prentice Hall.
3. Sarkar, A. (2015). *Practical geography: A systematic approach* (3rd ed.). Orient Blackswan.

General Cartography (Semester 3 CBCS)
GEOGCOR03T - General Cartography (Theory)
Session: July 2019-January 2020

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1-2	General	GEOGCOR03T - General Cartography	Concept of Map Scale: Types, Applications, and Reading Distances on Maps	Lecture, case studies, maps	Short quiz, class discussion	6 hours	AR
Week 3	General	GEOGCOR03T - General Cartography	Map Projections: Criteria for Choosing Projections	Lecture, diagrams, textbooks	Written test, quiz	6 hours	RB
Week 4	General	GEOGCOR03T - General Cartography	Zenithal Gnomonic (Polar Case) Projection	Diagrams, map exercises	Practical evaluation, assignment	6 hours	RB
Week 5-6	General	GEOGCOR03T - General Cartography	Zenithal Stereographic (Polar Case) Projection	Diagrams, map exercises	Written test, class participation	6 hours	RB
Week 7-8	General	GEOGCOR03T - General Cartography	Cylindrical Equal Area Projection	Diagrams, examples	Assignment, quiz	5 hours	RB
Week 9	General	GEOGCOR03T - General Cartography	Mercator's Projection	Lecture, diagrams, examples	Short test, class discussion	6 hours	RB
Week 10	General	GEOGCOR03T - General Cartography	Bonne's Projection	Diagrams, examples	Written test, practical evaluation	6 hours	RB
Week 11-12	General	GEOGCOR03T - General Cartography	UTM Projection (Universal Transverse Mercator)	Lecture, diagrams, examples	Assignment, class participation	5 hours	RB
Week 13-14	General	GEOGCOR03T - General Cartography	Survey of India Topographical Maps: Reference Scheme of Old and Open Series	Case studies, maps, exercises	Quiz, class participation	5 hours	SR
Week 14-15	General	GEOGCOR03T - General Cartography	Information on the Map Margins	Lecture, examples from topographical maps	Assignment, class participation	5 hours	SR

Week 15-16	General	GEOGCOR03T - General Cartography	Representation of Data: Symbols, Dot Maps, Choropleth Maps, Isopleth Maps, Flow Diagrams	Case studies, examples, practical exercises	Written test, diagram-based assessment	6 hours	SC
Week 16-18	General	GEOGCOR03T - General Cartography	Interpretation of Thematic Maps	Case studies, practical exercises	Quiz, class participation	4 hours	SC

GEOGCOR03P - General Cartography (Practical)

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1-2	General	GEOGCOR03P - General Cartography (Practical)	Graphical Construction of Plain Scales	Graph papers, scales, case studies	Practical assessment	4 hours	AR
Week 3	General	GEOGCOR03P - General Cartography (Practical)	Graphical Construction of Comparative Scales	Graph papers, case studies, examples	Practical assessment	6 hours	AR
Week 4	General	GEOGCOR03P - General Cartography (Practical)	Construction of Zenithal Gnomonic (Polar Case) Projection	Graph papers, diagrams, case studies	Practical test, submission	6 hours	RB
Week 5-6	General	GEOGCOR03P - General Cartography (Practical)	Construction of Zenithal Stereographic (Polar Case) Projection	Graph papers, case studies, diagrams	Practical test, submission	6 hours	RB
Week 7-8	General	GEOGCOR03P - General Cartography (Practical)	Construction of Cylindrical Equal Area Projection	Graph papers, case studies, diagrams	Practical test, submission	6 hours	RB
Week 9	General	GEOGCOR03P - General Cartography (Practical)	Construction of Mercator's Projection	Graph papers, diagrams, case studies	Practical test, submission	6 hours	RB
Week 10	General	GEOGCOR03P - General Cartography (Practical)	Construction of Bonne's Projection	Graph papers, case studies, diagrams	Practical test, submission	6 hours	RB

Week 11-12	General	GEOGCOR03P - General Cartography (Practical)	Construction and Interpretation of Relief Profiles: Superimposed, Projected, and Composite Profiles	Topographical maps, case studies	Practical test, submission	8 hours	SR
Week 13-14	General	GEOGCOR03P - General Cartography (Practical)	Construction of Relative Relief Maps and Slope Maps (Wentworth Method)	Graph papers, maps, case studies	Practical test, submission	8 hours	SR
Week 14-15	General	GEOGCOR03P - General Cartography (Practical)	Correlation Between Physical and Cultural Features Using Transect Charts	Graph papers, maps, charts	Practical test, submission	6 hours	SR

Suggested Readings

9. Kennedy, M., & Kopp, S. (2001). *Understanding map projections*. Esri Press.
10. Kimerling, A. J., Buckley, A. R., Muehrcke, P. C., & Muehrcke, J. O. (2011). *Map use: Reading, analysis, interpretation* (7th ed.). Esri Press.
11. Monkhouse, F. J., & Wilkinson, H. R. (1971). *Maps and diagrams: Their compilation and construction* (3rd ed., 2017 reprint). Alphaneumera-Kolkata.
12. Pearson II, F. (1990). *Map projections: Theory and applications* (2nd ed.). CRC Press.
13. Robinson, A. H., Morrison, J. L., Phillip, C. M., Kimerling, A. J., & Guptill, S. C. (1995). *Elements of cartography* (6th ed.). Wiley.

GEOSSEC01M - Remote Sensing (Skill Enhancement Course) for Honours

GEOSSEC01M - Remote Sensing

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1-2	Programme Course	GEOSSEC01M - Remote Sensing	Principles of Remote Sensing (RS): Classification of RS Satellites and Sensors	Lecture, visual aids, satellite data examples	Class discussion, short quiz	5 hours	CR
Week 3	Programme Course	GEOSSEC01M - Remote Sensing	Sensor Resolutions: Applications with Reference to IRS and Landsat Missions	Lecture, sensor data, satellite imagery	Written test, class discussion	5 hours	RB
Week 4	Programme Course	GEOSSEC01M - Remote Sensing	Image Referencing Schemes and Data Acquisition	Lecture, practical examples, case studies	Assignment, quiz	4 hours	RB
Week 5-6	Programme Course	GEOSSEC01M - Remote Sensing	Preparation of False Colour Composites Using IRS LISS-3, Landsat TM, and OLI Data	Lab work, satellite imagery, software tools	Practical assessment, project work	6 hours	SR
Week 7-8	Programme Course	GEOSSEC01M - Remote Sensing	Principles of Image Rectification and Enhancement	Lab work, image processing software	Practical assessment, class participation	3 hours	SR
Week 9	Programme Course	GEOSSEC01M - Remote Sensing	Image Interpretation and Feature Extraction: Preparation of Inventories for Land Use/Land Cover Features	Lab work, satellite imagery, mapping tools	Practical evaluation, project file submission	5 hours	RB
Week 10	Programme Course	GEOSSEC01M - Remote Sensing	Project File Submission	Compilation of exercises from all units	Project file evaluation	-	All Teachers

Project File Requirements:

A project file with four exercises covering:

1. Principles of Remote Sensing and Satellite Classification.

2. Sensor Resolutions and Applications.
3. Preparation of False Colour Composites (FCC).
4. Image Interpretation and Land Use Feature Extraction.

This plan ensures a balance between theoretical understanding and practical application in Remote Sensing, with a focus on project-based learning.

Suggested Readings

1. Bhatta, B. (2011). *Global navigation satellite systems: Insights into GPS, GLONASS, Galileo, Compass and others*. CRC Press.
2. Bhatta, B. (2011). *Remote sensing and GIS* (2nd ed.). Oxford University Press.
3. Bolstad, P. (2016). *GIS fundamentals: A first text on geographic information systems* (5th ed.). XanEdu Publishing.
4. Brewer, C. A. (2015). *Designing better maps: A guide for GIS users* (2nd ed.). Esri Press.
5. Chang, K.-t. (2015). *Introduction to geographical information system*. McGraw-Hill Education.
6. Harvey, F. (2015). *A primer of GIS: Fundamental geographic and cartographic concepts* (2nd ed.). The Guilford Press.
7. Jensen, J. R. (2013). *Remote sensing of the environment: An earth resource perspective*. Pearson Education India.
8. Joseph, G., & Jegannathan, C. (2018). *Fundamentals of remote sensing* (3rd ed.). Universities Press.
9. Lillesand, T. M., Kiefer, R. W., & Chipman, J. W. (2015). *Remote sensing and image interpretation* (7th ed.). Wiley.

Lesson Plan
PART III HONOURS UNDER 1+1+1 SYSTEM
July 2019-July 2020

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1-2	Hons	Social, Political, and Regional Geography	Concept of culture and its components with special emphasis on India (language, religion, and ethnicity)	Lecture, Discussion, Group Work, Visual Aids (slides, charts)	Class participation, Short quiz	2	SD Madam
Week 3	Hons	Social, Political, and Regional Geography	Social geography of rural India: caste structure and social stratification, focus on tribes like Santhals and Lepchas	Lecture, Case Studies, Group Discussions	Written assignment, Class participation	2	SD Madam
Week 4	Hons	Social, Political, and Regional Geography	Urban Social Geography: Social ecology and social space	Lecture, Urban Field Study, Visual Aids	Group project presentation	2	SD Madam
Week 5-6	Hons	Social, Political, and Regional Geography	Rural settlements: forms, site, and situations; Urban settlements: morphology and hierarchy	Lecture, Mapping Activity, Visual Aids	Mapping assignment, Quiz	2	SD Madam
Week 7-8	Hons	Social, Political, and Regional Geography	Concept of political geography and geopolitics; frontiers and boundaries	Lecture, Case Studies, Discussion	Class participation, Short quiz	2	RB Madam
Week 9	Hons	Social, Political, and Regional Geography	Cold War: Concepts of bi-polarisation and unipolarisation	Lecture, Multimedia Presentation, Discussion	Written assignment, Class participation	2	RB Madam
Week 10	Hons	Social, Political, and Regional Geography	Political geography of India: Administrative settings, problems of border states, and the geo-political implications of partition	Lecture, Group Discussions, Case Studies	Written exam, Class participation	2	RB Madam
Week 11-12	Hons	Social, Political, and	Concepts of regions: Basis of regionalization with reference to	Lecture, Group Work, Visual Aids	Class participation, Short quiz	2	SC Madam

		Regional Geography	India (physical, economic, and planning)				
Week 13-14	Hons	Social, Political, and Regional Geography	Physiographic Regions of India: Special reference to Kashmir Himalayas	Lecture, Mapping Activity, Field Study	Mapping assignment, Class participation	2	SC Madam
Week 14-15	Hons	Social, Political, and Regional Geography	Agricultural regions: Punjab-Haryana	Lecture, Case Studies, Group Discussions	Written assignment, Class participation	2	SC Madam
Week 15-16	Hons	Social, Political, and Regional Geography	Industrial regions: Mumbai-Pune industrial belt	Lecture, Multimedia Presentation, Discussion	Group project presentation	2	SC Madam
Week 16-18	Hons	Social, Political, and Regional Geography	Regional disparities in India: Causes and implications	Lecture, Group Discussions, Case Studies	Written exam, Class participation	2	SC Madam

Suggested Readings

1. Banerjee Guha, S. (Ed.). (2004). *Space, society and geography*. Rawat Publication.
2. Bjelland, M. D., Montello, D. R., Fellmann, J. D., Getis, A., & Getis, J. (2000). *Human geography: Landscape of human activity*. McGraw Hill.
3. Carter, H. (1995). *The study of urban geography* (4th ed.). Arnold.
4. Dhanagare, D. N. (2004). *Themes and perspectives in Indian sociology*. Rawat Publication.
5. Fern, R. L. (2002). *Nature, God and humanity*. Cambridge University Press.
6. Fouberg, E. H., Murphy, A. B., & de Blij, H. J. (2015). *Human geography: People, place, and culture* (11th ed.). Wiley.
7. Ghosh, S. (1998). *Introduction to settlement geography*. Sangam Books Ltd.
8. Gottdiener, M., Budd, M., & Lehtovuori, P. (2016). *Key concepts in urban studies* (2nd ed.). Sage.
9. Gregory, D., Johnston, R., Pratt, G., Watts, M., & Whatmore, S. (Eds.). (2009). *The dictionary of human geography* (5th ed.). Wiley.
10. Hudson, F. S. (1970). *Geography of settlements*. Macdonald and Evans Ltd.
11. Hussain, M. (2007). *Models in geography*. Rawat Publication.
12. Jordan, T., & Rowntree, L. (1990). *Human mosaic*. Harper Collins Publishers.
13. Knox, P., & Pinch, S. (2000). *Urban social geography*. Pearson Education.
14. Mandal, R. B. (2001). *Introduction to rural settlement* (2nd ed.). Concept Publishing Company.
15. Mitchell, D. (2000). *Cultural geography: A critical introduction*. Blackwell.
16. Singh, R. Y. (2000). *Geography of settlements*. Rawat Publication.

PAPER-VI: PHILOSOPHY OF GEOGRAPHY AND CONTEMPORARY ISSUES

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1-2	Geography Honours	Philosophy of Geography	1. Definition and nature of geography	Lectures, discussions, readings from key texts	Class participation, short quiz	4	AR Madam
Week 3	Geography Honours	Philosophy of Geography	2. Selected contributors to geographical thought	Lecture on Humboldt, Vidal de la Blache, Carl Sauer, David Harvey	Group presentation on contributors	2	AR Madam
Week 4	Geography Honours	Philosophy of Geography	3. Major postulates of geography: Determinism, Possibilism	Lecture and group discussions	Essay assignment	3	AR Madam
Week 5-6	Geography Honours	Philosophy of Geography	4. Changing approaches and methodologies in geography	Lecture with case studies, videos on Quantitative Revolution, etc.	Reflection paper on methodology	4	AR Madam
Week 7-8	Geography Honours	Contemporary Issues in Geography	1. Concept of hazards and disasters	Interactive lectures, group activities on hazard types	Case study analysis	4	RB Madam
Week 9	Geography Honours	Contemporary Issues in Geography	2. Climatic hazards: Floods, droughts, cyclones	Multimedia presentations, discussions	Quiz on climatic hazards	2	RB Madam
Week 10	Geography Honours	Contemporary Issues in Geography	3. Geomorphic hazards: Landslides, riverbank erosion	Field visit to a hazard-affected area, project work	Project report on geomorphic hazards	3	RB Madam
Week 11-12	Geography Honours	Contemporary Issues in Geography	4. Edaphic and biotic hazards: Deforestation, desertification	Workshops and presentations on local environmental issues	Group discussions and peer review	4	RB Madam
Week 13-14	Geography Honours	Contemporary Issues in Geography	1. Concept of the third world, development, and underdevelopment	Lectures, discussions on indicators of development	Short essay on third world challenges	4	SR Sir
Week 15-16	Geography Honours	Contemporary Issues in Geography	2. Problems of the third world	Group discussions, case studies	Presentation on a specific problem	4	SR Sir
Week 16-18	Geography Honours	Contemporary Issues in Geography	3. Globalization and sustainable development	Lecture and debates on globalization effects	Debate on globalization and sustainability	4	SR Sir

Week 16-18	Geography Honours	Contemporary Issues in Geography	4. Problems of urbanization	Urban field studies, discussions	Field report on urbanization issues	4	SR Sir

Suggested Readings

1. Adhikari, S. (2015). *Fundamentals of geographical thought*. Orient Blackswan.
2. Clifford, N., Holloway, S. L., Rice, S. P., & Valentine, G. (2009). *Key concepts in geography* (2nd ed.). Sage.
3. Couper, P. (2015). *A student's introduction to geographical thought: Theories, philosophies, methodologies*. Sage.
4. Cresswell, T. (2013). *Geographic thought: A critical introduction*. Wiley-Blackwell.
5. Dikshit, R. D. (2004). *Geographical thought: A contextual history of ideas*. Prentice Hall India.
6. Holt-Jensen, A. (2011). *Geography: History and concepts: A student's guide*. Sage.
7. Husain, M. (2015). *Evolution of geographical thought* (6th ed.). Rawat Publications.
8. Gregory, D., Johnston, R., Pratt, G., Watts, M., & Whatmore, S. (Eds.). (2009). *The dictionary of human geography* (5th ed.). Wiley.
9. Pete, P. (1998). *Modern geographical thought*. Wiley-Blackwell.

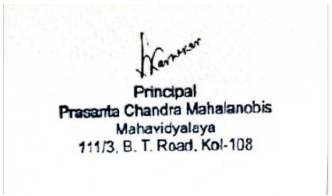
PAPER-VIII: STATISTICAL TECHNIQUES AND CONTEMPORARY ISSUES IN GEOGRAPHY (PRACTICAL)

Period	Hons/Programme Course	Paper Name and Paper Code	Topics	Methods and Materials	Methods of Evaluation	Number of Classes Allotted (in hours)	Name of the Teacher Assigned
Week 1	Geography Honours	Statistical Techniques and Contemporary Issues	1. Nature of statistical data: Discrete, continuous, parametric, and non-parametric	Lectures, discussions, readings	Class participation, short quiz	2	SC Madam
Week 2	Geography Honours	Statistical Techniques and Contemporary Issues	2. Tabulation and classification of data	Hands-on exercises, examples from datasets	Assignment on data classification	2	SC Madam
Week 3	Geography Honours	Statistical Techniques and Contemporary Issues	3. Frequency distribution: Histogram, frequency polygon, ogive, skewness	Practical sessions using software tools (e.g., Excel)	Quiz on frequency distribution concepts	2	SC Madam
Week 4	Geography Honours	Statistical Techniques and Contemporary Issues	4. Measures of central tendency: Mean, median, mode, quartile, decile, percentile	Lectures, group exercises, calculations	Classwork on central tendency calculations	2	SC Madam
Week 5	Geography Honours	Statistical Techniques and Contemporary Issues	5. Measures of dispersion: Mean deviation, quartile deviation, standard deviation, coefficient of variation	Practical exercises, software applications	Assignment on dispersion measures	2	AR Madam
Week 6	Geography Honours	Statistical Techniques and Contemporary Issues	6. Simple bivariate correlation and regression	Hands-on data analysis using statistical software	Project on correlation and regression analysis	2	AR Madam
Week 7	Geography Honours	Statistical Techniques and Contemporary Issues	7. Time series analysis	Practical examples, software application for time series	Report on time series analysis	2	AR Madam
Week 8	Geography Honours	Statistical Techniques and Contemporary Issues	8. Laboratory notebook and viva-voce (5+5 marks)	Review of laboratory work, oral questioning	Evaluation of laboratory notebook and viva-voce	2	AR Madam

Week 9	Geography Honours	Statistical Techniques and Contemporary Issues	Section A: Preparation and Interpretation of climatic and hydrological data	Preparation of climatic charts, hands-on practice	Assignment on climatic chart preparation	3	SD Madam
Week 10	Geography Honours	Statistical Techniques and Contemporary Issues	Section A: Preparation of station models for meteorological stations	Practical session on station model preparation	Evaluation of station models	2	SD Madam
Week 11	Geography Honours	Statistical Techniques and Contemporary Issues	Section A: Preparation and interpretation of rating curves, hydrographs, and unit hydrographs	Practical analysis using hydrographic data	Report on hydrographs and interpretation	3	SD Madam
Week 12	Geography Honours	Statistical Techniques and Contemporary Issues	Section B: Computation of Human and Gender Development Index	Data analysis, use of HDI and GDI calculation tools	Presentation on HDI and GDI calculations	2	SR Sir
Week 13	Geography Honours	Statistical Techniques and Contemporary Issues	Section B: Preparation of questionnaire schedule for development assessment	Workshop on questionnaire design	Assessment of questionnaire schedules	2	SR Sir
Week 14	Geography Honours	Statistical Techniques and Contemporary Issues	Section B: Measures of spatial and size-class distribution	Practical exercises, examples from spatial data	Assignment on spatial distribution measures	3	SR Sir
Week 15	Geography Honours	Statistical Techniques and Contemporary Issues	Section B: Dominant-distinctive function, Rank-size rule, Lorenz curve	Group discussions, practical applications	Group presentation on spatial measures	3	SR Sir
Week 16	Geography Honours	Statistical Techniques and Contemporary Issues	7. Laboratory Notebook and viva-voce	Review of laboratory work and oral assessments	Evaluation of laboratory notebook and viva-voce	2	SR Sir

Suggested Readings

1. Acevedo, M. F. (2012). *Data analysis and statistics for geography, environmental science and engineering*. CRC Press.
2. Harris, R., & Jarvis, C. (2011). *Statistics for geography and environmental science*. Prentice Hall.
3. McGrew Jr., J. C., Lembo Jr., A. J., & Monroe, C. B. (2014). *An introduction to statistical problem solving in geography* (3rd ed.). Waveland Press.
4. Pal, S. K. (1998). *Statistics for geoscientists: Techniques and applications*. Concept Pub Co.
5. Rogerson, P. A. (2015). *Statistical methods for geography: A student's guide* (4th ed.). Sage.
6. Sarkar, A. (2015). *Practical geography: A systematic approach* (3rd ed.). Orient Blackswan.



Prasanta Chandra MahalanobisMahavidyalaya

Lesson Plan- 2019-20

Semester I Honors. &Programme Course

Name of the Department: ECONOMICS ODD SEM CBCS

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
September-November	**Hons.**	**ECOACOR01T**	UNIT-1 Why study economics? Scope and method of economics; the economic problem: scarcity and choice; Distinction between Microeconomics and Macroeconomics; the question of what to produce, how to produce and how to distribute output;the basic competitive model; prices, UNIT4:Production and Cost Production function, Total, Average and Marginal products, Isoquants and economic regions of production, Cost minimization and expansion path, Elasticity of substitution, Economies of scale, Cobb Douglas, Fixed coefficient and CES functions, Short run and long run costs, Derivation of the cost function from production function	Ict classroom, YouTube lecturevideo, Offline methods with chalk and duster	Offline Internal examinations Two examinations 10 marks each	10 12	SS SBC

September-November		**ECOACOR02T**	UNIT- 1 Preliminaries Concept: Sets and set operations; relations; functions and their properties; number systems. Set Theory: Definition of a set and discussion of related concepts; Set types; Operations on sets; Nested sets; Cartesian product; Concept of Euclidean Space Functions and Relations: Definitions; Concepts of 'range', 'domain' and 'mapping'; Explicit and implicit functions; Types of functions and correspondences (polynomial, exponential, logarithmic, power) UNIT 3 .Simultaneous Linear Systems and Related Applications of Matrix Algebra: (12 hours) Vector spaces: algebraic and geometric properties, scalar products, norms, orthogonality; linear transformations: properties, matrix representations and elementary operations; systems of linear equations: properties of their solution sets; determinants: characterization, properties and applications. UNIT- 6 Free and constrained optimization; Examples of constrained optimization from consumer and producers theories; Static and dynamic optimization problems; applications Applications: Equilibrium under cardinal and ordinal utility theory; Maximization of Profit in different market form, Minimization of cost of production in long run.	Ict classroom, YouTube lecturevideo, Offline methods with chalk and duster	Offline Internal examinations Two examinations 10 marks each	10 15 15	SS PB SBC
September-November	**Programme Course**		UNIT-3 Producers'BehaviourConcept of Production- Factors of Production-Production Function: Concepts of TP, AP and MP. Derivation of AP and MP curve graphically from TP curve- Law of Variable Proportions- Isoquants and its Properties- Expansion Path-Laws of Returns to Scale. Concepts of Revenue- TR, AR, MR. Derivation of AR and MR curve from TR curve – Relation concerning AR, MR and Elasticity of Demand. UNIT- 1 Basic Concepts: (10 hours) What is economics? Scope and method of economics; the economic problem: scarcity and choice; Distinction between Microeconomics and Macroeconomics; Concept of Market, Demand & Supply – Market	Ict classroom, YouTube lecturevideo, Offline methods with chalk and duster	Offline Internal examinations Two examinations 10marks each	15 10	SBC SS

			equilibrium. Elasticity of Demand : Price elasticity of DemandFactors affecting the price elasticity of demand-Measurement of point price elasticity of demand and Arc elasticity- Income elasticity of demand. UNIT- 2Consumers' Behaviour (15 hours) Marginal Utility- Law of Diminishing Marginal Utility- Derivation of demand curve from marginal utility curve- Consumers' surplus. Indifference curve: Definition and Characteristics – Budget line –Consumers'Equlibrium Income effect and Substitution effect- Graphical presentation to show Price effect is the summation of Income effect and Substitution effect- Inferior goods and Giffen goods.			15	PB
December-January	**Hons.**	**ECOACOR01T**	UNIT -2. Supply and Demand: How Markets Work, Markets and Welfare (12 hours) Markets and competition; determinants of individual demand/supply; demand/supplyschedule and demand/supply curve; market versus individual demand/supply; shifts in thedemand/supply curve, demand and supply together; how prices allocate resources;elasticity and its application; controls on prices; taxes and the costs of taxation; consumersurplus; producer surplus and the efficiency of the markets. UNIT-3 The Household The consumption decision - budget constraint, consumption and income/price changes, demand for all other goods and price changes; description of preferences (representingpreferences with indifference curves); properties of indifference curves; consumer'soptimum choice; income and substitution effects (Hicks &Slutsky); Ordinary and Compensated demand curves, Inferior goods and Giffen goods, Price consumption and income consumption curves UNIT -5. Market Structure Different types of market structures- Perfect competition, Monopoly, Monopolistic Competition and Oligopoly	Ict classroom, YouTube lecturevideo, Offline methods with chalk and duster	Offline Internal examinations Two examinations 10 marks each	12 10 30	SS SBC PB

December-January	**Hons**	**ECOACOR02T**	UNIT-2'integral' (stress on both intuitive and mathematical understanding); differentiable functions: Applications of differential and integral calculus to Brief Review of Differential and Integral Calculus: Concepts of 'limits and continuity', 'derivative', 'partial derivative', 'total differential' and the study of functions: level curves; slope and curvature of functions, area under a curve etc. second and higher order derivatives: properties and applications. Applications: Expenditure function and its properties; Shepherd's Lemma; Indirect Utility Function; Roy's Identity; Slutsky equation and decomposition of price effect; Properties of demand functions. Work-leisure choice; savings function, Total average and marginal Cost & Production, saving & investment function Consumption function, UNIT-6 Multi-variable optimization Free and constrained optimization; Examples of constrained optimization from consumer and producers theories; Static and dynamic optimization problems; applications Applications: Equilibrium under cardinal and ordinal utility theory; Maximization of Profit in different market form, Minimization of cost of production in long run	Ict classroom, YouTube lecturevideo, Offline methods with chalk and duster	Offline Internal examinations Two examinations 10 marks each	15 15	SBC PB
December-january	**Programme Course**	ECOGCOR01T	UNIT-4 Market Structure: Perfect Competition ,Characteristics of Perfectly Competitive Market. Short –run and Long-run equilibrium of Perfectly Competitive firm and industry. UNIT-6 Market Structure: Imperfect Competition Concept and Characteristics of Monopoly Market – Degree of Monopoly Power. Monopolistic competition and Oligopoly - Features and example UNIT-6 6. Theory of Distribution (15 hours) (i) Marginal Productivity Theory of Distribution (ii) Rent : (a) Ricardian Theory , (b) Modern Theory , (c) Quasi- Rent. (iii) Wage: Marginal Productivity Theory of Wages – Role of Trade UnioninWageDetermination under Competitive Set up. (iv) Interest: Real and Monetary Interest	Ict classroom, YouTube lecturevideo, Offline methods with chalk and duster	Offline Internal examinations Two examinations 10 marks each	10 10 15	SBC PB SS

			Rate – Lonable Fund Theory of Interest Rate – Liquidity Theory of Interest Rate. (v) Profit: Gross Profit and Net Profit – Difference Between Profit and Other Factor Incomes (concepts only)				

Recommended Text books:

Suggested Readings:
K. Sydsaeter and P. Hammond, *Mathematics for Economic Analysis*, Pearson Educational Asia: Delhi, 2002. ECOACORO1T:

Blume, Lawrence and Carl Simon (1994), *Mathematics for Economists*, Norton. Chiang, Alpha and Kevin Wainwright (2005), *Fundamental Methods of Mathematical Economics*, Fourth Edition, McGraw-Hill

Baldani, Bradfield and Turner, An Introduction to *Mathematical Economic*, CengageLeaening: 2007.

ECOACOR02T. Suggested Readings:
K. Sydsaeter and P. Hammond, *Mathematics for Economic Analysis*, Pearson Educational Asia: Delhi, 2002.

Blume, Lawrence and Carl Simon (1994), *Mathematics for Economists*, Norton. Chiang, Alpha and Kevin Wainwright (2005), *Fundamental Methods of Mathematical Economics*, Fourth Edition, McGraw-Hill

Baldani, Bradfield and Turner, An Introduction to *Mathematical Economic*, CengageLeaening:

INTERNAL EXAMINATIONS

SEMESTER I GE+DSE:,will be on 4th week of August,3rd week of November 2019

SEMESTER III GE+DSE: will be on 2nd week of September,1st week of November 2019

TEST EXAMINATION

3RD YEAR BSC GENERAL: will be on 1ST week of January 2020

No honours students in semestrer 1 3,5, Honours Course.

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Lesson Plan- 2019-20

Semester III Honors. &Programme Course

Name of the Department: ECONOMICS ODD CBCS

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
August-September	**Programme Course**	ECOGCORO3T	UNIT-2, Development Planning & its necessity Balanced vs. Unbalanced growth. Complementary Roles of Agriculture and Industry - Role of Technology in Agriculture and Industry. UNIT-4 Concept and Role of Domestic Capital Formation in an Underdeveloped Country: The Problems -Incentives for Savings and Investment. UNIT-1 . Basic Concepts of Development: Meaning of growth and development, Distinction between Economic Growth and Economic DevelopmentGrowthindicators-NNI and PCI, Concept and formulation of HDI.	Ict classroom, YouTube lecturevideo, Offline methodswith chalk and duster	Offline Internal examinations Two examinations10 marks each	15 10 15	SBC SS PB
November-january	**Programme Course**	ECOGCORO3T	UNIT- 3 Population and Economic Development: The Two Way Relation. UNIT -5 Foreign Investment: Different forms - Their roles in Economic Development UNIT -6.Role of International Institutions:IMF & World Bank in economic development of the LDCS UNIT-7 . Gender Related Issues concept of GDI & instances of Gender Discrimination in the society	Ict classroom, YouTube lecturevideo, Offline methodswith chalk and duster	Offline Internal examinations Two examinations 10 marks each	10 8 8	PB SS PB

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Lesson Plan- 19-20

Semester V Honors. &Programme Course

Name of the Department: ECONOMICS (1+1+1) SYSTEM

Period	Hons/ Programme Course	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
July to December	**Programme Course 1+1+1 system** DEVELOPMENT ECONOMICS &STATISTIC PAPER IV	UNIT-1 Variable, Attribute, Primary and Secondary Data, Population and Sample, Census and Sample Survey, Classification of data and Tabulation. UNIT 2Frequency Distributions : Frequency distribution of an Attribute, Frequency distribution of a discrete variable, Frequency distribution of a continuous variable, Construction of Frequency distribution from raw data, Cumulative Frequency distribution UNIT-3.Charts and Diagrams : Meaning and functions of Graphs – Types of Charts and Diagrams – Line Diagram, Bar Diagram, Pie Diagram, Pictogram, Statistical Map, Frequency Polygon, Histogram, Step Diagram, Ogive or Cumulative Frequency Polygon, Frequency Curve UNIT4.Measures of Central Tendency: Arithmetic Mean (AM), Geometric Mean (GM), Harmonic Mean (HM), Median, Mode (Definitions, formulae and simple numerical problems). UNIT-5 Measures of Dispersion: Meaning and necessity, Range, Quartile Deviation (QD), Mean Deviation (MD), Standard Deviation (SD), Coefficient of Variation(CV),(Concepts only.	Ict classroom, YouTube lecture video, Offline methodswith chalk and duster	Offline Test examinations Of 100 marks	15 10 15	PB SS PB
January To June	**Programme Course 1+1+1 system**	1. Basic Concepts of Development: Meaning of growth and development, Distinction between Economic Growth and Economic		Offline Test examinations Of 100 marks	15	SBC

	DEVELOPMENT ECONOMICS &STATISTIC PAPER IV	DevelopmentGrowth indicators-NNI and PCI, Concept and formulationof HDI . 2. Development Planning & its necessity Balanced vs. Unbalanced growth. Complementary Roles of Agriculture and Industry -Role of Technology in Agriculture and Industry. 3. Population and Economic Development -- The Two Way Relation. 4. Concept and Role of Domestic Capital Formation in an Underdeveloped Country: The Problems -Incentives for Savings and Investment. 2. International trade and economic developmentIMF & World Bank in economic development of the LDCS			15	SB C

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Lesson Plan- 19-20

Semester II Honors. &Programme Course

Name of the Department: __ECONOMICS EVEN SEMESTER CBCS

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
March-April	**Hons.**	**ECOACOR O3T**	**UNIT 1 Introduction to Macroeconomics and National Income Accounting** Basic issues studied in macroeconomics ;measurementofgrossdomestic product; income,expenditureandthecirc ular flow; different methods of calculating NI; measurement of costof living – CPI, GDP deflator; measuring joblessness – Unemployment rate,Unemployment and GDP – Okun's Law; national income accounting for an open economy; balance of payments: current and capital accounts; NI as a measure of economic welfare	0ffline method is used using board Chalk duster ICT classes, you tube lecture videos Special lectures seminars	Offline evaluation of Internal examinations	10	PB
			UNIT2. Money Functions of money; quantity theory of money; determination of money supply and demand; credit creation; tools of monetary policy			9	SS
			UNIT4. The Closed Economy in the Short Run Classical and Keynesian systems (difference in concepts Simple Keynesian model o f income determination,			7	SBC
						.	

	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
March-April	**Hons**	**ECOACORO4T**	**UNIT2. Measures of Central tendency** The mean, median, mode; geometric mean, harmonic mean, their relative merits and demerits **UNIT7. Time series** Components, measurement of trend and statistical fluctuations; Two variable linear curve fitting analysis - estimation of regression lines (Least square method) and regression coefficients - their interpretation and properties, standard error of estimate **UNIT4. Measures of Skewnessand Kurtosis : Interpolation and Extrapolation** **UNIT1. Basic concepts**: Population and sample, parameter and statistic; Data Collection: primary and secondary data, methods of collection of primary data; Presentation of Data: Univariatefrequency distribution; cumulative frequency; graphic and diagrammatic representation of data.	0ffline method is used using board Chalk duster ICT Classes, you tube lecture videos Special lectures seminars.	Offline evaluation of Internal examinations	5 8 5 8	PB SS SS SBC
May-June	**Hons.**	**ECOACORO3T INTRODUCTORY MACROECONOMICS**	**UNIT3. Inflation** Inflation and its social costs; Demand Pull and Cost Push inflation; hyperinflation; antiinflationary Policies	0ffline method is used using board Chalk duster	Offline evaluation of Internal examinations	10	PB

			UNIT 4 Multipliers, ISLM model; fiscal and Monetary multipliers.	ICT classes, U tube lecture videos Special lectures seminars		10	SBC
Period	**Hons/ Programme Course**	**Paper Name and Paper Code**	**Topics**	**Methods and materials**	**Methods of Evaluation**	**Number of classes allotted in hours**	**Name of the Teacher assigned**
May-June		**ECOACORO4T**	**UNIT 3 Measures of Dispersion**: absolute and relative - range, mean deviation, standard deviation, coefficient of variation, quartile deviation, their merits and demerits **UNIT8. Index Numbers** Price, quantity Index Numbers: Index number as weighted averages, Price and quantityindex numbers, Problems in the Construction of Index Numbers, Tests for index Numbers, Chain based Index, Cost of Living Index Number, Wholesale Price Index and Cost of Living Index, Uses of Index Numbers, Index numbers as indices of wellbeing, Stock market indices. **UNIT 7. Time series** Components, measurement of trend and statistical fluctuations; Two variable linear curvefitting analysis - estimation of regression lines (Least square method) and regression coefficients -theirinterpretation and properties, standard error of estimate **UNIT5. Bivariate frequency distribution:** Simple	0ffline method is used using board Chalk duster ICT classes, you tube lecture videos Special lectures seminars	Offline evaluation of Internal examinations	10 I0 8	PB PB SS

			Correlation: scatter diagram, sample correlation coefficient - Karl Pearson‟s correlation coefficient and itsproperties, probable error of correlation coefficient, Spearman's rank correlation coefficient, partial and multiple correlation, Regression Analysis: Properties of linear regression, explained and unexplained variation regression in bivariate frequency distribution. **UNIT9. Vital Statistics** Measures of crude birth rate, death rate, age sex specific birth anddeath rates; infant mortality rate; construction and use of life table. [Note: Values in parentheses indicate number of Lecture hours for the corresponding unit]			4 10 5	SS SBC SBC

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Lesson Plan- 2019-20

Semester II Honors. &Programme Course

Name of the Department: ECONOMICS_EVEN SEMESTER

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
March-April	**Programme Course ECONOMICS GENERAL**	**(ECOGCOR02T)**	**UNIT1. National Income** National Incomeand its measurement- different methods and their drawbacks; GDP and GNP; Difference between Nominal and real GNP/GDP; GNP/GDP as a true index of Nation's welfare; concept of HDI. **UNIT 2. Macro economic theories**(i) Classical Macro economic theory and Keynesian Theory (concepts and historical background, how they are different) **UNIT 3 Money and banking**(i) Functions of Money – Value of Money Different Concepts of Money : M1, M2, M3 and M4	0ffline method is used using board Chalk duster ICT classes, you tube lecture videos Special lectures seminars	Offline evaluation of Internal examinations	20 10 20	PB SBC SS
		(ECOHGEC04T)	**UNIT1. Structure of IndianEconomy:**Sectoral distribution of National Income and its	0ffline method is used using board	Offline evaluation of Internal examinations	12	SBC

			change since inception of Planning.Occupational pattern in India-A trend analysis since 1901.Inequalities in Income distribution. Economic reforms and reduction of poverty; Poverty eradication programmesand their effectiveness. Structure and quality if employment in India; Government undertaken different schemes to reduce unemployment and underemployment. **UNIT 2. Human resources and economy** Size and growth rate of population in India. Changes in sex composition since inception of planning.Population policy and population projections for India. **development**: **UNIT3. Agriculture**: Causes for low productivity. Targetedpublic distribution system.New agricultural policy; Green revolution and its prospects Land reforms and its appraisal. Effects of GATT on Indian Agriculture.	Chalk duster ICT classes, you tube lecture videos Special lectures seminars		10 15	SS PB

		ECOGDSE03T)	**UNIT1. Nature and Scope of Public Economics** Definition and Scope of Public Economics; Externalities, Market Failure and Government Intervention. **UNIT 3. Taxation** Classification of Taxes; Canons of Taxation; Benefit Principle; Ability to Pay Principle; Incidence and Burden of Taxes. **UNIT 4. Public Expenditure and Public Debt** Meaning and Classification of Public Expenditure; government budget and its types; Sources of revenue of Central and State governments in India	0ffline method is used using board Chalk duster ICT classes, you tube lecture videos Special lectures seminars	Offline Internal examinations evaluation of Internal examinations	5 10 10	SS SBC PB
May-June		**ECOGCOR02T**	**UNIT 2. Macro economic theories**(ii) Simple Keynesian Model (SKM) of Income Determination-Consumption Function – Relation between Average and Marginal Propensity to Consume - Multiplier Theory **UNIT 3 Money and banking** (ii) Concepts of Bank and Non-bank Financial Intermediaries – Functions and Credit Creation of Commercial Banks – Central Bank-Functions and Credit Control Measures **UNIT 4. Inflation** Concepts of Inflation, Deflation and	0ffline method is used using board Chalk duster ICT classes, you tube lecture videos Special lectures seminars	Offline evaluation of Internal examinations	10 10 15	SBC SS PB

			Stagflation – Inflationary Gap – Distinction between Demand Pull and Cost Push Inflation- Effects of Inflation – Anti-inflationary Fiscal and Monetary Policies.				
		(**ECOHGEC04T)**	**UNIT 5.Banking**: Role of Indian Commercial Banks and Reserve Bank of India.Monetary Policy of the Reserve Bank of India.Profitability of banks in India. **UNIT 4. Industry** Review of Industrial growth under planning. Role of small-scale industries and policy perspective to help them.Role of trade union and social security measures in India.: **UNIT 6. Indian Public Finance** Sources of Revenue and Expenditure of Union and State Government.Union-State Financial Relation.Centre-State Conflict on Finances. **UNIT7. Foreign trade** Volume and direction of India's foreign trade in the post-Liberalization period	0ffline method is used using board Chalk duster ICT classes, you tube lecture videos Special lectures seminars	Offline evaluation of Internal examinations	10 10 10 5	PB SBC SS SS

PART III IS (1+1+1) SYSTEM DURING MARCH –APRIL AND MAY- JUNE NO CLASSES ARE ALLOTED

Recommended Text books:

ECOGCOR02T 1. Gupta , S.B – Monetary Economics , S.Chand& Co. , New Delhi 2. Ahuja , H.L - Macroeconomics 3. Mukherjee ,Debes – Essentials of Micro and Macroeconomics, New Central Book Agency (P) Ltd.

(**ECOHGEC04T)** 1. Dutta R. and K.P.M. Sundaram: Indian Economy, S. Chand and Co. New Delhi 2. Misra S.K.V. K. Puri: Indian Economy, Himalayas Publishing Co. Mumbai. 3. Agarwal A.N: Indian Economy, Vikash Publishing Co. Delhi 4. Gupta, S.B.: Monetary Planning in India, Oxford University Press, Delhi.

ECOGDSE03T 1. J. Hindriks, G. Myles: Intermediate Public Economics, MIT Press, 2006. 2. J. E. Stiglitz, Economics of the Public Sector, W.W. Norton & Company, 3rd edition, 2000. 3. R.A. Musgrave and P.B. Musgrave, Public Finance in Theory &Practice,McGraw Hill Publications, 5th edition, 1989. 4. J. F. Due and A. F. Friedlander. Government Finance-Economics of Public Sector, AITBS Publishers and Distributors, 1994 10. A Ghosh and C. Ghosh, Public Finance, Prentice Hall India Learning Private Limited; 2nd Revised edition (2014)

. **ECOSSEC02M**

1. M. R. Saluja: Indian Official Statistical Systems. 2. CSO (MOSPI) Publication: Statistical System in India. 3. United Nations publications 4. RBI: Handbook of Statistics for the Indian Economy (various years) 5. Economic Survey, Govt. of India, Ministry of Finance (various years) 6. R. Ramkumar: Technical Demography. 7. K. Srinivasan: Demographic Techniques and Applications. 8. B. D. Mishra: An Introduction to the Study of Population. 9. H. S. Shryock: The Methods and Materials in Demography

NO INTERNAL EXAMS HELD IN 2019-20 EVEN SEMESTER DUE TO COVID 19

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Lesson Plan- 2019-20

Semester I Honors. & Programme Course

Name of the Department: MATHEMATICS

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
September-December	**Hons.**	**01T**	Hyperbolic functions, higher order derivatives, Leibnitz rule and its applications to problems of type , (ax+b)^n sinx, (ax+b)^n cosx, concavity and inflection points, envelopes, asymptotes, curve tracing in Cartesian coordinates, tracing in polar coordinates of standard curves, L'Hospital's rule, applications in business, economics and life sciences.	Chalk and Duster, PDF, Group Discussion	Assignment	16	Dr. Trisha Maitra
		01T	Unit 2: Reduction formulae, derivations and illustrations of reduction formulae for the integration of trignometric functions, parametric equations,	Chalk and Duster, PDF, Group Discussion	Assignment	25	Mrs. Neha Ghorui (Mundhra)

			parametrizing a curve, arc length, arc length of parametric curves, area of surface of revolution. Techniques of sketching conics. Unit -3: Reflection properties of conics, translation and rotation of axes and second degree equations, classification of conics using the discriminant, polar equations of conics. Spheres. Cylindrical surfaces. Central conicoids, paraboloids, plane sections of conicoids, Generating lines, classification of quadrics, Illustrations of graphing standard quadric surfaces like cone, ellipsoid.				
		01T	Differential equations and mathematical models. General, particular, explicit, implicit and singular solutions of a differential equation. Exact differential equations and integrating factors, separable equations and	Chalk and Duster, PDF, Group Discussion	Assignment	16	Ms. Piyali Saha

			equations reducible to this form, linear equation and Bernoulli equations, special integrating factors and transformations				
		02T	Unit 1: Polar representation of complex numbers, n-th roots of unity, De Moivre's theorem for rational indices and its applications. Theory of equations: Relation between roots and coefficients, Transformation of equation, Descartes rule of signs, Cubic (Cardan's method) and biquadratic equations (Ferrari's method). Inequality: The inequality involving AM≥GM≥HM, Cauchy-Schwartz inequality.	Chalk and Duster, PDF, Group Discussion	Assignment	20	Neha Ghorui Mundhra
		02T	Unit -2: Equivalence relations and partitions, Functions, Composition of functions, Invertible functions, One to one correspondence and cardinality of	Chalk and Duster, PDF, Group Discussion	Assignment	36	Dr. Trisha Maitra

			a set. Well-ordering property of positive integers, Division algorithm, Divisibility and Euclidean algorithm. Congruence relation between integers. Principles of Mathematical Induction, statement of Fundamental Theorem of Arithmetic. Unit -3: Systems of linear equations, row reduction and echelon forms, vector equations, the matrix equation Ax=b, solution sets of linear systems, applications of linear systems, linear independence.				
		02T	Unit 4: Matrix, inverse of a matrix, characterizations of invertible matrices. Rank of a matrix, Eigen values, Eigen Vectors and Characteristic Equation of a matrix. Cayley-Hamilton theorem and its use in finding the inverse of a matrix.	Chalk and Duster, PDF	Assignment	20	Ms. Piyali Saha

September-December	**Programme Course**	**01T**	Limit and Continuity (ε and δ definition), Types of discontinuities, Differentiability of functions, Successive differentiation, Leibnitz's theorem, Partial differentiation, Euler's theorem on homogeneous functions.	Chalk and Duster, PDF	Assignment	17	Ms. Piyali Saha
		01T	Tangents and normals, Curvature, Asymptotes, Singular points, Tracing of curves. Parametric representation of curves and tracing of parametric curves, Polar coordinates and tracing of curves in polar coordinates.	Chalk and Duster, PDF	Assignment	15	Mrs. Neha Ghorui Mundhra
		01T	Rolle's theorem, Mean Value theorems, Taylor's theorem with Lagrange's and Cauchy's forms of remainder, Taylor's series, Maclaurin's series of sin x, cos x, e x , log(l+x), (l+x)n ,	Chalk and Duster, PDF	Assignment	15	Dr. Trisha Maitra
January-March	**Hons.**	**03T**	Unit-1: Review of Algebraic and Order Properties of $\mathbb{R}$, ε-neighbourhood of a point in $\mathbb{R}$. Idea of countable sets,	Chalk and Duster, PDF	Assignment	18	Mrs. NehaGhorui(Mundhra)

			uncountable sets and uncountability of $\mathbb{R}$. Bounded above sets, Bounded below sets, Bounded Sets, Unbounded sets. Suprema and Infima.Completeness Property of $\mathbb{R}$ and its equivalent properties. The Archimedean Property, Density of Rational (and Irrational) numbers in $\mathbb{R}$, Intervals. Limit points of a set, Isolated points, Open set, closed set, derived set, Illustrations of Bolzano-Weierstrass theorem for sets, compact sets in $\mathbb{R}$, Heine-Borel Theorem				
		03T	Unit-2 : Sequences, Bounded sequence, Convergent sequence, Limit of a sequence, liminf, lim sup. Limit Theorems. Monotone Sequences, Monotone Convergence Theorem. Subsequences, Divergence Criteria. Monotone Subsequence Theorem	Chalk and Duster, PDF	Assignment	18	Ms. Piyali Saha

			(statement only), Bolzano Weierstrass Theorem for Sequences. Cauchy sequence, Cauchy's Convergence Criterion.				
		03T	Infinite series, convergence and divergence of infinite series, Cauchy Criterion, Tests for convergence: Comparison test, Limit Comparison test, Ratio Test, Cauchy's nth root test, Integral test. Alternating series, Leibniz test. Absolute and Conditional convergence.	Chalk and Duster, PDF	Assignment	18	Dr. Trisha Maitra
		04T	Unit-1: Lipschitz condition and Picard's Theorem (Statement only). General solution of homogeneous equation of second order, principle of super position for homogeneous equation, Wronskian: its properties and applications, Linear homogeneous and non-homogeneous equations of higher order with constant coefficients, Euler's equation, method of undetermined	Chalk and Duster, PDF	Assignment	25	Dr. Trisha Maitra

			coefficients, method of variation of parameters. Unit -2: System of linear differential equations, types of linear systems, differential operators, an operator method for linear systems with constant coefficients, Basic Theory of linear systems in normal form, homogeneous linear systems with constant coefficients: Two Equations in two unknown functions.				
		04T	Unit-3: Equilibrium points, Interpretation of the phase plane, Power series solution of a differential equation about an ordinary point, solution about a regular singular point.	Chalk and Duster, PDF	Assignment	15	Ms. Piyali Saha
		04T	Unit- 4: Triple product, introduction to vector functions, operations with vector-valued functions, limits and continuity of vector functions, differentiation and integration of vector functions.	Chalk and Duster, PDF	Assignment	15	Mrs. Neha Ghorui Mundhra

	Programme Course	**02T**	First order exact differential equations. Integrating factors, rules to find an integrating factor. First order higher degree equations solvable for x, y, p. Methods for solving higher-order differential equations. Basic theory of linear differential equations, Wronskian, and its properties. Solving a differential equation by reducing its order.	Chalk and Duster, PDF	Assignment	8	Mrs. NehaGhorui(Mundhra)
		02T	Linear homogenous equations with constant coefficients, Linear non-homogenous equations, The method of variation of parameters, The Cauchy-Euler equation, Simultaneous differential equations, Total differential equations	Chalk and Duster, PDF	Assignment	6	Dr. Trisha Maitra
		02T	Order and degree of partial differential equations, Concept of linear and non-linear partial differential equations, Formation of first order partial	Chalk and Duster, PDF	Assignment	8	Ms. Piyali Saha

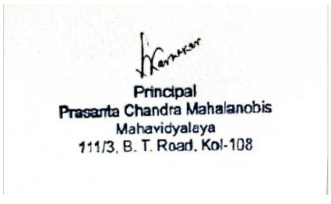
			differential equations, Linear partial differential equation of first order, Lagrange's method, Charpit's method. Classification of second order partial differential equations into elliptic, parabolic and hyperbolic through illustrations only.				

Recommended Text books:

- K.B. Dutta, Matrix and linear algebra.
- K. Hoffman, R. Kunze, Linear algebra.
- S.K. Mapa Higher Algebra Abstract and Linear
- S.K. Mapa Classical Algebra
- Gerald G. Bilodeau, Paul R. Thie, G.E. Keough, An Introduction to Analysis, 2nd Ed., Jones & Bartlett, 2010.
- Vector Analysis - Spiegel (Schaum)
- Vector Calculus - C. E. Weatherburn

Programme Course:

- H. Anton, I. Birens and S. Davis, Calculus, John Wiley and Sons, Inc., 2002
- Shepley L. Ross, Differential Equations, 3rd Ed., John Wiley and Sons, 1984



Prasanta Chandra Mahalanobis Mahavidyalaya

OLD SYLLABUS (1+1+1)

Name of the Department: MATHEMATICS

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
July-December	**3rd year Hons Course**	**Paper- V Group-A Real Analysis- II**	Linear Point Set: Covering by open intervals. Sub-covering. Cantor intersection theorem.' Lindelof-covering theorem (statement only). Compact sets. Heine-Borel Theorem and its converse. Functions defined on point sets in one dimension: Limit and continuity. Continuity on compact set. Uniform continuity on compact set. Inverse function. Continuous image of compact set is compact. Sequence of functions defined on a set (Ì R): Pointwise and uniform convergence. Cauchy criterion of uniform convergence. Dini's theorem on uniform convergence. Weierstrass' M-test. Limit function: Boundedness. Repeated limits. Continuity. Integrability	Chalk and Duster, PDF	Assignment	40	Mrs. Neha Ghorui Mundhra

			and differentiability of the limit function of a sequence of functions in case of uniform convergence. b) Series of functions defined on a set: Pointwise and uniform convergence. Cauchy criterion of uniform convergence. Dini's theorem on uniform convergence. Tests of uniform convergence -Weierstrass' M-test. Statement of Abel's and Dirichlet's test and their applications. Passage to the limit term by term. Sum function: boundedness, continuity, integrability, differentiability of a series of functions in case of uniform convergence. c) Power Series (P.S.): Fundamental theorem of Power Series				
			Power Series (P.S.): Fundamental theorem of Power Series. Cauchy-Hadamard theorem. Determination of radius of convergence. Uniform and absolute convergence of P.S. Properties of sum function. Abel's limit theorems. Uniqueness of power	Chalk and Duster, PDF	Assignment	50	Piyali Saha

			series having same sum function. Exponential, logarithmic and trigonometric functions defined by Power Series and deduction of their salient properties. Function of two variables: Mean value theorem and Taylor's theorem. b) Extremum of functions of two and three variables: Lagrange's Method of undetermined multipliers. Riemann Integration for bounded functions: Partition and refinement of partition of an interval. Upper Darboux sum U(P, f) & Lower Darboux sum L (P, f) and associated results. Upper Riemann (Darboux) integral and Lower Riemann (Darboux) integral. Darboux's theorem. Necessary and sufficient condition of R-integrability. Classes of Riemann Integrable functions: Monotone functions, continuous functions, piecewise continuous functions with (i) finite number of points of discontinuities, (ii)				

			infinite number of points of discontinuities having finite number of accumulation points. Riemann Sum : Alternative definition of integrability. Equivalence of two definitions (statement only). Integrability of sum, product, quotient, modulus of R-integrable functions. Sufficient condition for integrability of composition of R-. integrable functions. Properties of Riemann integrable functions arising from the above results. Function defined by definite integral and its properties. Primitive or Indefinite Integral. Properties of definite integral. Definition of log x ($x > 0$) as an integral and deduction of simple properties including its range. Definition of e and its simple properties. Fundamental theorem of Integral Calculus. First Mean Value Theorem of Integral Calculus. Statements and applications of Second Mean Value Theorem of Integral Calculus (both Bonnett's form and				

			Weierstrass form) Theorem on method of substitution for continuous functions. Improper Integral: Range of integration, finite or infinite. Necessary and sufficient condition for convergence of Improper Integral in both cases. Tests of convergence: Comparison and μ-Test. Absolute and non absolute convergence - Corresponding Tests. Beta and Gamma functions - their convergence and inter-relations. Statement of Abel's and Dirichlet's Tests for convergence of the integral of a product. Uniform convergence of Improper Integral by M-Test. (Definite Integral as a function of a parameter: Differentiation and Integration with respect to the parameter under integral sign – Statements (only) of some relevant theorems and simple problems. Concept on function of Bounded Variation (BV): Monotonic function is of BV. If f be of BV on [a, b], then f is bounded on [a. b]. Examples of				

			functions of BV which are not continuous and continuous functions not of BV. Statement of a necessary and sufficient condition for a function f to be of BV on [a, b] is that fcan be written as the difference of two monotonic increasing functions on [a, b] Rectification of Plane Curves: Definition of Rectifiable Curve. A plane curve v = (f, g) is rectifiable if and only if f and g be both of bounded variation (Statement only). Simple examples on determination of length of curves. Determinations of intrinsic equation of a curve. Fourier Series: Trigonometric Series. Fourier co-efficients. A periodic function of bounded variation can be expressed as a Fourier series (Statement only). Statement of Dirichlet's conditions of convergence. Half-range series, sine and cosine series. Double Integral: Concept of Upper sum, Lower sum, Upper Integral,				

			Lower Integral and Double Integral (no rigorous treatment is needed). Statement of Existence Theorem for continuous functions. Change of order of integration. Triple integral. Transformation of double and triple Integrals (Problems only). ii) Determination of volume and surface area by Multiple Integrals (Problems only).				
		Group-B Metric Space	Definition and examples of Metric Space. Neighbourhoods. Limit points. Interior points. Open and closed sets. Closure and Interior. Boundary points. Sub-space of a Metric Space. Cauchy Sequences. Completeness. Cantor Intersection Theorem. Construction of real number as the completion of the incomplete metric spaces of rationals. Real number as a complete ordered field (No proof of theorem).	Chalk and Duster, PDF	Assignment	10	Dr. Trisha Maitra
		Group-C Complex Analysis	Complex numbers as ordered pairs. Geometric representation of complex numbers. Stereographic projection.	Chalk and Duster, PDF	Assignment	10	Dr. Trisha Maitra

			Complex functions: Continuity and differentiability of complex functions. Analytic functions. Cauchy-Riemann Equations. Statement of Milne's Method, Harmonic functions.				
January-March	**Paper-VI**	**Group-A Probability and Statistics**	Mathematical Theory of Probability: Random experiments. Simple and compound events. Event space. Classical and frequency definitions of probability and their drawbacks. Axioms of Probability. Statistical regularity. Multiplication rule of probabilities. Bayes' theorem. Independent events. Independentrandom experiments. Independent trials. Bernouli trials and binomial law. Poisson trials. Random variables. Probability distribution. Distribution function. Discrete and continuous distributions. Binomial, Poisson, Gamma, Uniform and Normal distribution. Poisson Process (only definition). Transformation of random variables. Two dimensional probability distributions. Discrete and continuous	Chalk and Duster, PDF	Assignment	25	Mrs. Neha Ghorui Mundhra

			distributions in two dimensions. Uniform distribution and two dimensional normal distribution, conditional distributions.				
			Transformation of random variables in two dimensions. Mathematical expectation. Mean, variance, moments, central moments. Measures of location, dispersion, skewness and kurtosis. Median, mode, quartiles. Moment-generating function. Characteristic function. Two-dimensional expectation. Covariance, Correlation co-efficient, Joint characteristic function. Multiplication rule for expectations. Conditional expectation. Regression curves, least square regression lines and parabolas. Chi-square and t-distributions and their important properties (Statements only) Tchebycheff's inequality. Convergenece in probability. Statements of : Bernoulli's limit theorem, Law of large	Chalk and Duster, PDF	Assignment	30	Dr. Trisha Maitra

			numbers, Poisson's approximation to binomial distribution and normal approximation to binomial distribution. Concepts of asymptotically normal distribution. Statement of central limit theorem in the case of equal components and of limit theorem for characteristic functions.				
			Mathematical Statistics: Random sample. Concept of sampling and various types of sampling. Sample and population. Collection, tabulation and graphical representation. Grouping of data, Sample characteristic and their computation. Sampling distribution of a statistic. Estimates of a population characteristic or parameter. Unbiased and consistent estimates. Sample characteristics as estimates of the corresponding population characteristics. Sampling distributions of the sample mean and variance. Exact sampling distributions for the normal populations.	Chalk and Duster, PDF	Assignment	20	Ms. Piyali Saha

			Bivariate samples. Scatter diagram. Sample correlation co-efficient. Least square regression lines and parabolas. Estimation of parameters. Method of maximum likelihood. Applications to binomial, Poisson and normal population. Confidence intervals. Interval estimation for parameters of normal population. Statistical hypothesis. Simple and composite hypothesis. Best critical region of a test. Neyman-Pearson theorem (Statement only) and its application to normal population. Likelihood ratio testing and its application to normal population. Simple applications of hypothesis testing (for practical).				
	Group-B Paper VI	**Numerical Analysis and Computer Programming**	Errors in Numerical computation: Gross error, Round off error, Truncation error. Approximate numbers. Significant figures. Absolute, relative and percentage error. Operators:(Definitions and simple relations among them) Interpolation: Problems of interpolation, Weierstrass' approximation	Chalk and Duster, PDF	Assignment	13	Mrs. Neha Ghorui Mundhra

			theorem (only statement). Polynomial interpolation. Equispaced arguments. Difference table. Deduction of Newton's forward and backward interpolation formulae. Statements of Stirling's and Bessel's interpolation formulae. Error terms. General interpolation formulae: Deduction of Lagrange's interpolation formula. Divided difference. Newton's General Interpolation formula (only statement). Inverse interpolation. Interpolation formulae using the values of both f(x) and its derivative Idea of Hermite interpolation formula (only the basic concepts). Numerical Differentiation based on Newton's forward & backward and Lagrange's formulae.				
			Numerical Integration: Integration of Newton's interpolation formula Newton - Cote's formula. Basic Trapezoidal and Simpson's 1/3 rd. formulae. Their composite forms. Weddle's rule	Chalk and Duster, PDF	Assignment	20	Dr. Trisha Maitra

			(only statement). Statement of the error terms associated with these formulae. Degree of precision (only definition). Numerical solution of non-linear equations: Location of a real root by tabular method. Bisection method. Secant/Regula-Falsi and Newton-Raphson methods, their geometrical significance. Fixed point iteration method. Numerical solution of system of linear equations: Gauss elimination method.				
			Iterative method - Gauss-Seidel method. Matrix inversion by Gauss elimination method Eigenvalue Problems: Power method for numerically extreme eigenvalues. Numerical solution of Ordinary Differential Equation: Basic ideas, nature of the problem. Picard, Euler and Runge-Kutta (4th order) methods (emphasis on the problems only). Fundamentals of Computer Science and Computer Programming: Computer fundamentals:	Desktop, PDF	Assignment	15	Ms. Piyali Saha

			Historical evolution, computer generations, functional description, operating systems, hardware & software. Positional number systems: binary, octal', decimal, hexadecimal systems. Binary arithmetic. Storing of data in a computer: BIT, BYTE, Word. Coding of data - ASCIL, EBCDIC, etc. Algorithm and Flow Chart: Important features. Ideas about the complexities of algorithm. Application in simple problems. potential orientation. Friction : Laws of Friction, Centre of Gravity, Astatic Equilibrium, Virtual work, Stable and Unstable equilibrium, Momental ellipsoid. Equimomental system. Principal axis. D'Alembert's principle. D'Alembert's equations of motion. Principles of moments. Principles of conservations of linear and angular momentum. Independence of the motion of centre of inertia and the motion relative to the centre of inertia. Principle of energy. Principle of				

			conservation of energy.				
	Paper-VII Group-A	**Vector Analysis II**	Line integrals as integrals of vectors, circulation, irrotational vector, work done, conservative force, Green's theorem, Stokes' theorem and Divergence theorem	Desktop, PDF	Assignment	10	Ms. Piyali Saha
	Group-B	**Analytical Statics**	Definition of Fluid, Perfect Fluid, Pressure. To prove that the pressure at a point in a fluid in equilibrium is the same in every direction. Transmissibility of liquid pressure. Pressure of heavy fluids.			10	Mrs. Neha Ghorui Mundhra
	Group-C	**Rigid Dynamics**	Momental ellipsoid. Equi momental system. Principal axis. D'Alembert's principle. Equation of motion of a rigid body about a fixed axis. Equations of motion of a rigid body moving in two dimension. Equations of motion under impulsive forces.			15	Dr. Trisha Maitra
	Group-D	**Hydro-Statics**	Virtual work, Stable and Unstable equilibrium, Rotating fluids. The stability of the equilibrium of floating bodies. Pressure of gases.			10	Piyali Saha
			Definition of centre of pressure. Equilibrium of fluids in given			8	Mrs. Neha Ghorui Mundhra

			fields of force. Rotating fluids. The stability of the equilibrium of floating bodies. Pressure of gases.				
	Paper- VIII (A)	**Group- A (Algebra II)**	Linear Transformation (L.T.) on Vector Spaces .Linear Transformation and Matrices. Section-2 : Modern Algebra Normal sub-groups of a Group. Homomorphism and Isomorphism of Groups. Section - 3 : Boolean Algebra			14	Dr. Trisha Mailtra
		Group-B (Differential Equations III)	Laplace Transform and its application in ordinary differential equations: Laplace Transform and Inverse Laplace Transform. Statement of Existence theorem. Series solution at an ordinary point : Power Series solution of ordinary differential equations			8	Ms. Piyali Saha
		Group-C (Tensor Calculus)	A tensor as a generalized concept of a vector in an Euclidean space E3. Contravariant and covariant vectors. Invariants. Contravariant, covariant and mixed tensors. The Kronecker delta. Outer and Inner products of tensors. Quotient law. Reciprocal Tensor.			8	Mrs. Neha Ghorui Mundhra

			Riemannian space. Line element and metric tensor.				

Recommended Text books:

Hons:

- M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011.
- Joseph A. Gallian, Contemporary Abstract Algebra, 4th Ed., 1999.
- D.S. Malik, John M. Mordeson and M.K. Sen, Fundamentals of Abstract Algebra, 1997.
- B. W. Kernighan and D. M. Ritchi: The C-Programming Language, 2nd Edi. (ANSI Refresher), Prentice Hall, 1977.
- C. Xavier: C-Language and Numerical Methods, New Age International.
- Tensor Calculus - Barry Spain
- Vector Analysis and Tensor Calculus (Schaum Series) – Spiegel
- Advanced Calculus - David Widder (Prentice Hall)
- Elementary Treatise on Laplace Transform - B. Sen
- Vector Calculus - C. E. Weatherburn
- Analytical Statics - S. L. Loney
- Dynamics of a Particle and of Rigid bodies - S. L. Loney.
- Hydrostatics - A. S. Ramsay
- An Elementary Treatise on the Dynamics of a Particle & of Rigid bodies - S. L. Loney (Macmillan) The elements of probability theory and some of its applications: H. Cramer
- An introduction to probability theory and its applications (Vol 1) :
- W. Feller
- Mathematical methods of statistics: H. Cramer
- Theory of probability: B. V. Gnedenko
- Mathematical probability: J. V. Uspensky

Programme Course:

- T. M. Apostol, Calculus (Vol. I), John Wiley and Sons (Asia) P. Ltd., 2002.
- R.G. Bartle and D. R Sherbert, Introduction to Real Analysis, John Wiley and Sons (Asia) P.Ltd., 2000

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Lesson Plan- 2019-20

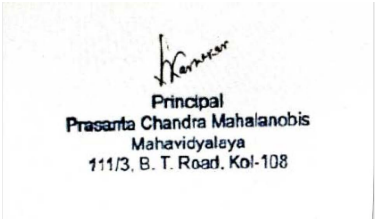
Semester III Programme Course(CBCS)

Name of the Department: CHEMISTRY

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
August-September	**Programme Course**	CEMGCOR03P	Determination of heat capacity of calorimeter for different volumes, Determination of enthalpy of ionization of acetic acid, . Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide	Experimental Instructions and Demonstrations	Laboratory Work	10 10	K N K M
		CEMGCOR03T	Chemical Energetics Aromatic Hydrocarbons, Organometallic Compounds, Chemical Equilibrium	Notes Prepared	Assignment	1 5 10	KM KN
November-January	**Programme Course**	CEMGCOR03T	Ionic Equilibria Aryl Halides, Alcohols, Phenols and Ethers, Carbonyl Compounds	Notes prepared and E-Resources ICT	Class Test, Assignment	8 8 15	KN KM KM
		CEMGCOR03P	Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps (use dilute solutions of soaps and shampoos to prevent damage to the glass electrode) using pH-meter and compare it with the indicator method	Experimental Instructions and Demonstrations	Laboratory Work	10	KM

Recommended Text books:

1. Palit, S. R., *Elementary Physical Chemistry* Book Syndicate Pvt. Ltd.
2. Mandal, A. K. *Degree Physical and General Chemistry* Sarat Book House
3. Pahari, S., *Physical Chemistry* New Central Book Agency
4. Pahari, S., Pahari, D., *Problems in Physical Chemistry* New Central Book Agency



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Lesson Plan- 2019-20

Part-3 Programme Course

Name of the Department: CHEMISTRY

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
September -November	**Programme Course**	CEMGT 34A	Chemical analysis, Volumetric Analysis, Polymers	Notesprepared and EResources ICT	ClassTest	15 8 10	KN KM KM
		CEMGP 34D	Quantitative Chemical Analysis	Experimental Instructions and Demonstratios	Laboratory Work	15 15	KN KM
December-January	**Programme Course**	CEMGT 34B	Industrial chemistry I, Paints, Varnishes and Synthetic Dyes, Drugs and pharmaceuticals	Notesprepared and EResources ICT	ClassTest	8 12 15	KM KM KN
February-March		CEMGT 34C	Environmental chemistry, Fats-Oils-Detergents, Pesticides, Food Additives	Experimental Instructions and Demonstrations	Assignment	15 15	KN KM

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Lesson Plan- 2019-20

Semester-2 Programme Course

Name of the Department: CHEMISTRY

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
March-April	**Programme Course**	CEMGCOR02T	Liquids Solids Comparative study of p-block elements:	Notesprepared and EResources ICT	ClassTest	15 8 10	KN KM KM
		CEMGCOR02P	Viscosity measurement Qualitative semimicro analysis of mixtures	Experimental Instructions and Demonstratios	Laboratory Work	15 15	KN KM
May-June	**Programme Course**	CEMGCOR02T	Chemical Kinetics Comparative study of p-block elements	Notesprepared and EResources ICT	ClassTest	8 12 15	KM KM KN
		CEMGT 34C	Study the kinetics Qualitative semimicro analysis of mixtures	Experimental Instructions and Demonstrations	Laboratory work	15 15	KN KM

Lesson Plan- 2019-20

Semester I Programme Course

Name of the Department: CHEMISTRY

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
September -November	**Programme Course**	CEMGCOR01T	Atomic Structure Chemical Periodicity Fundamentals of OrganicChemistry Stereochemistry	Notesprepared and EResources ICT	ClassTest	15 8 10	KN KM KM
		CEMGCOR01P	Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture, Estimation of oxalic acid by titrating it with KMnO4, Estimation of water of crystallization in Mohr's salt by titrating with KMnO4	Experimental Instructions and Demonstratios	Laboratory Work	15 15	KN KM
December-January	**Programme Course**	CEMGCOR01T	Nucleophilic Substitution and Elimination Reactions Aliphatic Hydrocarbons Acids and bases Redox reactions	Notesprepared and EResources ICT	ClassTest Assignment	8 12 15	KM KM KN
February-March		CEMGCOR01P	Estimation Qualitative Analysis of Single Solid Organic Compound, Estimation of Fe (II) ions by titrating it with K2Cr2O7 using internal indicator.	Experimental Instructions and Demonstrations	Laboratory Work	15 15	KN KM

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Lesson Plan- 2019-2020

Semester I Honours &Programme Course

Name of the Department: Food and Nutrition

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned

September - November	**Hons.**	**FNTACOR01T : HUMAN NUTRITION (THEORY)**	1**. Introduction to Food and Nutrition** Foods: Energy giving, body building and protective. Nutrients: macro and micro nutrients, Diet and balanced diet, Menu. Health and nutritional status. Malnutrition, functional food, prebiotics, probiotics, Phytochemicals, nutraceuticals. Fibre. Functions of foods: physiological, psychological, social. Food groups, food pyramid, Relation between food and nutrition, health and diseases. **2. Foods, Nutrients and cooking of food** Foods and their nutrient contents: Nutrients present in cereals and millets, pulses, nuts and oil seeds, fruits and vegetables, milk and milk products, flesh food, eggs, Condiment and spices, salt. Nonnutrient components of foods: phytate, tannins, oxalate, trypsin inhibitor,goitrogens and other toxic agents in food. Cooking: Beneficial and adverse effects of cooking. Different methods of cooking-dry, moist, frying, and micro wave cooking- advantage, disadvantage and the effect of various methods of cooking on foods, Solar cooking.	Audio recording Lecture method, Google meet virtual class, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh, e-book	Class Assignment	4 hrs 10 hrs	Juthi Saha

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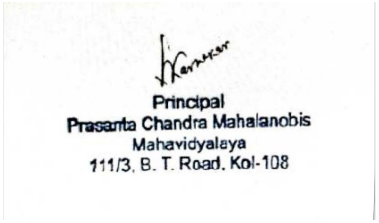
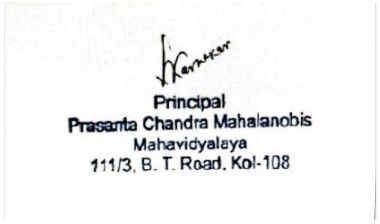
		FNTACOR01P: HUMAN NUTRITION (PRACTICAL)	1. Process involved in cooking, microwave, steaming, grilling, deep fat frying. 2. General concepts of weights and measures, Eye estimation of raw cooked foods 3. Preparation of food from different food groups and their significance in relation to health	Online demonstration of practical class	Assignments	10hrs 3hrs 12hrs	Dr. GuddiTiwary



		FNTACOR02T : PHYSIOLOGY IN NUTRITION (THEORY)	**1.Unit of Life: Cell and Tissue Structure** Difference between prokaryotic and eukaryotic cells & plant and animal cells, Structure and basic functions of animal cell organelles, Structure and functions of plasma membrane, Role of membrane in transport and communications, Importance of cell junction- tight, gap and desmosome, Types of human tissue- location, structure and functions. Structure of muscles, bones, teeth and joints. **2.Blood and body fluids** Blood and its composition, Morphology, formation and functions of formed elements, Blood groups and its importance in transfusion, hazards of mismatch blood transfusion. Mechanism of blood coagulation, Haemoglobin- structure and function. Extracellular fluid, lymph.	Audio recording Lecture method, Google meet virtual class, power point presentation and e-book PDF	Assignments	10hrs 10hrs	BikashMajumder

		FNTACOR02P: PHYSIOLOGY IN NUTRITION(PRACTICAL)	1. Determination of pulse rate in Resting condition and after exercise (30 beats/10 beats method) 2. Determination of blood pressure by Sphygmomanometer (Auscultatory method). 3. Interpretation of normal ECG curve with 6 chest leads.	Online demonstration of practical class	Assignments	5hrs 4hrs 10hrs	BikashMajumder



September - November	**Programme Course**	**FNTGCOR01T :FOOD AND NUTRITION (THEORY)**	**1. Introduction to Food and Nutrition** Definition of Food, Nutrition, Nutrient, Nutritional status, Dietetics, Balance diet, Malnutrition, Energy (Unit of energy – Joule, Kilocalorie). **2. Food and Nutrients** Carbohydrate, Protein, Fat, Vitamins and Minerals (calcium, phosphorus, sodium, potassium, iron, iodine, fluorine)- sources, classification, functions, deficiencies of these nutrients. Functions of water and dietary fibre. **3. Five food groups** Basic 5 food groups: Types, composition, nutritional significance, role of cookery of cereals, pulses, milk & milk products, meat, fish, egg, vegetables & fruits, nuts, oil & sugar. **4. Food Chemistry** Chemistry of carbohydrate, proteins and	Audio recording Lecture method, Google meet virtual class, power point presentation and e-resources.	Assignments	4 hrs 6 hrs	Dr.PriyadarshiniChakraborty

			fats. Vitamins and minerals			10 hrs	JuthiSaha
		FNTGCOR01P : FOOD AND NUTRITION (PRACTICAL)	1. Elementary idea of weights & measures. 2. Preparation of cereals, pulses, vegetable, egg, milk, fish, nuts dishes.	Online demonstration ofpracticals	Assignments	4hrs 6hrs	JuthiSaha

			3. Planning and preparation of diet of an adult male/female.			6hrs	JuthiSaha

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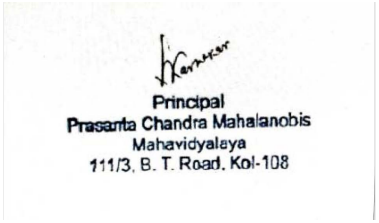
November - January	**Hons.**	**FNTACOR01T : HUMAN NUTRITION (THEORY)**	**3.Food energy and energy requirements** The energy value of foods: Physical and physiological calories. Bomb calorimeter Energy requirement of an individual: Basal metabolic rate (BMR) and physical activity. . BMR: Measurement (direct and indirect), factors affecting BMR, SDA of foods. physical activity ratio (PAR). Classification of activities based on occupations. Nutritional requirements and Recommended dietary allowances (RDA): factors affecting RDA, Application of RDA, Reference man and woman.. **4. Digestion of Foods** Components of gastrointestinal tract. Structure of different segments of GI tract. Digestive glands: structure of salivary glands, gastric glands and intestinal glands. Structure of pancreas and liver., Digestive secretions: salivary juice, gastric juice, pancreatic juices and intestinal juices. Bile and bile secretion. Digestion and absorptions of carbohydrate, protein, lipid, fat soluble vitamins, water soluble vitamins(thiamine, riboflavin, niacin, pyridoxine, folate, vit B12, vit C), minerals	Audio recording Lecture method, Google meet virtual class, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh, e-book, e-books , text books, reference books, journals and notes	Class Assignment	15 hrs	Dr. Priyadarshini Chakraborty

			(Ca, Fe, I, F, Cu, Zn)	Lecture in virtual mode, power point presentation and e-resources , e-books , text books, reference books, journals and notes	Class Assignment	20 hrs	

		FNTACOR01P: HUMAN NUTRITION (PRACTICAL)	4. Preparation of supplementary food from different age group and their nutritional significance 5. Planning and preparation of low cost diet	Online demonstration of practical class	Assignments	12hrs	**JuthiSaha**



			for Grade I and Grade II malnourished child .			4hrs	
		FNTACOR02T : PHYSIOLOGY IN NUTRITION (THEORY)	**3. Cardiovascular system** Structure of heart, artery, vein and capillary, Properties of cardiac muscle, Cardiac cycle, cardiac output, heart rate, heart sounds, ECG- normal and abnormal. Systemic and pulmonary circulation. Blood pressure, pulse pressure Radial pulse, coronary circulation **4. Respiratory system** Structure of lungs: alveoli and airways. Respiratory volumes and capacities,Mechanics of breathing. Oxygen and carbon dioxide transport, Neural and chemical control of breathing. **5. Renal Physiology, skin and body temperature** Anatomy of renal system: kidney, ureter, urethra and urinary bladder, Nephron: structure, Juxtaglomeralarapparatus	Audio recording Lecture method, Google meet virtual class	Assignments	10hrs 10hrs	BikashMajumder

			GFRand GFI, Tubular functions, Urine formation: Counter current exchanger andmultiplier. Role of kidney in water and electrolyte balance. pHregulation by kidney. Structure of skin. Sweat and sweat glands. Sebum. Core body temperature, heat loss and heat gain, Regulation of body temperature.			10hrs	

		FNTACOR02P: PHYSIOLOGY IN NUTRITION(PRACTICAL)	4. Measurement of Peak Expiratory flow rate.(By spirometer) 5. Determination of Bleeding Time (BT) and Clotting Time (CT). 6. Detection of Blood group (Slide method).	Online demonstration of practical class	Assignments	6hrs 6hrs 6hrs	BikashMajumder
	Programme Course	**FNTGCOR01T :FOOD AND NUTRITION (THEORY)**	**5. Nutrients Metabolism** Elementary idea of metabolism, enzymes and hormones- name and their important functions. Metabolism in brief (Glycolysis, Glycogenesis, Gluconeogenesis, Cori's cycle, Kreb's cycle, Deamination, Transamination. Role of hormones in carbohydrate metabolism. **6. Basic Metabolism Rate (B.M.R)** B.M.R: Definition, factors affecting B.M.R. and Total Energy Requirement (Calculation of energy of individuals).	Audio recording Lecture method, Google meet virtual class, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh, e-book	Assignments	12 hrs	**JuthiSaha**

			7. Deficiency diseases Deficiency diseases (Nutritional anaemia, PEM, IDD, VAD)-Aetiology, Prevalence, Clinical findings, Prevention & Treatment.			6hrs 7hrs	

		FNTGCOR01P : FOOD AND NUTRITION (PRACTICAL)	4. Planning of a day's diet for pregnant & lactating mother. 5. Preparations of supplementary foods for infants.	Online demonstration of practical class	Assignments	6hrs 6hrs	**JuthiSaha**

Recommended Text books:

For FNTACOR01T:

1. B.Srilakshmi : Nutrition Science, New Age International Publishers

2. Guthrie, A.H.: Introductory Nutrition, 6th Ed. The C.V. Mosby Company

3. Robinson, C.H.Lawer, M.R.; CheiToweth, W.L. and Garwick, A.E.: Normal and Therapeutic Nutrition.17th Ed. Mac Milan Publishing Co.

4. Swaminathan, M : Essentials of Foods and Nutrition, Vols-1and II. Ganesh and Co. Madras.

For FNTGCOR01T:

1. B.Srilakshmi : Nutrition Science, New Age International Publishers

2. Guthrie, A.H.: Introductory Nutrition, 6th Ed. The C.V. Mosby Company

3. Robinson, C.H.Lawer, M.R.; CheiToweth, W.L. and Garwick, A.E.: Normal and Therapeutic Nutrition.17th Ed. Mac Milan Publishing Co.

4. Swaminathan, M : Essentials of Foods and Nutrition, Vols-1and II. Ganesh and Co. Madras.

5. Chatterjee CC (1988). Text Book of Physiology – Vol I & II.

6.Murray, R. K. Grannen, D. K.; Mayes, P. A. and Rodwell. V. W: Harper's Biochemistry. Lange Medical Book

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Lesson Plan- 2019-2020

Semester III Honors. &Programme Course

Name of the Department: ___Food and Nutrition_____

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
August-September	**Hons**	**FNTACOR05T: NUTRIENTS METABOLISM(THEORY**	**1.Carbohydrate Metabolism** Glycolysis & its regulation. Glycogen metabolism. Metabolism of pyruvate. Outline of pentose phosphate	Audio recording Lecture method;power point presentation and e-	Class Assignment/ class tests	12hrs	**JuthiSaha**

			pathway. Anaplerotic reactions. Importance of gluconeogenesis. **2. Lipid Metabolism** Fatty acid synthase and de novo biosynthesis of fatty acid; regulation and mechanism of chain elongation. Metabolism of cholesterol, its control and pathophysiological importance. β-oxidation of fatty acids. **3.Amino acid Metabolism** Essential amino acids.Transamination. Deamination. Transmethylation. Decarboxylation. glucogenic and ketogenic amino acids. Outline of urea cycle. Inborn errors of Metabolism.	resources , e-books , text books, reference books, journals and notes		10hrs 6hrs	**Dr.Priyadarshini Chakraborty**

		FNTACOR05P: NUTRIENTS METABOLISM(PRACTICAL)	1. Estimation of Vitamin C in citrus fruits. 2. Estimation of calcium in blood (using kit) and drinking water (Complexometry). 3. Estimation of sodium and potassium in blood (using kit).	Online demonstration of practical class	Class assignment/class test/ submission of notebooks	10hrs 10hrs 6hrs	Dr. PriyadarshiniChakraborty
		FNTACOR06T: NUTRITION THROUGH LIFE SPAN(THEORY)	**1.Basics of Meal Planning** Principles of meal planning, Food groups and Food exchange list, Factors affecting meal planning and food related behavior **2.Nutrition in Adults and Elderly** Physiological changes in elderly. .RDA and nutritional guidelines, nutritional concerns and healthy food choices for: Adult man and	Audio Lecture method; Chalkboard, pdf, ppt, ict class	Assignments	3hrs 6hrs	Dr. Guddi Tiwary Dr. Guddi Tiwary Dr. Guddi Tiwary

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			woman, Elderly. **3.Nutrition during Pregnancy** Nutrition During Pregnancy: Factors (non-nutritional) affecting pregnancy outcome, importance of adequate weight gain during pregnancy, antenatal care and its schedule, Nutritional requirements during pregnancy and modification of existing diet and supplementation, Deficiency of nutrients, specially energy, iron folic acid, protein, calcium, iodine. Common problems of pregnancy and their managements, specially - nausea, vomiting, pica, food aversions, pregnancy induced hypertension, obesity, diabetes. Adolescent pregnancy.			10hrs	

		FNTACOR06P: NUTRITION THROUGH LIFE SPAN(PRACTICAL)	Meal planning and preparation of adequate meal for different age groups with special reference to different physiological conditions: infants, pre-schooler, school children, adolescents	Online demonstration of practical	Assignment	20hrs	Dr. Guddi Tiwary
		FNTACOR07T: ELEMENTARY DIETETICS AND MENU PLANNING (THEORY)	**1.Dietetics and Dietician** Definition and objective of dietetics, Dieticians-Definition, Classification and Responsibility **2.Food groups** Four food groups (Caribbean Food Guide; Canadian Food Guide; USA Food Pyramid; British Food Guide; Recommended Nutrient Intake (RNI); Dietary Value Intake; Dietary Reference Value, Five food group system of ICMR. Structure and composition of cereals. Wheat- structure and composition, types (hard,	Audio recording Lecture method, Google meet virtual class, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh, e-book journals and texts.	Assignment	4hrs 12hrs	Dr. Priyadarshini Chakraborty Dr. Priyadarshini Chakraborty

			soft/ strong, weak) ,Diagrammatic representation of longitudinal structure of wheat grain. Malting, gelatinization of starch, types of browning- Maillard & caramelization. Rice- structure and composition, parboiling of rice- advantages and disadvantages. Structure and composition of pulses, toxic constituents in pulses, Milk and Milk Products- composition, classification and processing, Eggs- com[position, Meat, fish & poultry- Types, composition, Sugar & Sugar products- Types and composition, Fats & Oils-Types & sources, Food adjuncts- spices, condiments, herbs, extracts;concentrates essences, food colours, origin, classification, convenience foods, Bevarages-Tea, Coffee, Chocolate , cocoa poeder- composition				Dr. Priyadarshini Chakraborty

			3.Dietary guidelines Nutritive values as a basis for classification of food, Recommended Daily Allowances (RDA), Dietary guidelines for Indians and food pyramids.	Lecture method; Text books and e-book		4hrs	
		FNTACOR07P: ELEMENTARY DIETETICS AND MENU PLANNING (PRACTICAL)	1. Planning and preparation of normal diets. 2. Planning and preparation of different fluid diets.	Online demonstartion of practical class	Assignment	10hrs 10hrs	JuthiSaha
	Hons and Programme course	**FNTSSEC01M: INSTRUMENTATION**	**1.Microscopy** Brightfield and darkfield microscopy, Optical Microscopy, Phase contrast Microscopy, Inverted Microscopy **2.Chromatography**	Powerpoint presentation, audio lecture method, e-book referred Powerpointpr	Assignment	4hrs 6hrs	JuthiSaha Dr.PriyadarshiniChakraborty

			Principles and applications of paper chromatography (including Descending and 2-D), Thin layer chromatography, HPLC. Separation of mixtures by paper / thin layer chromatography **3.Spectrophotometry** Principle and use of study of absorption spectra of biomolecules, Analysis of biomolecules using UV and visible range, Colorimetry. Protein concentration of spectrophotometer/ colorimeter ,	esentation, audio lecture method, Demonstratio n of models and videos		6hrs	JuthiSaha
	Programme Course	**FNTGCOR03T: COMMUNITY, NUTRITION AND HEALTH ASSESSMENT (THEORY)**	**1.Concept on Community** Concept and types of Community. Concept of community nutrition, Community health, Factors affecting community health.	Audio recording Lecture method; power point presentation and e-resources , e-book,	Assignment	4hrs	JuthiSaha

			2.Nutritional Assessment Nutritional Assessment: Meaning, need, objectives and importance. Method of assessment of nutritional status – Anthropometry, Clinical, Biochemical, Dietary surveys, Vital health statistics	journals and texts. Demonstration of models and videos		15hrs	
		FNTGCOR03P: COMMUNITY, NUTRITION AND HEALTH ASSESSMENT(PRACTICAL)	1. Anthropometric Measurement of infant - Height, weight, circumference of chest, mid - upper arm circumference. Calculation of BMI. 2. Clinical assessment and signs of nutrient deficiencies.	Online demonstration of practical class	Assignment/ Projects/field visits	10hrs 10hrs	JuthiSaha
November-January	**Hons**	**FNTACOR05T: NUTRIENTS METABOLISM(THEORY)**	**4.Biological oxidation** Mitochondrial electron transport chain. High energy phosphate bond. Formation of ATP. **5.Nucleic acid metabolism** Chemical structure of purine	Audio record lecture; power point presentation and e-resources , e-book, journals and texts. Demonstratio	Assignment/ class test	2hrs 5hrs	JuthiSaha

			and pyrimidine, Catabolism and anabolism of pyrimidines. Gout - occurrence, prognosis, progression and therapy. **6. Vitamins** Classification, charcateristics and chemical properties of fat and water soluble vitamins. Functions of fat and water soluble vitamins.Hypervitaminosis. Role of vitamins A, D, C,B1,B2B6, B12 and folic acid in metabolism. **7.Mineral Metabolism** Role of minerals in physiology. Trace elements. Sodium potassium balance. Role of calcium, iron and zinc in human body - metabolism, functions, deficiency and toxicity.	n of models and videos Powerpoint presentation, Lecture method, e-book referred, study material Powerpoint presentation, Lecture method, e-book referred, study material		8hrs 8hrs	**Dr.Priyadarshini Chakraborty** **Dr. PriyadarshiniChakraborty**

		FNTACOR06T: NUTRITION THROUGH LIFE SPAN(THEORY)	**4.Nutrition during Lactation** Nutrition during Lactation: Nutritional requirements during lactation, dietary management, food supplements, galactogogues, preparation for lactation. Care and preparation of nipples during breast feeding. **5.Nutrition during Infancy** Nutrition during Infancy: Infant physiology relevant to feeding and care, Breast feeding, colostrum, its composition and importance in feeding, Initiations of breast feeding. Advantages of exclusive breast feeding. Basic principles of breast feeding. Introduction of supplementary foods, initiation and management of weaning, Baby-led weaning. Bottle feeding-circumstances under which bottle feeding is	Audio recorded Lecture method; PPt presentation	Assignment	8hrs 12hrs	**Dr. Guddi Tiwary** **Dr. PriyadarshiniChakraborty**

			to be given. Care & sterilization of bottles. Preparation of formula. Mixed feeding, breast feeding and artificial feeding, Management of preterm and low birth weight babies. **6. Nutrition for Children and Adolescents** Growth and development in children, RDA, nutritional guidelines, nutritional concerns and healthy food choices for: Preschool children, School children, Adolescents			8hrs	**Dr. GuddiTiwary**
		FNTACOR06P: NUTRITION THROUGH LIFE SPAN(PRACTICAL)	Meal planning and preparation of adequate meal for different age groups with special reference to different physiological conditions: adults, pregnancy, lactation and elderly.			20hrs	**Dr. Guddi Tiwary**
		FNTACOR07T: ELEMENTARY	**4.Menu Planning**	Audio recorded	Assignment	8hrs	**JuthiSaha**

		DIETETICS AND MENU PLANNING (THEORY)	Menu Planning: Rationale for menu planning, Factors affecting food choice, Nutritional factors, other factors; Exchange list and food composition tables for menu planning, Steps in the development of exchange list, Factors to be considered when planning the regular balanced diet: adequacy, balance caloric control, moderation, variety and aesthetics. **5.Basics of diet therapy** Basic concepts of diet therapy: Therapeutic adaptations of normal diet, principles and classification of the therapeutic diets, Nutrient modifications**.** **6. Diet for health care** Team approach to health care. Assessment of Patient's	Lecture method; power point presentation and e-resources , e-book, journals and text books.		10hrs 4hrs	

			needs. **7. Routine Hospital Diet** Routine Hospital Diets: Regular, light, soft, fluid, parenteral and enteral feeding.			5hrs	
		FNTACOR07P: ELEMENTARY DIETETICS AND MENU PLANNING (PRACTICAL)	3. Planning and preparation of different soft/semi solid diets. 4. Planning and preparation of different nutrient modified diet	Online demonstration of practical class	Assignment	15hrs 15hrs	**Dr. Priyadarshini Chakraborty**
	Hons and Programme course	**FNTSSEC01M: INSTRUMENTATION**	**4.Electrophoresis** Principle and applications of native polyacrylamide gel electrophoresis **5.Centrifugation** Preparative and analytical centrifugation, density gradient centrifugation and	Audio recorded Lecture power point presentation and e-resources , e-book, journals and text books	Project work	3hrs 6hrs	**JuthiSaha**

			ultracentrifugation Separation of components of a given mixture using a laboratory scale centrifuge **6. ECG and EEG** Principles of ECG and EEG, application of ECG and EEG			1hr 1hr	**Dr. GuddiTiwary**
	Programme Course	**FNTGCOR03T: COMMUNITY, NUTRITION AND HEALTH ASSESSMENT (THEORY)**	**3.Concept of surveillance system** Elementary idea of health agencies - FAO, WHO, ICMR, ICDS, ICAR, CSIR, ANP, VHAI, NIN and CFTRI. Role of voluntary health organisation in the improvement of Community health. **4.Nutrition Intervention Programmes** Current National Nutrition Intervention Programmes in	Audio recorded Lecture;power point presentation and e-resources , e-book, journals and text books	Assignment/ class tests	12hrs 12hrs	**Dr. Guddi Tiwary**

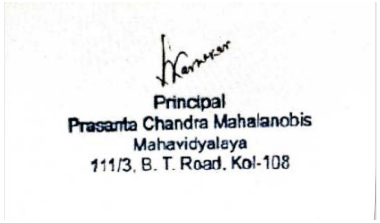
			India- SNP, ANP, ICDS, Midday meal, NIDDCP, NPPNB, NNAPP. **5.Nutrition Education** Nutrition Education: Definition, objectives of nutrition education. Methods of imparting nutrition education.			8hrs	
		FNTGCOR03P: COMMUNITY, NUTRITION AND HEALTH ASSESSMENT(PRACTICAL)	3. Diet survey by 24 hours recall method. 4. Preparation of homemade ORS. 5. Preparation of low cost and medium cost school tiffin.	Online demonstration of practical Class	Assignment	10hrs 2hrs 10hrs	**Dr. Guddi Tiwary**

Recommended Text books:

Recommended Text books:

For FNTACOR05T:

1. Lehninger, A.L.; Nelson, D. L. and Cox, M. M. Principles of Biochemistry. CBS Publishers and Distributors.
2. A.C Deb, (2001) Fundamental of Biochemistry, New Central Book Agency (p) Ltd; 9th edition.
3. Debajyoti Das, Biochemistry, 14th Ed, Academic publishers.



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Lesson Plan- 2019-2020

PART –III Honors. &Programme Course

Name of the Department: _Food and Nutrition _____

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
August-January	**Hons**	**Paper V: Unit I NUTRITIONAL BIOCHEMISTRY**	**1. Enzymes & Coenzymes** Enzymes: Definition & Classification, Kinetics (Gibs free energy change, Reaction initiation energy), michalies-Menten equation,	Audio recorded Lecture,power point presentation and e-resources available on SWAYAM	Assignment/ class tests	4hrs	**Dr. PriyadarshiniChakraborty**

			Reciprocal plot & its significance, Vmax& Km, substrate specificity, enzyme inhibition (irreversible-Penicillin inhibition**,** reversible explained from Reciprocal plot, allotter-ribonucleotidereductase inhibition by nucleotides), isozymes-ex, LDH. COENZYMES-Definition, Biochemical functions of NAD, NADP, FAD, CoA, Tetrahydrofoltate, TPP, Names of vitamins present in those coenzymes. **3.LIPIDS** Beta Oxidation, (alpha and omega oxidation-definition only), Synthesis & utilization of ketone bodies, Ketosis,	(Inflibnet Centre); E-PG Pathshala, Egyankosh;		4hrs 12hrs	

			Causes of Fatty liver. **5.NUCLEIC ACID; Structure of purines &Pyrimidines, Nucleosides &Nucleotides, Formation of Nucleic acid chain from Nucleotides, Importance of Thymine in D & their functions (in brief), Structure of t-RNA, Codons, Definitionof Central Dogma (Replication, Transcription, Translation- elementary idea only0, & Machineries needed in each step (only names of the enzymes and coenzymes)**			4hrs	JuthiSaha

		Paper V **Unit II:** **Microbiology**	**1. Microscope:** Different parts of Microscope and its functions. **2.Cultication of Bacteria:** Nutritional requirements of mcroorganisms, typesof growth media (selecstive, differential, enriched media-definition with example). Pure culture methods (streak plate, sprrad plate, pour plate, slant culture), Anaerobic cultivation of bacteria. **3.Growth of Bacteria-** Definition , Growth phase, direct and indirect measurement of growth, Factors affecting growth (pH, temp and oxygen) **4.Stains and staining techniques** – dye (Chromophore, auochrome- definition	ICT,Lecture method; power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh; video demonstrations	Assignment/ class tests	16 hrs	Dr. Priyadarshini Chakraborty

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			with example). Clasification of stains, principles, simple staining, negative staining, differential staining (Gram staining and acid fast staining).				
		Paper VI (Unit I: DIET THERAPY	1. Basic concept of diet therapy- different definitions related to diet therapy 2. Routine Hospital Diet- Modification of normal diet into therapeutic diet. Purpose of diet therapy. Different modifications. 3. Diet with Energy Modification- Energy modification & nutritional care for weight management , identifying the overweight obese, aetiological factors contributing obesity, prevention & treatment	Audio recording Lecture method, Google meet virtual class, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh, e-book	Assignment/ class tests/practical demonstration/notebooks	10hrs 8hrs 8hrs	JuthiSaha

			of obesity. Low energy diet & balanced energy reduction. Underweight- aetiology, an assessment , high energy diets for weight gain. 4. DIET FOR FIBRILE CONDITION- different causes of fever. Metabolic changes during fever (elementary idea), General dietary consideration. Causes , clinical features, treatments & dietary management of Short time fever (influenza, Chronic fever (tuberculosis), Intermittent fever (Malaria). 5.Diet during Surgery- General introduction, Pre- &Post operative diet (brief idea), Dietary management.				
		Paper VI Unit – II: DIET THERAPY	1.CARDIOVASCULAR DISEASES; General information & brief idea.	Audio recording Lecture	Assignment	15hrs	Dr.Priyadarshini Chakraborty

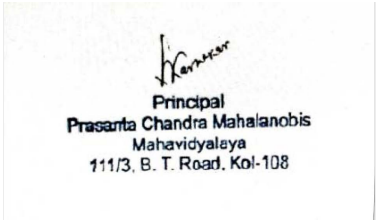
			Causes or factors of CHD in brief. Dietary management. Causes , symptoms in brief & dietary management of the following: Atherosclerosis, hypertension, hypercholesterolemia, IHD, Congestive cardiac failure. 2. RENAL DISEASES- General introduction. Causes , symptoms in brief & dietary management of the following; Type I or Glomerulonephritis, Type II or Nephrotic Syndrome, Acute & Chronic renal failure ,Renal calculi.	method, Google meet virtual class, power point presentation and e-resources			
		PAPER VII UNIT I: BIOCHEMISTRY PRACTICAL	GROUP A- QUALITATIVE ESTIMATION- 1. Qualitative estimation	Audio recorded Lecture, power point		10 hrs	JuthiSaha

			of carbohydrate (Mono, di and poly saccharides), Glucose, Fructose, Sucrose, Lactose, Starch, Dextrin. 2.Colour reactions of protein. GROUP B-QUANTITATIVE ESTIMATION: 1.Satandard curve of protein by Biuret method using BSA. 2.Standard curve of Protein by Folin Phenol method using BSA. 3.Estimation of unknown protein from egg or serum protein 4. Standard curve of PNP 5. Preparation of Buffer.	presentation and Video demonstrations of practical.		10 hrs	Dr. Priyadarshini Chakraborty

		PAPER VII- UNIT II- (FOOD PRESERVATION AND PREPARATION) PRACTICAL	**1**. Introduction to food preservation and different methods of food preservation. Purpose of food preservation. 2. Use of natural and chemical preservatives in prepararion of different preserved products- jam, jelly, squash, pickles, murabbaetc	Audio recorded Lecture, power point presentation and Video demonstrations of practical. Virtual Lab visit conducted	Class assignments	12hrs 2hrs	Dr. Priyadarshini Chakraborty

		PAPER VIII, UNIT-I: DIET THERAPY PRACTICAL	1. Introduction to therapeutic nutrition, its objectives. Different modification techniques (demonstration). 2. Planning and preparation of normal diet 3. Planning and preparation of clear fluid and full fluid diet 4. Planning and preparation of soft diet.	Online demonstration of practical	Assignment/ project report/ Notebooks	15hrs	JuthiSaha
		PAPER VIII- UNIT II- MICROBIOLOGY	1.Basic idea of process of sterilization 2.Preparationof Nutrient Agar media	Online demonstration of practical	Assignment	12 hrs	Dr.PriyadarshiniChakraborty

		PAPER VIII-UNIT III-(PROJECT AND SEMINAR)	1. Review and Project work 2.Seminar presentation models related to health and nutrition education.	Preparation of chart/ poster preparation, and dissertation	Assignment	8 hrs 15hrs	Dr. Priyadarshini Chakraborty Dr.GuddiTiwary



	Programme course	**PAPER IV-UNIT-I (GROUP-A; COMMUNITY NUTRITION)** **PAPER IV-UNIT-I (GROUP**	1.Concept of community 2. Methods of assessment of nutritional status-Anthropometry, Clinical, Biochemical , Dietary surveys, Vital health statistics. 4. Nutrition education in community- Definitions, methods Uses. 1. Elementary structure and characteristics of	Audio recorded Lecture, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh;	Assignment	15 hrs	JuthiSaha

		B- FOOD MICROBIOLOGY &SANITATION)	microbes. Bacteria , Virus, Fungi including mould, yeast and protozoa. 2. Food spoilage: Cereal, Pulses, Vegetables & Fruits, Milk & milk products, Feshy foods, Fats & oils. 4. Food preservation- Definition, objectives, Methods- main principle. Procedure, common examples.				Dr. Priyadarshini Chakraborty

		PAPER IV-UNIT-II (PRACTICAL)	1. Diet survey in household of slums/rural area	Online demonstration of practical	Assignment	5hrs	Dr. GuddiTiwary

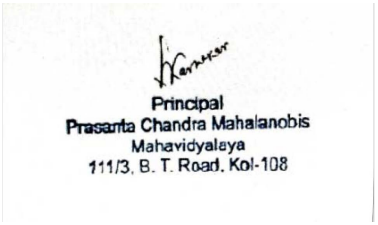
Recommended Text books:

For PAPER V & VII:

1. Lehninger, A.L.; Nelson, D. L. and Cox, M. M. Principles of Biochemistry. CBS Publishers and Distributors.
2. A.C Deb, (2001) Fundamental of Biochemistry, New Central Book Agency (p) Ltd; 9th edition.
3. Debajyoti Das, Biochemistry, 14th Ed, Academic publishers.
4. Frazier, W. C. and Westhoff, D. C. (1988): 4th edition, Food Microbiology, MaGraw Hill Inc.
5. Jay James. N. (1986) : 3rd edition, modern Food Microbiology, Van Nestrand Reinhold Company Inc.
6. Pelczar, M.I. and Reid, K. D. (1978): Microbiology, McGraw Hill Company, New York.
7. Benson Harold, J. (1990) : Microbiological Application, Publishers, U.S.A.
8. Colling, C.E. and Lyne, P.M. (1976) : Microbiological Methods Butterworth. London
9. Jay JM, Modern Food Microbiology, CBS Publication New Delhi 3rd Ed. 1987

For PAPER VI :

1. Anderson, L., Dibble, M.V., tukki, P.R., Mitchall, H.S., and Rynbergin H.J.: Nutrition in Health and Disease, 17th edition, J. B. Lipincott& Co. Philadelphia.
2. Antia F. P.: Clinical Dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.
3. Mahan, L. K., Arlin, M. T.: Krause's Food, Nutrition and Diet Therapy. 8th edition, W. B. Saunders Company, London.
4. Robinson. C.H. Lawler, M.R. Chenoweth, W. L., and Garwick, A. E. (1986): Normal and Therapeutic Nutrition. 17th edition, MacMilian Publishing Co.
5. Williams. S. R.: Nutrition & Diet Therapy, 6th edition, Times Mirror/Mosby College Publishings, St. Louis.



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Lesson Plan- 2019-2020

Semester II Honours &Programme Course

Name of the Department: Food and Nutrition

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
March-April	**Hons.**	**FNTACORO03T -FOOD CHEMISTRY, BIOPHYSICS AND BIOCHEMICAL PRINCIPLES(THEORY)**	**1.Proteins and Amino acids-** • Classification of proteins. • Protein structure and organization: primary, secondary, tertiary and quaternary structure. • Amino acid classification. • Physical and chemical properties of amino acid and protein. • Biological value of proteins (BV), Net protein utilization (NPU) and Protein efficiency ratio (PER).	Online class. Powerpoint Presentation. Lecture. Board work. E-books, Study materials	Class Assignment	10hrs	Dr.PriyadarshiniChakraborty
			2.Carbohydrate Chemistry • Carbohydrates: classification- mono-, di- & polysaccharide • Stereoisomerism in carbohydrates. • Physical and chemical properties of mono-, di- and polysaccharides; • Dietary fibre - definition; Fibre components -	Online class. Powerpoint Presentation. Lecture. Board work, Study materials as pdf	Class Assignment	20hrs	JuthiSaha

			cellulose, hemicellulose, pectin substances, lignin.				
		FNTACOR03P: FOOD CHEMISTRY, BIOPHYSICS AND BIOCHEMICAL PRINCIPLES (PRACTICAL)	1. Qualitative tests for the identification of: Glucose, Galactose, Fructose, Sucrose, Lactose, Starch, Dextrin. 2. Glucose estimation in blood 3. Qualitative tests for the identification of - Albumin, Gelatin, Peptone, urea, uric acid.	Online practical class demonstration	Continuous assessment Continuous assessment Continuous assessment	10hrs 6hrs 15hrs	JuthiSaha
		FNTACOR04T: HUMAN PHYSIOLOGY (THEORY)	**1. Physiology of excitable cells:** • Different types of muscles and their structures • Mechanism of skeletal muscle contraction and relaxation, • Muscle energetic, • Isometric and isotonic muscle contraction. • Structure of nerves. • Nerve impulse and its conduction. • Synapse and Neuromuscular junctions. • Synaptic transmission. • Neutrotrophins	Online Lecture method; PDF	Assignments	25hrs	BikashMajumder
		FNTACOR04P: HUMAN PHYSIOLOGY (PRACTICAL)	1. Test for Visual acuity, Colour vision. 2. Identification with reasons of histological slides (Lung, Liver, Kidney,	Offline hands-on practical class	Assignments	10hrs 25hrs	BikashMajumder

			Smallintestine, Stomach, Thyroid, Adrenal, Pancreas, Testis, Ovary and Muscle of mammals).				
	Programme Course	**FNTGCOR02T: HUMAN BODY AND NUTRITION (THEORY)**	**1. Animal cell** • Animal cell: definition, structure and functions of different parts. Organelle **2. Blood and body Fluids:** • Blood, composition, blood corpuscles, functions, blood groups and its importance in transfusion, hazards of mismatch blood transfusion. Rh factor, blood coagulation. • Lymph: Compositionand function. **3. Cardiovascular and Respiratory system** • Heart: Junctionl tissues and functions. Cardiac cycle, cardiac output, blood pressure and its regulation. Mechanism of respiration, Respiratory centre. Respiratory regulation.	Lecture method; Chalkboard, PDF	Assignments	5hrs 10hrs 10 hrs	Dr.PriyadarshiniChakraborty BikashMajumder

		FNTGCOR02P: HUMAN BODY AND NUTRITION (PRACTICAL)	1. Determination of pulse rate in Resting condition and after exercise (30 beats/10 beats method) 2. Determination of blood pressure by Sphygmomanometer (Auscultatory method). 3. Identification of	Omline hands onpracticals	Assignments	6hrs 6hrs	BikashMajumder

			permanent sections (Blood cells, Stomach, Small intestine, large intestine, Liver, pancrea**s).**			6hrs	
May-June	**Hons.**	**FNTACORO03T -FOOD CHEMISTRY, BIOPHYSICS AND BIOCHEMICAL PRINCIPLES(THEORY)**	**1.Lipid Chemistry** • Lipids: Classification- Fatty acids, triglycerides, phospholipids, Glycolipids, sterols and steroids. Eiconoids. • Edible fats and oils - physical and chemical properties, Hydrogenation and importance of fats in the diet. • Physical and chemical properties of saturated, monounsaturated, polyunsaturated fatly acids, Trans fatty acids, phospholipids, cholesterols and liposomes. • Essential fatty acids. **2. Enzymes** • Enzmes: Definition and structure. • Enzyme substrate interaction. • Enzyme kinetics, • MichaelisMentenconstant(Km). • Enzyme inhibition • .Factors regulating enzyme activities, • Isoenzymes, Pro-enzymes, Ribozymes, Abzymes, • Concept of Rate limiting enzymes.	Online class. Powerpoint Presentation and Lecture. E-books, Study materials	Class assignment	15 hrs 10hrs	Dr. Priyadarshini Chakraborty
		FNTACOR03P: FOOD CHEMISTRY, BIOPHYSICS AND	1. Protein estimation by Biuret and Lowry methods. 2. Estimation of urea	Online Hands-on Practical Class	Class assignments	6hrs 6hrs	Dr. Priyadarshini Chakraborty

		BIOCHEMICAL PRINCIPLES(PRACTICAL)	and uric acid in blood. 3. Determination of acid value of oils by titrimetric method. 5. Determination of specific gravity of liquid (fruit juice, blood).			6hrs 6hrs	
		FNTACOR04T: HUMAN PHYSIOLOGY (THEORY)	**1.Endocrine system** • Structure, hormones and functions of pituitary, thyroid, parathyroid, adrenal gland and pancreas. • Hypothalamus as an endocrine gland. • Gastrointestinal hormones. Growth factors.	Lecture method; Chalkboard, PDF	Assignments	20hrs	BikashMajumder
		FNTACOR04P: HUMAN PHYSIOLOGY (PRACTICAL)	1. Qualitative determination of glucose in blood or urine. 2. Total count (TC) and Differential count (DC)	Online demonstration of practical	Assignments	10hrs	BikashMajumder
	Programme Course	**FNTGCOR02T: HUMAN BODY AND NUTRITION (THEORY)**	**1. Digestive system and Digestion** • Digestive system: Structures involved in digestive system (mouth, oesophagus, stomach, small intestine, large intestine,liver pancreas, gallbladder), and their functions, composition of different digestive juices & their functions. Digestion and absorption of carbohydrate, protein and fat. **2. Excitable cells**	Online Lecture method, PDF	Assignments	20hrs	JuthiSaha BikashMajumder

			• Brief description about the mechanism of muscular contraction. Neuro-muscular transmission. **3.Regulatory systems** • General idea about the Hormones in human body and their significance on nutrition. Brief idea about brain and sinal cord. somatic and autonomic control of body.			10hrs	
		FNTGCOR02P: HUMAN BODY AND NUTRITION (PRACTICAL)	1. Determination of Bleeding Time (BT) and Clotting Time (CT). 2. Detection of Blood group (Slide method).	Offline hands on practical	Assignments	6hrs 6hrs	BikashMajumder

Recommended Text books:

For FNTACOR03T:

1. Fennema, Owen R (1996), Food Chemistry, 3rd Ed., Marcell Dekker, New York.

2. Murray, R. K. Grannen, D. K.; Mayes, P. A. and Rodwell. V. W: Harper's Biochemistry. Lange Medical Book.

3. Potter,N.N.andHotchkiss,J.H (1995), Food Science, 5th Ed., Chapman & Hall.

4. Lehninger, A.L.; Nelson, D. L. and Cox, M. M. Principles of Biochemistry. CBS Publishers and Distributors.

5. A.C Deb, (2001) Fundamental of Biochemistry, New Central Book Agency (p) Ltd; 9th edition.

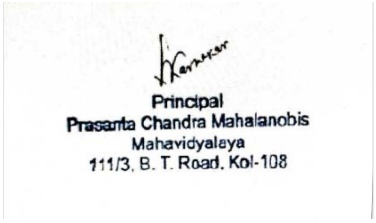
6. Debajyoti Das, Biochemistry, 14th Ed, Academic publishers.

For FNTACOR4T and FNTGCOR02T:

1. Berne, R. M., Koeppen, B. M., & Stanton, B. A. (2010). *Berne & Levy physiology*. Philadelphia, PA: Mosby/Elsevier.

2. Barrett, K. E., &Ganong, W. F. (2012). *Ganong's review of medical physiology*. New York: McGraw-Hill Medical.

3. Hall, J. E., & Guyton, A. C. (2011). *Guyton and Hall textbook of medical physiology*. Philadelphia, PA: Saunders Elsevier.



Prasanta Chandra MahalanobisMahavidyalaya

Lesson Plan- 2020-21

Semester IV Honors. &Programme Course

Name of the Department: ___Food and Nutrition_____

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted	Name of the Teacher assigned

						in hours	
February-April	**Hons**	**FNTACOR08T: COMMUNITY NUTRITION (THEORY)**	1.**Concept on Community** • Concept of Community, types of Community, Factors affecting health of the Community. **1.Nutritional Assessment and Surveillance** Nutritional Assessment and Surveillance: Meaning, need, objectives and importance. **3.Assessment methods for human** Nutritional assessment of human: Clinical findings, nutritional anthropometry, biochemical tests, biophysical methods. 4.**Diet survey** • Diet survey: Need and importance • Methods of dietary survey, Interpretation - concept of consumption unit, individual and total distribution of food in family, adequacy of diet in respect to RDA, • Concept of family food security.	Online class. Powerpoint Presentation and Lecture. E resources (E-PG path Sala) Study materials as pdf	Class assignment	6hrs 6hrs 10hrs 12hrs	Dr. GuddiTiwary
		FNTACOR08P: COMMUNITY NUTRITION (PRACTICAL)	1. Anthropometric Measurement of infant - Height, weight, circumference of chest, mid - upper arm circumference, precautions to be taken. 2. Comparison with norms and interpretation of the nutritional assessment data and its significance. Weight for age, height for age, weight for height, Z scores, body Mass Index (BMI) Waist - Hip Ratio (WHR).	Online practical demonstration, graphical interpretation,	Class assignment ,student seminar	10hrs 10hrs	Dr. GuddiTiwary

			3. Growth charts - plotting of growth charts, growth monitoring and promotion.			6hrs	
		FNTACOR09T: EPIDEMIOLOGY AND PUBLIC HEALTH(THEORY)	**1. Introduction on Health** • Health and its importance: Definition of health (WHO), Dimension of health, Positive health. • Determinants of health. Concept of disease and its causations. 2. **Data of Community health** • Secondary sources of community health data: Indicators of health. • Secondary sources of data from NFHS, Vital Statistics, Census of India, ICMR. **3.Epidemiology** • Definition of epidemiology, components and aims of epidemiology, basic measurements in epidemiology. • Demography and family planning. Brief idea about epidemics, epidemiological methods: analytical epidemiology (case control and cohort study); Experimental epidemiology. • Infectious diseases in epidemiology. Dynamics of disease transmission, modes of transmission of disease. **4.Public health** • Definition of public health, relation between health and nutrition.	Audio recorded Lecture , PDF, WHO website e-material, Indian Academy of Pediatrics e - material	Assignments	6hrs 6hrs 10hrs 6hrs	Dr. GuddiTiwary
		FNTACOR09P: EPIDEMIOLOGY AND PUBLIC HEALTH(PRACTICAL)	1. Preparation of 3 audio visual aids like charts, posters, models related to health and nutrition education. 2. Formulation and	Online demonstration on practical	Assignment	20hrs	Dr. GuddiTiwary

			preparation of low cost and medium cost nutritious/ supplementary recipe.			15hrs	
		FNTACOR10T: DIET THERAPY FOR LIFE STYLE DISORDERS(THEORY)	**1. Lifestyle disorder** • Introduction, types, aetiology, management. 2. **Diabetes Mellitus** • Definition, Etiology, Classification, long and short term complications, • Diagnosis, Management (Insulin Therapy, • Dietary Management with food exchange list, Exercise,Pharmacological), • Role of artificial sweeteners. • Overview of special conditions: Diabetes in Childhood, Pregnancy, • Role of Nutrition Education, • Role of Nutrition in Prevention. **3.Cardiovascular diseases** • Prevalence, incidence, mortality with special reference to Indian situation. • Patho - physiology and Management of Atherosclerosis, Endothelial dysfunction, Thrombosis, Angina Pectoris, Congestive cardiac failure, stroke, MI. • Hyper-lipidemia– classification, diagnosis and nutritional management, • Hypertension: Aetiology, Risk factors, Patho-physiology, Management **4.Nutrition and respiratory health** • Physiology and functions of the respiratory system, • Nutritional management of Asthma	Audio recorded Lecture,presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh	Assignment	4hrs 15hrs 12hrs 6hrs	JuthiSaha Dr. Priyadarshini Chakraborty

		FNTACOR10P: DIET THERAPY FOR LIFE STYLE DISORDERS(PRACTICAL)	Planning and preparation of Diets for the following diseases: i) Obesity and Underweight ii) Diabetes mellitus iii) Hypertension and Atherosclerosis	Online demonstration on practical class	Assignment	20hrs	JuthiSaha
	Hons and Programme course	**FNTSSEC02M: FIELD STUDY IN CLINICAL / COMMUNITY SETTING**	**Theory:** Introduction to clinical nutrition, clinical conditions requiring dietary intervention,	Lecture online mode, Study materials as pdf	Class assignment	5hrs	Dr. GuddiTiwary
			Practical: 1. Visit to an ongoing program in ICDS: one rural, one urban. (eg.mahilamandal meeting or nutrition week celebration 2. Visit to a health centre (ANC clinic run by Government health department and observe quality of counseling imparted to pregnant women (especially awareness of anemia, importance of IFA). 3. To visit an NGO either rural or urban and observe one intervention program implemented for 59 women, school children or adolescence (For all the above observation appropriate observation check lists will be made and used)	Lecture online mode,Practical demonstration at Virtual mode. Study materials as pdf.	Demonstration of teaching aids, student seminar, assignment	10hrs	Dr. GuddiTiwary
	Programme Course	**FNTGCOR04T: DIETETICS (THEORY)**	**1. Concept on Diet therapy** • Definition and objective of dietetics, Definition- diet therapy, • Dieticians;principles and classification of the therapeutic diet. Responsibility of dieticians. 2. **RDA, Meal planning and**	Lecture online mode, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh	Assignment	8hrs 12 hrs	JuthiSaha

			Dietary guidelines RDA- Definition, Nutritional requirements (RDA), Principles and objectives of meal planning, Dietary guidelines of pregnant & lactating women, infants(Weaning, supplementary food), pre-school children & school children(School lunch programme), adult males and females, old age people. 3. **Hospital diet** Hospital diet: regular, soft, fluid, special feeding methods- advantages, disadvantages			8hrs	
		FNTGCOR04P: DIETETICS(PRACTICAL)	Planning and Preparation of fluid diet, soft and solid diet.	Online demonstration on practical class	Assignment	20hrs	JuthiSaha
May-June	**Hons**	**FNTACOR08T: COMMUNITY NUTRITION (THEORY)**	1.**Clinical Signs** • Clinical Signs: Need and importance, • Identifying signs of PEM, vitamin A deficiency and iodine deficiency, • Interpretation of descriptive list of clinical signs. • Nutritional anaemia. Rickets, B-Complex deficiencies. **2. Nutritional anthropometry** • Nutritional anthropometry:Need and importance, • standard for reference, techniques of measuring height, weight, head, chest and arm circumference, • Interpretation of these measurements. • Growth & Development; • Body Composition: Changes through lifecycle • Use of growth charts.	Online class. Powerpoint Presentation and Lecture. E resources (E-PG path Sala) Study materials as pdf	Class assignment	8hrs 8hrs	Dr. GuddiTiwary

			3. **Agencies and programmes** • International, national, regional agencies and organizations. • National nutritional intervention programmes to combat malnutrition:ICDS, Midday meal, Special nutrition program, • National programs for prevention of anaemia, Vitamin A deficiency and Iodine deficiency disorders.			15hrs	
		FNTACOR08P: COMMUNITY NUTRITION (PRACTICAL)	1. Clinical assessment and signs of nutrient deficiencies specially PEM (Kwashiorkor, marasmus) I vitamin A deficiencies, Anaemia, Rickets, B-Complex deficiencies. 2. Estimation of food and nutrient intake: Household food consumption data, adult consumption unit, 24 hours dietary recall 24 hours record, Weighment method, food diaries, food frequency data, use of each of the above, information available through each individual, collection of data, estimation of intakes.	Online demonstration on practical, graphical interpretation,	Class assignment, ppt presentation in student seminars, demonstration of audiovisual aids for community	10hrs 10hrs	Dr. GuddiTiwary
		FNTACOR09T: EPIDEMIOLOGY AND PUBLIC HEALTH(THEORY)	1**. Immunization** • Immunization : definition. Host defenses and immunity, immunizing agents: its types, national immunization schedule- its importance, immunization in adults and travellers, hazards of immunization health advice to foreign travelers **2. Community health care** • Health care of the community, health care delivery, health care system, Primary health care in India,	Lecture in virtual mode, PDF, WHO website e-material, Indian Academy of Pediatrics e - material Lecture in virtual mode, PPT, Study material and E-book, text book referred.	Assignment	8hrs 5hrs	Dr. GuddiTiwary

			Indian public health standards for subcenters, PHCs, community health centers.Hospital waste management. **3. Community water management** • Community water management: importance of water to the community, sources of water. Concept of water pollution. Purification of water in small and large scale. Drinking water handling and safe drinking water			6hrs	
		FNTACOR09P: EPIDEMIOLOGY AND PUBLIC HEALTH(PRACTICAL)	1. Field visit (health centre, immunization centre, ICDS, MCH centre, NGOs etc.)	Online demonstration	Student Seminar	20hrs	Dr. GuddiTiwary
		FNTACOR10T: DIET THERAPY FOR LIFE STYLE DISORDERS(THEORY)	**1. Weight management** • Obesity and Overweight: Body weight components, • Classification of obesity,(gynoid/android and Regulation hypertrophy/hypersplasia, • Etiology and assessment of obesity and prevalence in Indian situation, • Complications of obesity. • Management: Medical (Pharmacological), Nutrition and lifestyle, Surgical, Behavioral Juvenile Obesity. • Underweight: Etiology ,Diet management, • Eating disorders: (Anorexia Nervosa and Bulimia), • Management (Medical, Nutritional care), Psychological support and Prevention. **2.Nutrition and respiratory health** • Physiology and functions of the respiratory system, • Nutritional management of	Lecture in virtual mode, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh	Assignment	15hrs 6hrs	JuthiSaha

			Asthma				
		FNTACOR10P: DIET THERAPY FOR LIFE STYLE DISORDERS(PRACTICAL)	• Planning and preparation of Diets for the following diseases: i) Overweight and Underweight ii) Gout iii) Osteoporosis	Online practical class	Assignment	20hrs	JuthiSaha
	Hons and Programme course	**FNTSSEC02M: FIELD STUDY IN CLINICAL / COMMUNITY SETTING**	**Theory:** Role of dietitian in hospitals/clinics, staff training, RD –requirements, procedure, functioning.	Lecture in virtual mode Study materials as pdf	Class assignment	5hrs	Dr. GuddiTiwary
			Practical: 1. Visit to old age home/Nutrition Rehabilitation Centre/slum area and prepare report on nutritional status /health concern(at least 10 case studies to be done) 2. Internship in any hospital/nursing home -case study of diseases 3. Preparation of visual aids indicating clinical problems related to nutrition – Charts, posters, models etc. and demonstration	Lecture in virtual mode Study materials as pdf . Provided standardized proforma and checklists, graphical representation of observations by demonstrating IEC materials of WHO, ICMR, NIN, CFTRI etc. Teaching aids developed under guidance	Demonstration of teaching aids, student seminar, assignment	10hrs	Dr. GuddiTiwary
	Programme Course	**FNTGCOR04T: DIETETICS (THEORY)**	**1. Dietary management of different diseases** • Dietary management in Gastro intestinal diseases (diarrhoea, constipation, gastritis, peptic ulcer &flatulence), Fever (short term), Diabetes mellitus (Type II - NIDDM), Heart diseases (hypertension, atherosclerosis, hyperlipidaemia), Liver diseases (infective hepatitis, cirrhosis of liver), Gout, Obesity (including assessment indices), Underweight. 2. **Food Allergy** • Food allergy- Definition,	Audio recorded Lecture, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh	Assignment	24hrs 8hrs	JuthiSaha

			sources, symptoms, diagnosis, treatment, food intolerance				
		FNTGCOR04P: DIETETICS(PRACTICAL)	1. Planning & preparation of a day's diet for the following conditions: Peptic ulcer, Fever, Hypertension, Diabetes mellitus (Type II NIDDM), Hepatitis, Obesity.	Online practical Class demonstration	Assignment	25hrs	Ms. JuthiSaha

Recommended Text books:

For FNTACOR08T:

1) Das Suryatapa. Textbook of community nutrition.4th Edition. Academic Publishers.
2) Park: Park's Textbook of preventive and Social Medicine. 9th edition. M/s. BanarasidasBhanot. Jabalpur.
3) Gopalon. C. : Nutrition Foundation of India, Special Publication service.
4) Beghin, 1. Cap. M: Dujardan. B. : A Guide to Nutrition Status Assessment. W.H.O. Geneva.
5) Gopaldas, t. Seshadri, S. : Nutrition Monitoring a Assessment: Oxford University Press. 7. Mason, J. B., Habicht, J. P.; Tabatabai. H. Valverde. U.: Nutritional Surveillance, W.H.O.
6) Jelliffe, D. B. : Assessment of the Nutritional Status of the Community; World Health Organisation.

For FNTACOR09T:

1.Park: Park's Textbook of preventive and Social Medicine. 9th edition.M/s. BanarasidasBhanot. Jabalpur.

For FNTACOR10T:

1. Anderson, L., Dibble, M.V., tukki, P.R., Mitchall, H.S., and Rynbergin H.J.: Nutrition in Health and Disease, 17th edition, J. B. Lipincott& Co. Philadelphia.

2. Anita F. P.: Clinical Dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.

3. Mahan, L. K., Arlin, M. T.: Krause's Food, Nutrition and Diet Therapy. 8th edition, W. B. Saunders Company, London.

4. Williams. S. R.: Nutrition & Diet Therapy, 6th edition, Times Mirror/Mosby College Publishings, St. Louis.

5. Raheena, Begum: A textbook of food, nutrition and dietetics Sterling Publishers, New Delhi.

6. Joshi, S. A. : Nutrition and Dietetics, Tata McGraw Hill, Publications, New Delhi.

For FNTGCORO4T:

1. Anderson, L., Dibble, M.V., tukki, P.R., Mitchall, H.S., and Rynbergin H.J.: Nutrition in Health and Disease, 17th edition, J. B. Lipincott& Co. Philadelphia.

2. Anita F. P.: Clinical Dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.

3. Mahan, L. K., Arlin, M. T.: Krause's Food, Nutrition and Diet Therapy. 8th edition, W. B. Saunders Company, London.

4. Williams. S. R.: Nutrition & Diet Therapy, 6th edition, Times Mirror/Mosby College Publishings, St. Louis.

5. Raheena, Begum: A textbook of food, nutrition and dietetics Sterling Publishers, New Delhi.

6. Joshi, S. A. : Nutrition and Dietetics, Tata McGraw Hill, Publications, New Delhi.

Prasanta Chandra MahalanobisMahavidyalaya

Lesson Plan- 2019-2020

PARTIII Honors. &Programme Course

Name of the Department: _Food and Nutrition _____

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
February-June	**Hons**	**Paper V: Unit I** **NUTRITIONAL BIOCHEMISTRY**	2.**CARBOHYDRATES;** Glycolysis.Citric acid cycle, electron transport chain (brief idea), glycogenolysis, gluconeogenesis, HMP Shunt. **3.PROTEIN** Tertiary &Quarternary structures of protein with Haemoglobin& Collagen as examples, Deamination& Transamination, amino acid metabolism. **6. VITAMINS;** Structure & Biochemical roles, Deficiency disorders of Vitamin A, D, E, K, B1, B2, B6, Folic acid, Pantothenic acid, Niacin & Vitamin C. **7. MINERALS:** Biochemical functions of Na, K, Ca, P, I, Fe,Se-Disordersrelated to	Audio recorded Lecture,power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh;	Assignment/ class tests	4hrs 12hrs	Dr. Priyadarshini Chakraborty Dr. Priyadarshini Chakraborty JuthiSaha

			Hyperactivity & Deficiencies of those elements. **8. CELLULAR TRANSPORT:** Preliminary idea about membrane permeability, Active & Passive transport, Facilitated transport, a brief idea about gated channels & membrane –bound transport protein.			4 hrs 4hrs	Dr. Priyadarshini Chakraborty
		Paper V **Unit II: Microbiology**	**5.Morphology of Bacteria-** Slime layer, capsule, cell wall, flagella, pilli, fimbriae, cell membrane, ribosome, cytoplasmic inclusions (inorganic), endospore(structure, formation and germination. 6. Control of microbes- Sterilization, Disinfection, Antiseptics, detergents, methods of sterilization- Pysical (heat, low temp, radiation, filtration), Chemical (alcohol, phenol, halogen, heavy metals, formaldehyde). 7. **Food Microbiology-** milk as a growth medium of bacteria, normal	ICT,Lecture method; power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh; video demonstrations	Assignment/ class tests	4hrs 4hrs	Dr. Priyadarshini Chakraborty

			microflora in milk, undesirable microbes in milk, Pasteurization, phosphatase test, Methylene blue reduction test. Normal microflora of vehgetables& fruits, meat, fish, egg, canned food, cereal & cereal products, enumeration of microbespresent in food& milk. Outline of methods for detection of microorganisms in drinking ater (presumptive, confirmatory and completed test), distinction between faecal and non faecal coliforms- IMVic test. Extrinsic & intrinsic parameters affecting growth & survival of microbes. **8. Food borne diseases-** Food borne infection & intoxication. Different food borne diseases like Shigellosis, salmonellosis, Clostridium Perfringens food poisoning, Typhoid, E.Coli food poisoning, Bacillus cereus food poisoning- causative agent, symptoms, pathogenicity & preservation			4hrs 8hrs	
		Paper VI (Unit I: DIET THERAPY	6. Diseases of liver- General introduction , Symptoms of liver diseases, Reasons of liver	Audio recording Lecture method,	Assignment/ class tests/practical	10hrs	JuthiSaha

			diseases, Basic idea of liver function tests, Causes , clinical features , treatment & dietary management of – Infective hepatitis & jaundice, Cirrhosis of liver, Hepatic coma, Infantile biliary cirrhosis. 7. GALL STONE DISEASE- General Introduction, Type of Stones, Dietary management. 8. PEPTIC ULCER- General introduction of peptic ulcer disease. Causes of peptic ulcer disease, Mechanism of ulcer formation, symptoms of peptic ulcer disease, treatment & dietary management. 9. INTESTINAL DISORDERS- General introduction and dietary management of different intestinal disorders. Constipation- causes, complication, type(in brief), dietary management. Flatulence- causes, treatment, dietary management. Diarrhoea- causes, physiological isturbances in the body during Diarrhoea. Different types of Diarrhoea, Symptoms, Complication, Prevention& treatment. ORS. Steatorrhoea- causes, treatment, dietary management. Ulcerative colitis- causes , symptoms, treatment& dietary management. Irritable bowel syndrome- causes , symptoms, dietary	Google meet virtual class, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh, e-book	demonstration/notebooks	8hrs 8hrs	

			management.				
		Paper VI Unit – II: DIET THERAPY	3.Diabetes Mellitus- General introduction & Classification. Factors responsible for diabetes. Role of hormones, Characteristics of Type I & Type II diabetes. Treatment & dietary management of diabetes, Complications associated with it. 4. FOOD ALLERGY; Introduction & definition related to food allergy, Predisposing factors of food allergy. Reasons for allergy. Classification of allergy. Allergic reaction (elementary idea), Symptoms of allergy, Role of food as allergen, Treatment & dietary management of food allergy, with elimination diet	Audio recording Lecture method, Google meet virtual class, power point presentation and e-resources	Assignment	15hrs	Dr. Priyadarshini Chakraborty

		PAPER VII UNIT I: BIOCHEMISTRY PRACTICAL	GROUP A- QUALITATIVE ESTIMATION- 3. Qualitative estimation of fat. Solubility test, Unsaturation test, Saponifacation test, Test with soap &acrolin layer. 4. Chromatographic separaration of Amino acids from mixture of amino acids & determination of Rf value. GROUP B- QUANTITATIVE ESTIMATION: 6. Quantitative estimation of serum acid phosphatase 7. Quantitative estimation of serum alkaline phosphatase. 8. Quantitative estimation of Vitamin C in lemon juice. 9. Quantitative estimation of glucose using fehling solution 10. Determination o facid value of fat.	Audio recorded Lecture, power point presentation and Video demonstrations of practical.		10 hrs 10 hrs	Dr. Priyadarshini Chakraborty Dr. Priyadarshini Chakraborty

		PAPER VII- UNIT II- (FOOD PRESERVATION AND PREPARATION) PRACTICAL	3. Use of sun drying for preservation of food. 4. Preparation of fermented food product 5. Visit- Milk industry visit Food testing lab visit .	Audio recorded Lecture, power point presentation and Video demonstrations of practical. Virtual Lab visit conducted	Class assignments	12hrs	Dr. Priyadarshini Chakraborty
		PAPER VIII, UNIT-I: DIET THERAPY PRACTICAL	5.Planning and preparation of diets for the following condition- Jaundice, peptic ulcer, diabetes, Fever, CHD, Gout, Renal failure (acute	Online demonstration of practical	Assignment/ project report/ Notebooks	10hrs	JuthiSaha

			or chronic), Obesity.				
		PAPER VIII- UNIT II- MICROBIOLOGY	3. Inoculation of one gram positive and one gram negative bacteria 4.Gram staining	Online demonstration of practical	Assignment	6 hrs	Dr. Priyadarshini Chakraborty
		PAPER VIII- UNIT III- (PROJECT AND SEMINAR)	1. Review and Project work 2.Seminar presentation models related to health and nutrition education.	Preparation of chart/ poster preparation, and dissertation	Assignment	8 hrs	Dr. Priyadarshini Chakraborty Dr.GuddiTiwary

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Principal
Prasanta Chandra Mahalanobis
Mahavidyalaya
111/3, B. T. Road, Kol-108

	Programme course	**PAPER IV- UNIT-I (GROUP-A; COMMUNITY NUTRITION)**	3. Role of National & International organizations in improving community health- Who, FAO, UNICEF, CARE, NIN, CFTRI, ICMR. 5.Current National Nutrition Intervention Programmes in India- SNP, ANP, ICDS, Mi day meal, NIDDCP, NPPMB,NNAPP.	Audio recorded Lecture, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh;	Assignment	15 hrs	JuthiSaha
		PAPER IV- UNIT-I (GROUP B- FOOD MICROBIOLOGY &SANITATION)	3. Food borne infections and infestations. Causative organisms, Symptoms, Mode of transmission, method of preservation. 5. Food adulteration- Definition, types, Introduction to food standards and food laws- PFA Act, AGMARK, PFO, MPO, Codex Allimeterious, Consumer Protection Act, HACCP				Dr. Priyadarshini Chakraborty

		PAPER IV-UNIT-II (PRACTICAL)	2.Pllotting of growth chart 3.Identification of unknown microbes (prepared slides)	Online demonstration of practical	Assignment	10hrs	Dr. GuddiTiwary

Recommended Text books:

For FNTACOR13T:

1.Subalakshmi, G and Udipi (2001), S.A. Food processing and preservation; New Age International Publishers, New Delhi.

2. Srilakshmi, B. (2003), Food Science. New Age International Publishers, New Delhi.

3. Potter, N.N. and Hotchkiss J. H. (1996), Food Science. CBS publishers and distributors.

4. Srivastava, R.P.O. and Kumar, S. (1994) Fruit and vegetable preservation, International Book distribution Company, Lucknow.

5. MC Williams, M and Paine, H. (1994), Modern Food preservation.Surjeet Publications, Delhi.

6. Cruess, W.V.(1997), Commercial Fruits and Vegetable Products, Anees Offset press, New Delhi.

For FNTACOR14T:

1. Kothari C R(2004) Research Methodology, Methods &Techniques, 2nd Edi. New Age International Publishers.
2. Mahanjan BK (2010) Methods in Biostatistics, 7th Edi, Jaypee Brothers Medical Publishers (P) LTD.
3. Gun AM, Gupta MK,DasGupta b. (2008). Fundamentals of Statistics, 8th Edi, World press.
4. Malhotra OP, Gupta SK (1990) Elementary Statistics , 5thedi., S chand and Company.

For FNTADSE04T:

1. West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition Revised ByHargar FV, Shuggart SG, &Palgne Palacio June, Macmillan Publishing Company New York.
2. SethiMohini (2005) Institution Food Management New Age International Publishers
3. Knight J B &Kotschevar LH (2000) Quantity Food Production Planning & Management 3rd edition John Wiley & Sons
4. Philip E Thangam (2008) Modern Cookery for teaching and Trade Part I & II Orient Longmam
5. Taneja S and Gupta SL (2001) Enterpreneurship development, Galgotia Publishing

For FNTADSE05T:

1. Webb and Johnson (1988), Fundamentals of Dairy Chemistry, 3rd ed., CBS Publishers, New Delhi.
2. Pieter Walstra Jan T. M. Wouters Tom J. Geurts (2006), Dairy Science and Technology, Second Edition, CRC Press, Tayor and Francis group.
3. M.P.Mathur, D.D.Roy&P.Dinakar (2008), Textbook of Dairy Chemistry, Published by ICAR.

For FNTGDSE03T:

1. Manay NS, Shadaksharaswamy M. (2008) Foods facts and Principles, 3rdedi., New Age International (p) limited , publishers.

Recommended Text books:

For PAPER V & VII:

1. Lehninger, A.L.; Nelson, D. L. and Cox, M. M. Principles of Biochemistry. CBS Publishers and Distributors.
2. A.C Deb, (2001) Fundamental of Biochemistry, New Central Book Agency (p) Ltd; 9th edition.
3. Debajyoti Das, Biochemistry, 14th Ed, Academic publishers.
4. Frazier, W. C. and Westhoff, D. C. (1988): 4th edition, Food Microbiology, MaGraw Hill Inc.
5. Jay James. N. (1986) : 3rd edition, modern Food Microbiology, Van Nestrand Reinhold Company Inc.
6. Pelczar, M.I. and Reid, K. D. (1978): Microbiology, McGraw Hill Company, New York.
7. Benson Harold, J. (1990) : Microbiological Application, Publishers, U.S.A.
8. Colling, C.E. and Lyne, P.M. (1976) : Microbiological Methods Butterworth. London
9. Jay JM, Modern Food Microbiology, CBS Publication New Delhi 3rd Ed. 1987

For PAPER VI :

Principal
Prasanta Chandra Mahalanobis
Mahavidyalaya
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1. Anderson, L., Dibble, M.V., tukki, P.R., Mitchall, H.S., and Rynbergin H.J.: Nutrition in Health and Disease, 17th edition, J. B. Lipincott& Co. Philadelphia.
2. Antia F. P.: Clinical Dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.
3. Mahan, L. K., Arlin, M. T.: Krause's Food, Nutrition and Diet Therapy. 8th edition, W. B. Saunders Company, London.

Prasanta Chandra MahalanobisMahavidyalaya

Lesson Plan- 2019-2020

Semester II Honours &Programme Course

Name of the Department: Food and Nutrition

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
March-April	**Hons.**	**FNTACORO03T -FOOD CHEMISTRY, BIOPHYSICS AND BIOCHEMICAL PRINCIPLES(THEORY)**	**1.Proteins and Amino acids-** • Classification of proteins. • Protein structure and organization: primary, secondary, tertiary and quaternary structure. • Amino acid classification. • Physical and chemical properties of amino acid and protein. • Biological value of proteins (BV), Net protein utilization (NPU) and Protein efficiency ratio (PER).	Online class. Powerpoint Presentation. Lecture. Board work. E-books, Study materials	Class Assignment	10hrs	Dr.PriyadarshiniChakraborty
			2.Carbohydrate Chemistry • Carbohydrates: classification- mono-, di- & polysaccharide • Stereoisomerism in carbohydrates. • Physical and chemical properties of mono-, di- and polysaccharides; • Dietary fibre - definition; Fibre components -	Online class. Powerpoint Presentation. Lecture. Board work, Study materials as pdf	Class Assignment	20hrs	JuthiSaha

			cellulose, hemicellulose, pectin substances, lignin.				
		FNTACOR03P: FOOD CHEMISTRY, BIOPHYSICS AND BIOCHEMICAL PRINCIPLES (PRACTICAL)	1. Qualitative tests for the identification of: Glucose, Galactose, Fructose, Sucrose, Lactose, Starch, Dextrin. 2. Glucose estimation in blood 3. Qualitative tests for the identification of - Albumin, Gelatin, Peptone, urea, uric acid.	Online practical class demonstration	Continuous assessment Continuous assessment Continuous assessment	10hrs 6hrs 15hrs	JuthiSaha
		FNTACOR04T: HUMAN PHYSIOLOGY (THEORY)	**1. Physiology of excitable cells:** • Different types of muscles and their structures • Mechanism of skeletal muscle contraction and relaxation, • Muscle energetic, • Isometric and isotonic muscle contraction. • Structure of nerves. • Nerve impulse and its conduction. • Synapse and Neuromuscular junctions. • Synaptic transmission. • Neutrotrophins	Online Lecture method; PDF	Assignments	25hrs	BikashMajumder
		FNTACOR04P: HUMAN PHYSIOLOGY (PRACTICAL)	1. Test for Visual acuity, Colour vision. 2. Identification with reasons of histological slides (Lung, Liver, Kidney,	Offline hands-on practical class	Assignments	10hrs 25hrs	BikashMajumder

			Smallintestine, Stomach, Thyroid, Adrenal, Pancreas, Testis, Ovary and Muscle of mammals).				
	Programme Course	**FNTGCOR02T: HUMAN BODY AND NUTRITION (THEORY)**	**1. Animal cell** • Animal cell: definition, structure and functions of different parts. Organelle **2. Blood and body Fluids:** • Blood, composition, blood corpuscles, functions, blood groups and its importance in transfusion, hazards of mismatch blood transfusion. Rh factor, blood coagulation. • Lymph: Compositionand function. **3. Cardiovascular and Respiratory system** • Heart: Junctionl tissues and functions. Cardiac cycle, cardiac output, blood pressure and its regulation. Mechanism of respiration, Respiratory centre. Respiratory regulation.	Lecture method; Chalkboard, PDF	Assignments	5hrs 10hrs 10 hrs	Dr.PriyadarshiniChakraborty BikashMajumder

		FNTGCOR02P: HUMAN BODY AND NUTRITION (PRACTICAL)	1. Determination of pulse rate in Resting condition and after exercise (30 beats/10 beats method) 2. Determination of blood pressure by Sphygmomanometer (Auscultatory method). 3. Identification of	Omline hands onpracticals	Assignments	6hrs 6hrs	BikashMajumder

			permanent sections (Blood cells, Stomach, Small intestine, large intestine, Liver, pancrea**s).**			6hrs	
May-June	**Hons.**	**FNTACORO03T -FOOD CHEMISTRY, BIOPHYSICS AND BIOCHEMICAL PRINCIPLES(THEORY)**	**1.Lipid Chemistry** • Lipids: Classification- Fatty acids, triglycerides, phospholipids, Glycolipids, sterols and steroids. Eiconoids. • Edible fats and oils - physical and chemical properties, Hydrogenation and importance of fats in the diet. • Physical and chemical properties of saturated, monounsaturated, polyunsaturated fatly acids, Trans fatty acids, phospholipids, cholesterols and liposomes. • Essential fatty acids. **2. Enzymes** • Enzmes: Definition and structure. • Enzyme substrate interaction. • Enzyme kinetics, • MichaelisMentenconstant(Km). • Enzyme inhibition • .Factors regulating enzyme activities, • Isoenzymes, Pro-enzymes, Ribozymes, Abzymes, • Concept of Rate limiting enzymes.	Online class. Powerpoint Presentation and Lecture. E-books, Study materials	Class assignment	15 hrs 10hrs	Dr. Priyadarshini Chakraborty
		FNTACOR03P: FOOD CHEMISTRY, BIOPHYSICS AND	1. Protein estimation by Biuret and Lowry methods. 2. Estimation of urea	Online Hands-on Practical Class	Class assignments	6hrs 6hrs	Dr. Priyadarshini Chakraborty

		BIOCHEMICAL PRINCIPLES(PRACTICAL)	and uric acid in blood. 3. Determination of acid value of oils by titrimetric method. 5. Determination of specific gravity of liquid (fruit juice, blood).			6hrs 6hrs	
		FNTACOR04T: HUMAN PHYSIOLOGY (THEORY)	**1.Endocrine system** • Structure, hormones and functions of pituitary, thyroid, parathyroid, adrenal gland and pancreas. • Hypothalamus as an endocrine gland. • Gastrointestinal hormones. Growth factors.	Lecture method; Chalkboard, PDF	Assignments	20hrs	BikashMajumder
		FNTACOR04P: HUMAN PHYSIOLOGY (PRACTICAL)	1. Qualitative determination of glucose in blood or urine. 2. Total count (TC) and Differential count (DC)	Online demonstration of practical	Assignments	10hrs	BikashMajumder
	Programme Course	**FNTGCOR02T: HUMAN BODY AND NUTRITION (THEORY)**	**1. Digestive system and Digestion** • Digestive system: Structures involved in digestive system (mouth, oesophagus, stomach, small intestine, large intestine,liver pancreas, gallbladder), and their functions, composition of different digestive juices & their functions. Digestion and absorption of carbohydrate, protein and fat. **2. Excitable cells**	Online Lecture method, PDF	Assignments	20hrs	JuthiSaha BikashMajumder

			• Brief description about the mechanism of muscular contraction. Neuro-muscular transmission. **3.Regulatory systems** • General idea about the Hormones in human body and their significance on nutrition. Brief idea about brain and sinal cord. somatic and autonomic control of body.			10hrs	
		FNTGCOR02P: HUMAN BODY AND NUTRITION (PRACTICAL)	1. Determination of Bleeding Time (BT) and Clotting Time (CT). 2. Detection of Blood group (Slide method).	Offline hands on practical	Assignments	6hrs 6hrs	BikashMajumder

Recommended Text books:

For FNTACOR03T:

1. Fennema, Owen R (1996), Food Chemistry, 3rd Ed., Marcell Dekker, New York.

2. Murray, R. K. Grannen, D. K.; Mayes, P. A. and Rodwell. V. W: Harper's Biochemistry. Lange Medical Book.

3. Potter,N.N.andHotchkiss,J.H (1995), Food Science, 5th Ed., Chapman & Hall.

4. Lehninger, A.L.; Nelson, D. L. and Cox, M. M. Principles of Biochemistry. CBS Publishers and Distributors.

5. A.C Deb, (2001) Fundamental of Biochemistry, New Central Book Agency (p) Ltd; 9th edition.

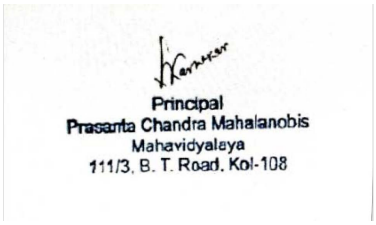
6. Debajyoti Das, Biochemistry, 14th Ed, Academic publishers.

For FNTACOR4T and FNTGCOR02T:

1. Berne, R. M., Koeppen, B. M., & Stanton, B. A. (2010). *Berne & Levy physiology*. Philadelphia, PA: Mosby/Elsevier.

2. Barrett, K. E., &Ganong, W. F. (2012). *Ganong's review of medical physiology*. New York: McGraw-Hill Medical.

3. Hall, J. E., & Guyton, A. C. (2011). *Guyton and Hall textbook of medical physiology*. Philadelphia, PA: Saunders Elsevier.



Prasanta Chandra MahalanobisMahavidyalaya

Lesson Plan- 2020-21

Semester IV Honors. &Programme Course

Name of the Department: ___Food and Nutrition_____

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted	Name of the Teacher assigned

						in hours	
February-April	**Hons**	**FNTACOR08T: COMMUNITY NUTRITION (THEORY)**	1.**Concept on Community** • Concept of Community, types of Community, Factors affecting health of the Community. **1.Nutritional Assessment and Surveillance** Nutritional Assessment and Surveillance: Meaning, need, objectives and importance. **3.Assessment methods for human** Nutritional assessment of human: Clinical findings, nutritional anthropometry, biochemical tests, biophysical methods. 4.**Diet survey** • Diet survey: Need and importance • Methods of dietary survey, Interpretation - concept of consumption unit, individual and total distribution of food in family, adequacy of diet in respect to RDA, • Concept of family food security.	Online class. Powerpoint Presentation and Lecture. E resources (E-PG path Sala) Study materials as pdf	Class assignment	6hrs 6hrs 10hrs 12hrs	Dr. GuddiTiwary
		FNTACOR08P: COMMUNITY NUTRITION (PRACTICAL)	1. Anthropometric Measurement of infant - Height, weight, circumference of chest, mid - upper arm circumference, precautions to be taken. 2. Comparison with norms and interpretation of the nutritional assessment data and its significance. Weight for age, height for age, weight for height, Z scores, body Mass Index (BMI) Waist - Hip Ratio (WHR).	Online practical demonstration, graphical interpretation,	Class assignment ,student seminar	10hrs 10hrs	Dr. GuddiTiwary

			3. Growth charts - plotting of growth charts, growth monitoring and promotion.			6hrs	
		FNTACOR09T: EPIDEMIOLOGY AND PUBLIC HEALTH(THEORY)	**1. Introduction on Health** • Health and its importance: Definition of health (WHO), Dimension of health, Positive health. • Determinants of health. Concept of disease and its causations. 2. **Data of Community health** • Secondary sources of community health data: Indicators of health. • Secondary sources of data from NFHS, Vital Statistics, Census of India, ICMR. **3.Epidemiology** • Definition of epidemiology, components and aims of epidemiology, basic measurements in epidemiology. • Demography and family planning. Brief idea about epidemics, epidemiological methods: analytical epidemiology (case control and cohort study); Experimental epidemiology. • Infectious diseases in epidemiology. Dynamics of disease transmission, modes of transmission of disease. **4.Public health** • Definition of public health, relation between health and nutrition.	Audio recorded Lecture , PDF, WHO website e-material, Indian Academy of Pediatrics e - material	Assignments	6hrs 6hrs 10hrs 6hrs	Dr. GuddiTiwary
		FNTACOR09P: EPIDEMIOLOGY AND PUBLIC HEALTH(PRACTICAL)	1. Preparation of 3 audio visual aids like charts, posters, models related to health and nutrition education. 2. Formulation and	Online demonstration on practical	Assignment	20hrs	Dr. GuddiTiwary

			preparation of low cost and medium cost nutritious/ supplementary recipe.			15hrs	
		FNTACOR10T: DIET THERAPY FOR LIFE STYLE DISORDERS(THEORY)	**1. Lifestyle disorder** • Introduction, types, aetiology, management. 2. **Diabetes Mellitus** • Definition, Etiology, Classification, long and short term complications, • Diagnosis, Management (Insulin Therapy, • Dietary Management with food exchange list, Exercise,Pharmacological), • Role of artificial sweeteners. • Overview of special conditions: Diabetes in Childhood, Pregnancy, • Role of Nutrition Education, • Role of Nutrition in Prevention. **3.Cardiovascular diseases** • Prevalence, incidence, mortality with special reference to Indian situation. • Patho - physiology and Management of Atherosclerosis, Endothelial dysfunction, Thrombosis, Angina Pectoris, Congestive cardiac failure, stroke, MI. • Hyper-lipidemia– classification, diagnosis and nutritional management, • Hypertension: Aetiology, Risk factors, Patho-physiology, Management **4.Nutrition and respiratory health** • Physiology and functions of the respiratory system, • Nutritional management of Asthma	Audio recorded Lecture,presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh	Assignment	4hrs 15hrs 12hrs 6hrs	JuthiSaha Dr. Priyadarshini Chakraborty

		FNTACOR10P: DIET THERAPY FOR LIFE STYLE DISORDERS(PRACTICAL)	Planning and preparation of Diets for the following diseases: i) Obesity and Underweight ii) Diabetes mellitus iii) Hypertension and Atherosclerosis	Online demonstration on practical class	Assignment	20hrs	JuthiSaha
	Hons and Programme course	**FNTSSEC02M: FIELD STUDY IN CLINICAL / COMMUNITY SETTING**	**Theory:** Introduction to clinical nutrition, clinical conditions requiring dietary intervention,	Lecture online mode, Study materials as pdf	Class assignment	5hrs	Dr. GuddiTiwary
			Practical: 1. Visit to an ongoing program in ICDS: one rural, one urban. (eg.mahilamandal meeting or nutrition week celebration 2. Visit to a health centre (ANC clinic run by Government health department and observe quality of counseling imparted to pregnant women (especially awareness of anemia, importance of IFA). 3. To visit an NGO either rural or urban and observe one intervention program implemented for 59 women, school children or adolescence (For all the above observation appropriate observation check lists will be made and used)	Lecture online mode,Practical demonstration at Virtual mode. Study materials as pdf.	Demonstration of teaching aids, student seminar, assignment	10hrs	Dr. GuddiTiwary
	Programme Course	**FNTGCOR04T: DIETETICS (THEORY)**	**1. Concept on Diet therapy** • Definition and objective of dietetics, Definition- diet therapy, • Dieticians;principles and classification of the therapeutic diet. Responsibility of dieticians. 2. **RDA, Meal planning and**	Lecture online mode, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh	Assignment	8hrs 12 hrs	JuthiSaha

			Dietary guidelines RDA- Definition, Nutritional requirements (RDA), Principles and objectives of meal planning, Dietary guidelines of pregnant & lactating women, infants(Weaning, supplementary food), pre-school children & school children(School lunch programme), adult males and females, old age people. 3. **Hospital diet** Hospital diet: regular, soft, fluid, special feeding methods- advantages, disadvantages			8hrs	
		FNTGCOR04P: DIETETICS(PRACTICAL)	Planning and Preparation of fluid diet, soft and solid diet.	Online demonstration on practical class	Assignment	20hrs	JuthiSaha
May-June	**Hons**	**FNTACOR08T: COMMUNITY NUTRITION (THEORY)**	1.**Clinical Signs** • Clinical Signs: Need and importance, • Identifying signs of PEM, vitamin A deficiency and iodine deficiency, • Interpretation of descriptive list of clinical signs. • Nutritional anaemia. Rickets, B-Complex deficiencies. **2. Nutritional anthropometry** • Nutritional anthropometry:Need and importance, • standard for reference, techniques of measuring height, weight, head, chest and arm circumference, • Interpretation of these measurements. • Growth & Development; • Body Composition: Changes through lifecycle • Use of growth charts.	Online class. Powerpoint Presentation and Lecture. E resources (E-PG path Sala) Study materials as pdf	Class assignment	8hrs 8hrs	Dr. GuddiTiwary

			3. **Agencies and programmes** • International, national, regional agencies and organizations. • National nutritional intervention programmes to combat malnutrition:ICDS, Midday meal, Special nutrition program, • National programs for prevention of anaemia, Vitamin A deficiency and Iodine deficiency disorders.			15hrs	
		FNTACOR08P: COMMUNITY NUTRITION (PRACTICAL)	1. Clinical assessment and signs of nutrient deficiencies specially PEM (Kwashiorkor, marasmus) I vitamin A deficiencies, Anaemia, Rickets, B-Complex deficiencies. 2. Estimation of food and nutrient intake: Household food consumption data, adult consumption unit, 24 hours dietary recall 24 hours record, Weighment method, food diaries, food frequency data, use of each of the above, information available through each individual, collection of data, estimation of intakes.	Online demonstration on practical, graphical interpretation,	Class assignment, ppt presentation in student seminars, demonstration of audiovisual aids for community	10hrs 10hrs	Dr. GuddiTiwary
		FNTACOR09T: EPIDEMIOLOGY AND PUBLIC HEALTH(THEORY)	1**. Immunization** • Immunization : definition. Host defenses and immunity, immunizing agents: its types, national immunization schedule- its importance, immunization in adults and travellers, hazards of immunization health advice to foreign travelers **2. Community health care** • Health care of the community, health care delivery, health care system, Primary health care in India,	Lecture in virtual mode, PDF, WHO website e-material, Indian Academy of Pediatrics e - material Lecture in virtual mode, PPT, Study material and E-book, text book referred.	Assignment	8hrs 5hrs	Dr. GuddiTiwary

			Indian public health standards for subcenters, PHCs, community health centers.Hospital waste management. **3. Community water management** • Community water management: importance of water to the community, sources of water. Concept of water pollution. Purification of water in small and large scale. Drinking water handling and safe drinking water			6hrs	
		FNTACOR09P: EPIDEMIOLOGY AND PUBLIC HEALTH(PRACTICAL)	1. Field visit (health centre, immunization centre, ICDS, MCH centre, NGOs etc.)	Online demonstration	Student Seminar	20hrs	Dr. GuddiTiwary
		FNTACOR10T: DIET THERAPY FOR LIFE STYLE DISORDERS(THEORY)	**1. Weight management** • Obesity and Overweight: Body weight components, • Classification of obesity,(gynoid/android and Regulation hypertrophy/hypersplasia, • Etiology and assessment of obesity and prevalence in Indian situation, • Complications of obesity. • Management: Medical (Pharmacological), Nutrition and lifestyle, Surgical, Behavioral Juvenile Obesity. • Underweight: Etiology ,Diet management, • Eating disorders: (Anorexia Nervosa and Bulimia), • Management (Medical, Nutritional care), Psychological support and Prevention. **2.Nutrition and respiratory health** • Physiology and functions of the respiratory system, • Nutritional management of	Lecture in virtual mode, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh	Assignment	15hrs 6hrs	JuthiSaha

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			Asthma				
		FNTACOR10P: DIET THERAPY FOR LIFE STYLE DISORDERS(PRACTICAL)	• Planning and preparation of Diets for the following diseases: i) Overweight and Underweight ii) Gout iii) Osteoporosis	Online practical class	Assignment	20hrs	JuthiSaha
	Hons and Programme course	**FNTSSEC02M: FIELD STUDY IN CLINICAL / COMMUNITY SETTING**	**Theory:** Role of dietitian in hospitals/clinics, staff training, RD –requirements, procedure, functioning.	Lecture in virtual mode Study materials as pdf	Class assignment	5hrs	Dr. GuddiTiwary
			Practical: 1. Visit to old age home/Nutrition Rehabilitation Centre/slum area and prepare report on nutritional status /health concern(at least 10 case studies to be done) 2. Internship in any hospital/nursing home -case study of diseases 3. Preparation of visual aids indicating clinical problems related to nutrition – Charts, posters, models etc. and demonstration	Lecture in virtual mode Study materials as pdf . Provided standardized proforma and checklists, graphical representation of observations by demonstrating IEC materials of WHO, ICMR, NIN, CFTRI etc. Teaching aids developed under guidance	Demonstration of teaching aids, student seminar, assignment	10hrs	Dr. GuddiTiwary
	Programme Course	**FNTGCOR04T: DIETETICS (THEORY)**	**1. Dietary management of different diseases** • Dietary management in Gastro intestinal diseases (diarrhoea, constipation, gastritis, peptic ulcer &flatulence), Fever (short term), Diabetes mellitus (Type II - NIDDM), Heart diseases (hypertension, atherosclerosis, hyperlipidaemia), Liver diseases (infective hepatitis, cirrhosis of liver), Gout, Obesity (including assessment indices), Underweight. 2. **Food Allergy** • Food allergy- Definition,	Audio recorded Lecture, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh	Assignment	24hrs 8hrs	JuthiSaha

			sources, symptoms, diagnosis, treatment, food intolerance				
		FNTGCOR04P: DIETETICS(PRACTICAL)	1. Planning & preparation of a day's diet for the following conditions: Peptic ulcer, Fever, Hypertension, Diabetes mellitus (Type II NIDDM), Hepatitis, Obesity.	Online practical Class demonstration	Assignment	25hrs	Ms. JuthiSaha

Recommended Text books:

For FNTACOR08T:

1) Das Suryatapa. Textbook of community nutrition.4th Edition. Academic Publishers.
2) Park: Park's Textbook of preventive and Social Medicine. 9th edition. M/s. BanarasidasBhanot. Jabalpur.
3) Gopalon. C. : Nutrition Foundation of India, Special Publication service.
4) Beghin, 1. Cap. M: Dujardan. B. : A Guide to Nutrition Status Assessment. W.H.O. Geneva.
5) Gopaldas, t. Seshadri, S. : Nutrition Monitoring a Assessment: Oxford University Press. 7. Mason, J. B., Habicht, J. P.; Tabatabai. H. Valverde. U.: Nutritional Surveillance, W.H.O.
6) Jelliffe, D. B. : Assessment of the Nutritional Status of the Community; World Health Organisation.

For FNTACOR09T:

1.Park: Park's Textbook of preventive and Social Medicine. 9th edition.M/s. BanarasidasBhanot. Jabalpur.

For FNTACOR10T:

1. Anderson, L., Dibble, M.V., tukki, P.R., Mitchall, H.S., and Rynbergin H.J.: Nutrition in Health and Disease, 17th edition, J. B. Lipincott& Co. Philadelphia.

2. Anita F. P.: Clinical Dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.

3. Mahan, L. K., Arlin, M. T.: Krause's Food, Nutrition and Diet Therapy. 8th edition, W. B. Saunders Company, London.

4. Williams. S. R.: Nutrition & Diet Therapy, 6th edition, Times Mirror/Mosby College Publishings, St. Louis.

5. Raheena, Begum: A textbook of food, nutrition and dietetics Sterling Publishers, New Delhi.

6. Joshi, S. A. : Nutrition and Dietetics, Tata McGraw Hill, Publications, New Delhi.

For FNTGCORO4T:

1. Anderson, L., Dibble, M.V., tukki, P.R., Mitchall, H.S., and Rynbergin H.J.: Nutrition in Health and Disease, 17th edition, J. B. Lipincott& Co. Philadelphia.

2. Anita F. P.: Clinical Dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.

3. Mahan, L. K., Arlin, M. T.: Krause's Food, Nutrition and Diet Therapy. 8th edition, W. B. Saunders Company, London.

4. Williams. S. R.: Nutrition & Diet Therapy, 6th edition, Times Mirror/Mosby College Publishings, St. Louis.

5. Raheena, Begum: A textbook of food, nutrition and dietetics Sterling Publishers, New Delhi.

6. Joshi, S. A. : Nutrition and Dietetics, Tata McGraw Hill, Publications, New Delhi.

Prasanta Chandra MahalanobisMahavidyalaya

Lesson Plan- 2019-2020

PARTIII Honors. &Programme Course

Name of the Department: _Food and Nutrition _____

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
February-June	**Hons**	**Paper V: Unit I** **NUTRITIONAL BIOCHEMISTRY**	2.**CARBOHYDRATES;** Glycolysis.Citric acid cycle, electron transport chain (brief idea), glycogenolysis, gluconeogenesis, HMP Shunt. **3.PROTEIN** Tertiary &Quarternary structures of protein with Haemoglobin& Collagen as examples, Deamination& Transamination, amino acid metabolism. **6. VITAMINS;** Structure & Biochemical roles, Deficiency disorders of Vitamin A, D, E, K, B1, B2, B6, Folic acid, Pantothenic acid, Niacin & Vitamin C. **7. MINERALS:** Biochemical functions of Na, K, Ca, P, I, Fe,Se-Disordersrelated to	Audio recorded Lecture,power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh;	Assignment/ class tests	4hrs 12hrs	Dr. Priyadarshini Chakraborty Dr. Priyadarshini Chakraborty JuthiSaha

			Hyperactivity & Deficiencies of those elements. **8. CELLULAR TRANSPORT:** Preliminary idea about membrane permeability, Active & Passive transport, Facilitated transport, a brief idea about gated channels & membrane –bound transport protein.			4 hrs 4hrs	Dr. Priyadarshini Chakraborty
		Paper V **Unit II: Microbiology**	**5.Morphology of Bacteria-** Slime layer, capsule, cell wall, flagella, pilli, fimbriae, cell membrane, ribosome, cytoplasmic inclusions (inorganic), endospore(structure, formation and germination. 6. Control of microbes- Sterilization, Disinfection, Antiseptics, detergents, methods of sterilization- Pysical (heat, low temp, radiation, filtration), Chemical (alcohol, phenol, halogen, heavy metals, formaldehyde). 7. **Food Microbiology-** milk as a growth medium of bacteria, normal	ICT,Lecture method; power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh; video demonstrations	Assignment/ class tests	4hrs 4hrs	Dr. Priyadarshini Chakraborty

			microflora in milk, undesirable microbes in milk, Pasteurization, phosphatase test, Methylene blue reduction test. Normal microflora of vehgetables& fruits, meat, fish, egg, canned food, cereal & cereal products, enumeration of microbespresent in food& milk. Outline of methods for detection of microorganisms in drinking ater (presumptive, confirmatory and completed test), distinction between faecal and non faecal coliforms- IMVic test. Extrinsic & intrinsic parameters affecting growth & survival of microbes. **8. Food borne diseases-** Food borne infection & intoxication. Different food borne diseases like Shigellosis, salmonellosis, Clostridium Perfringens food poisoning, Typhoid, E.Coli food poisoning, Bacillus cereus food poisoning- causative agent, symptoms, pathogenicity & preservation			4hrs 8hrs	
		Paper VI (Unit I: DIET THERAPY	6. Diseases of liver- General introduction , Symptoms of liver diseases, Reasons of liver	Audio recording Lecture method,	Assignment/ class tests/practical	10hrs	JuthiSaha

			diseases, Basic idea of liver function tests, Causes , clinical features , treatment & dietary management of – Infective hepatitis & jaundice, Cirrhosis of liver, Hepatic coma, Infantile biliary cirrhosis. 7. GALL STONE DISEASE- General Introduction, Type of Stones, Dietary management. 8. PEPTIC ULCER- General introduction of peptic ulcer disease. Causes of peptic ulcer disease, Mechanism of ulcer formation, symptoms of peptic ulcer disease, treatment & dietary management. 9. INTESTINAL DISORDERS- General introduction and dietary management of different intestinal disorders. Constipation- causes, complication, type(in brief), dietary management. Flatulence- causes, treatment, dietary management. Diarrhoea- causes, physiological isturbances in the body during Diarrhoea. Different types of Diarrhoea, Symptoms, Complication, Prevention& treatment. ORS. Steatorrhoea- causes, treatment, dietary management. Ulcerative colitis- causes , symptoms, treatment& dietary management. Irritable bowel syndrome- causes , symptoms, dietary	Google meet virtual class, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh, e-book	demonstration/notebooks	8hrs 8hrs	

			management.				
		Paper VI Unit – II: DIET THERAPY	3.Diabetes Mellitus- General introduction & Classification. Factors responsible for diabetes. Role of hormones, Characteristics of Type I & Type II diabetes. Treatment & dietary management of diabetes, Complications associated with it. 4. FOOD ALLERGY; Introduction & definition related to food allergy, Predisposing factors of food allergy. Reasons for allergy. Classification of allergy. Allergic reaction (elementary idea), Symptoms of allergy, Role of food as allergen, Treatment & dietary management of food allergy, with elimination diet	Audio recording Lecture method, Google meet virtual class, power point presentation and e-resources	Assignment	15hrs	Dr. Priyadarshini Chakraborty

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		PAPER VII UNIT I: BIOCHEMISTRY PRACTICAL	GROUP A- QUALITATIVE ESTIMATION- 3. Qualitative estimation of fat. Solubility test, Unsaturation test, Saponifacation test, Test with soap &acrolin layer. 4. Chromatographic separaration of Amino acids from mixture of amino acids & determination of Rf value. GROUP B- QUANTITATIVE ESTIMATION: 6. Quantitative estimation of serum acid phosphatase 7. Quantitative estimation of serum alkaline phosphatase. 8. Quantitative estimation of Vitamin C in lemon juice. 9. Quantitative estimation of glucose using fehling solution 10. Determination o facid value of fat.	Audio recorded Lecture, power point presentation and Video demonstrations of practical.		10 hrs 10 hrs	Dr. Priyadarshini Chakraborty Dr. Priyadarshini Chakraborty

		PAPER VII- UNIT II- (FOOD PRESERVATION AND PREPARATION) PRACTICAL	3. Use of sun drying for preservation of food. 4. Preparation of fermented food product 5. Visit- Milk industry visit Food testing lab visit .	Audio recorded Lecture, power point presentation and Video demonstrations of practical. Virtual Lab visit conducted	Class assignments	12hrs	Dr. Priyadarshini Chakraborty
		PAPER VIII, UNIT-I: DIET THERAPY PRACTICAL	5.Planning and preparation of diets for the following condition- Jaundice, peptic ulcer, diabetes, Fever, CHD, Gout, Renal failure (acute	Online demonstration of practical	Assignment/ project report/ Notebooks	10hrs	JuthiSaha

			or chronic), Obesity.				
		PAPER VIII- UNIT II- MICROBIOLOGY	3. Inoculation of one gram positive and one gram negative bacteria 4.Gram staining	Online demonstration of practical	Assignment	6 hrs	Dr. Priyadarshini Chakraborty
		PAPER VIII- UNIT III- (PROJECT AND SEMINAR)	1. Review and Project work 2.Seminar presentation models related to health and nutrition education.	Preparation of chart/ poster preparation, and dissertation	Assignment	8 hrs	Dr. Priyadarshini Chakraborty Dr.GuddiTiwary

	Programme course	**PAPER IV- UNIT-I (GROUP-A; COMMUNITY NUTRITION)**	3. Role of National & International organizations in improving community health- Who, FAO, UNICEF, CARE, NIN, CFTRI, ICMR. 5.Current National Nutrition Intervention Programmes in India- SNP, ANP, ICDS, Mi day meal, NIDDCP, NPPMB,NNAPP.	Audio recorded Lecture, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh;	Assignment	15 hrs	JuthiSaha
		PAPER IV- UNIT-I (GROUP B- FOOD MICROBIOLOGY &SANITATION)	3. Food borne infections and infestations. Causative organisms, Symptoms, Mode of transmission, method of preservation. 5. Food adulteration- Definition, types, Introduction to food standards and food laws- PFA Act, AGMARK, PFO, MPO, Codex Allimeterious, Consumer Protection Act, HACCP				Dr. Priyadarshini Chakraborty

		PAPER IV-UNIT-II (PRACTICAL)	2.Pllotting of growth chart 3.Identification of unknown microbes (prepared slides)	Online demonstration of practical	Assignment	10hrs	Dr. GuddiTiwary

Recommended Text books:

For FNTACOR13T:

1.Subalakshmi, G and Udipi (2001), S.A. Food processing and preservation; New Age International Publishers, New Delhi.

2. Srilakshmi, B. (2003), Food Science. New Age International Publishers, New Delhi.

3. Potter, N.N. and Hotchkiss J. H. (1996), Food Science. CBS publishers and distributors.

4. Srivastava, R.P.O. and Kumar, S. (1994) Fruit and vegetable preservation, International Book distribution Company, Lucknow.

5. MC Williams, M and Paine, H. (1994), Modern Food preservation.Surjeet Publications, Delhi.

6. Cruess, W.V.(1997), Commercial Fruits and Vegetable Products, Anees Offset press, New Delhi.

For FNTACOR14T:

1. Kothari C R(2004) Research Methodology, Methods &Techniques, 2nd Edi. New Age International Publishers.
2. Mahanjan BK (2010) Methods in Biostatistics, 7th Edi, Jaypee Brothers Medical Publishers (P) LTD.
3. Gun AM, Gupta MK,DasGupta b. (2008). Fundamentals of Statistics, 8th Edi, World press.
4. Malhotra OP, Gupta SK (1990) Elementary Statistics , 5thedi., S chand and Company.

For FNTADSE04T:

1. West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition Revised ByHargar FV, Shuggart SG, &Palgne Palacio June, Macmillan Publishing Company New York.

2. SethiMohini (2005) Institution Food Management New Age International Publishers

3. Knight J B &Kotschevar LH (2000) Quantity Food Production Planning & Management 3rd edition John Wiley & Sons

4. Philip E Thangam (2008) Modern Cookery for teaching and Trade Part I & II Orient Longmam

5. Taneja S and Gupta SL (2001) Enterpreneurship development, Galgotia Publishing

For FNTADSE05T:

1. Webb and Johnson (1988), Fundamentals of Dairy Chemistry, 3rd ed., CBS Publishers, New Delhi.

2. Pieter Walstra Jan T. M. Wouters Tom J. Geurts (2006), Dairy Science and Technology, Second Edition, CRC Press, Tayor and Francis group.
3. M.P.Mathur, D.D.Roy&P.Dinakar (2008), Textbook of Dairy Chemistry, Published by ICAR.

For FNTGDSE03T:

1. Manay NS, Shadaksharaswamy M. (2008) Foods facts and Principles, 3rdedi., New Age International (p) limited , publishers.

Recommended Text books:

For PAPER V & VII:

1. Lehninger, A.L.; Nelson, D. L. and Cox, M. M. Principles of Biochemistry. CBS Publishers and Distributors.
2. A.C Deb, (2001) Fundamental of Biochemistry, New Central Book Agency (p) Ltd; 9th edition.
3. Debajyoti Das, Biochemistry, 14th Ed, Academic publishers.
4. Frazier, W. C. and Westhoff, D. C. (1988): 4th edition, Food Microbiology, MaGraw Hill Inc.
5. Jay James. N. (1986) : 3rd edition, modern Food Microbiology, Van Nestrand Reinhold Company Inc.
6. Pelczar, M.I. and Reid, K. D. (1978): Microbiology, McGraw Hill Company, New York.
7. Benson Harold, J. (1990) : Microbiological Application, Publishers, U.S.A.
8. Colling, C.E. and Lyne, P.M. (1976) : Microbiological Methods Butterworth. London
9. Jay JM, Modern Food Microbiology, CBS Publication New Delhi 3rd Ed. 1987

For PAPER VI :

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1. Anderson, L., Dibble, M.V., tukki, P.R., Mitchall, H.S., and Rynbergin H.J.: Nutrition in Health and Disease, 17th edition, J. B. Lipincott& Co. Philadelphia.
2. Antia F. P.: Clinical Dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.
3. Mahan, L. K., Arlin, M. T.: Krause's Food, Nutrition and Diet Therapy. 8th edition, W. B. Saunders Company, London.

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Lesson Plan- 2019-20

Semester I Honors. &Programme Course

Name of the Department: COMPUTER SCIENCE

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
September-November	**Programme Course**	**CMSGCOR01T** **CMSGCOR01P**	Computer Fundamentals Planning the Computer Program Techniques of problem Solving Overview of Programming Introduction to Python	classroom	class test Internal	30 30	SD SS
December-january	**Programme Course**	**CMSGCOR01T** **CMSGCOR01P**	Creating Python Programs Structures Introduction to Advanced Python	classroom	class test Internal	30 30	SD SS

Recommended Text books:

1. T. Budd, Exploring Python, TM H, 1st Ed, 2011

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Lesson Plan- 2019-20

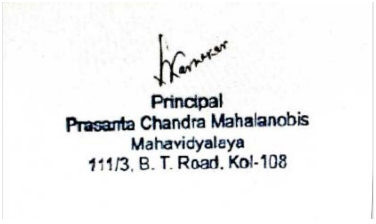
Semester III Programme Course

Name of the Department: COMPUTER SCIENCE

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
August-September	**Programme Course**	CMSGCOR03T CMSGCOR03P	Operating System introduction Types of operating systems Operating System Organization Process Management	classroom	class test Internal	30	SD SS
November-january	**Programme Course**	CMSGCOR03T CMSGCOR03P	Scheduling Memory Management		class test Internal	30	SD SS

Recommended Text books:

1. A Silberschartz, P. B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications 2008



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Lesson Plan- 2019-20

PART III Programme Course

Name of the Department: COMPUTER SCIENCE

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
August – January	**Programme Course**	CMSG **Paper IV Group A : Communication and Computer Networks**	***Communication Concepts :*** Analog and Digital communication strength, bandwidth, data rate, channel capacity. S/N ratio, modulation and demodulation FSK, ASK. **Transmission media:**Guided (twisted pair, co-axial, optical fiber) and unguided (microwave, satellite) ***Audio and Video communication systems :*** Analog and digital telephone, AM & FM radio, cable TV network, ISDN, paging, cordless and cellular phones, ATM.	Chalk and Board method, Lecture method and texts and reference books	class test	30	SD
February-June	**Programme Course**	CMSG **Paper IV**	**Computer Networks** *: LAN*, MAN, WAN *Architecture* – OSI, TCP/IP	Chalk and Board method, Lecture method and texts and	class test	30	SD

		Practical **Group B1 : Shell Programming**	and http protocol **LAN :** Ethernet and Token Ring topology High speed LANs Internetworking Modems, bridges and routers, connectivity concepts. Network **security.** **The Internet :** basic idea, DNS and URL, IP address, browsers **E-mail** *Files & Directories :* Copy, delete, rename, compare files, create, navigate, remove directories, access vi editor, status of users, background jobs; Pipes & filters; cutting, pastings and sorting of files, pattern searching in a string. ***Shell Programming :*** Concept and simple programming problems	reference books Hands on Practical Demonstration	Assignment	40	SD

Recommended Text books:

1. Data Communications and Networking by Behrour A. Forouzan, 4th Edition, TMH

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Semester II General Course

Name of the Department: Computer Science

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
March-April	**Programme Course**	**CMSGCOR02T** **CMSGCOR02P**	1. Introduction to DBMS 2. ERD	Chalk and Board method, Lecture method and texts and reference books Hands on Practical	class test Internal Assignment	30 20	SD SS
May-June	**Programme Course**	**CMSGCOR02T** **CMSGCOR02P**	3. Relational Data Model 4. Database design	Chalk and Board method, Lecture method and texts and reference books Hands on Practical	class test Internal	30	SD SS

Recommended Text books:

1. **. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems 6th Edition, Pearson Education, 2010.**

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Semester IV Programme Course

Name of the Department: Computer Science

Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
February-April	**Programme Course**	**CMSGCOR04T**	Introduction, Data Representation and basic Computer Arithmetic, Basic Computer Organization and Design, Central Processing unit	Chalk and Board method, Lecture method and texts and reference books	Class Test	30	SD DC
May-June	**Programme Course**	**CMSGCOR04T**	Programming the Basic Computer, Input-output Organization	Chalk and Board method, Lecture method and texts and reference books	Class Test	30	SD DC
		CMSGCOR04P	Programming	Hands on Practical	Assignment	30	SS

Recommended Text books:

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems 6th Edition, Pearson Education, 2010.

2. **R. Mall, Fundamentals of software Engineering(2nd edition), Prentice –Hall of India, 2004**

3. **Morris Mano, Computer System Architecture, Pearson Education 1992**