Prasanta Chandra Mahalanobis Mahavidyalaya

Lesson Plan- 2020-21

Semester II Honours. & Programme Course

Name of the Department: GEOGRAPHY

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
January-March	**Hons.**	**Human Geography. - GEOACOR03T**	1. Nature, scope and recent trends. Elements of Human Geography 2. Approaches to Human Geography; Resource, Locational, Landscape, Environmental. 3. Concept and classification of race; ethnicity 4. Space, society and cultural regions (language and religion) 5. Evolution of human societies: Hunting and food gathering, pastoral nomadism, subsistence	PPT and ICT mode of Teaching	Continuous evaluation & class Test	45 Hours	SR, SC, AR &RB
		Cartograms and Thematic mappingGEOACOR04T	1. Concepts of rounding, scientific notation, logarithm and anti-logarithm, natural and log scales 2. Diagrammatic representation of data: Line, Bar, Isopleths 3. Representation of area data: Dots and spheres, proportional circles and Choropleth	Black board teaching & hands On Practice	Continuous Evaluation & Class test	30 hours	SC,RB,SR
		Cartograms and Thematic MappingGEOACOR04P	1.Thematic maps:– Choropleth showing density of population 2.– Dots and Spheres diagram showing distribution of rural and urban population.	PPT Presentation and ICT mode of teaching	Class tests- & Internal Evaluation	30hours	SC,SR& RB

			3.– Proportional pie-diagrams representing economic data and land use data				
April-June	**Hons.**	**Human Geography** **GEOACOR03T**	6.Human adaptation to environment: Eskimo, Masai and Maori 7. Population growth and distribution, composition; demographic transition 8. Population–Resource regions (Ackerman) 9. Types and patterns of rural settlements 10. Morphology of urban settlements	PPT and Black Board Teaching	Internal Examination and / Class Test	45 hours	SC, AR,RB AND SR
		Cartograms and Thematic MappingGEOACOR04T	4.Preparation and interpretation of land use land cover maps 5. Preparation and interpretation of socio-economic maps 6. Bearing: Magnetic and true, whole-circle and reduced 7. Basic concepts of surveying and survey equipment: Prismatic Compass, Dumpy Level, Theodolite	Hands on Practice & Field Visit in Geological survey of India, Kolkata	Continuous Evaluation & Class test	30 hours	RB & SC
		Cartograms and Thematic mapping GEOACOR04P	4.Traverse survey using prismatic compass , Profile survey using dumpy Level	PPT Presentation	Class Test	30 Hours	RB,SC
		Total				210 Hours	

Recommended Text Book:

Mandal, R.B. 2001. Introduction to Rural Settlement, 2nd ed, Concept Publishing Company.

Gregory, D., Johnston, R., Pratt, G., Watts.,Whatmore, S. (Eds) 2009. The Dictionary of Human Geography, 5th ed, Wiley.

Monkhouse, F.J., Wilkinson, H.R. 1971. Maps and Diagrams: Their Compilation and Construction, 3rd ed (2017 reprint),Alphaneumera-Kolkata.

Sarkar, A. 2015. Practical Geography: A Systematic Approach, 3rd ed, Orient Blackswan Private Ltd.

Singh, R.L., Singh, R.P.B. 2008.Elements of Practical Geography, Kalyani Publishers.

Prasanta Chandra Mahalanobis Mahavidyalaya

Lesson Plan- 2020-21

Semester IV Honors. & Programme Course

Name of the Department: __GEOGRAPHY

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
January-March	**Hons.**	**Regional planning and development GEOACOR 08T**	1.Concept of regions: Types of regions and their delineation 2. Regional Planning: Types, principles, objectives, tools and techniques 3. Need for regional planning in India, multi- level planning in India 4. Metropolitan concept and urban agglomerations 5. Concepts of growth and development, growth versus development	PPT and ICT mode of Teaching	Continuous evaluation & class Test	40 Hours	SR, SC, AR &RB
		Economic Geography GEOACOR 09T	1.Meaning and approaches to Economic Geography. 2.Concepts in Economic Geography :Goods and services ,production ,exchange and consumption 3. Concept of economic man, theories of choices 4. Economic distance and transport costs 5. Concept and classification of economic activities 6. Factors affecting location of economic activity with special reference to agriculture (Von Thünen), and industry(Weber). 7. Primary activities: Agriculture, forestry, fishing and mining 8. Secondary activities: Manufacturing (cotton textile, iron and steel), concept of manufacturing	Black board teaching & hands On Practice	Continuous Evaluation & Class test	45 hours	SC & RB
		Environmental Geography	Geographers‘ approach to environmental studies	PPT Presentation and	Class tests- & Internal Evaluation	30 hours	AR & RB

		GEOACOR 010T	2. Concept of holistic environment and systems approach 3. Ecosystem: Concept, structure and functions 4. Space–time hierarchy of Environmental problems: Local, regional and global	ICT mode of teaching			
		Environmental Geography GEOACOR 10P	Preparation of questionnaire for perception survey on environmental problems 2. Preparation of check-list for Environmental Impact Assessment of an urban/industrial project 3. Interpretation of air quality using CPCB / WBPCB data	Black Board Teaching & Hands-on Practice	Continuous Evaluation & Class test	30 Hours	AR, SR
April-June	**Hons.**	**Regional planning and Development GEOACOR 08T**	6. Indicators of development: Economic, social and environmental 7. Human development: Concept and measurement 8. Theories and models for regional development: Cumulative causation (Myrdal) 9. Theories and models for regional development: Stages of development (Rostow), growth pole model (Perroux). 10. Concept and causes of underdevelopment 11. Regional development in India: Disparity and diversity 12. Need and measures for balanced development in India	PPT and Black Board Teaching	Internal Examination and / Class Test	50 hours	SC, AR , RB SR
		Economic Geography GEOACOR 9T	9. Tertiary activities: Transport, trade and services 10. Agricultural systems: Case studies of tea plantation in India and mixed farming in Europe 11. Transnational sea-routes, railways and highways with reference to India 12.International trade and economic blocs: WTO, GATT and BRICS: Evolution ,structure and functions	Hands on Practice & Field Visit in Geological survey of India, Kolkata	Continuous Evaluation & Class test	45 hours	RB & SC
		Environmental Geography GEOACOR 10T	Environmental pollution and degradation: Land, water and air 6. Urban environmental issues with special reference to waste management	PPT Presentation	Class Test	30 Hours	AR, RB,SR

			7. Environmentalpolicies– NationalEnvironmentalPolicy,2006,EarthSummits(Stockholm,Rio, Johannesburg) 8. Global initiatives for environmental management (special reference to Montreal Protocol, Kyoto Protocol, Paris Climate Summit)				
		Environmental Geography GEOACOR 010P	1.Preparation of questionnaire for perception survey on environmental problems 2. Preparation of check-list for Environmental Impact Assessment of an urban/industrial project 3. Interpretation of air quality using CPCB / WBPCB data	Hand-on Practice	Continuous Evaluation & Class test	30 hours	AR, RB & SR
		Total				300 hours	

Recommended Text books:

- Chand, M., Puri, V.K. 2000. Regional Planning In India, Allied Publishers Ltd. Chandana,
- R.C. 2016. Regional Planning and Development, 6th ed, Kalyani Publishers.
- Misra, R.P. 1992. Regional Planning: Concepts, Techniques , Policies and Case Studies, Concept Publishing.
- Ray, J. 2001. Introduction to Development & Regional Planning, Orient Blackswan
- Wheeler, J.O., Muller, P.O., Thrall, G.I., Fik, T.J. 1998. Economic Geography, 3rd ed, Wiley.
- Willington D. E., 2008: Economic Geography, Husband Press. Wood, A., Roberts, A. 2010.
- Economic Geography: Places, Networks and Flows, Routledge.
- Basu, R. and Bhaduri, S. (Eds) 2007. Contemporary Issues and Techniques in Geography, Progressive Publishers.
- Chandna, R.C. 2002. Environmental Geography, Kalyani Press.
- Chapman, J.L., Reiz, M.J. 1993. Ecology: Principle and Applications, Cambridge University Press.
- Miller, G.T. 2004. Environmental Science: Working with the Earth, Thomson Brooks.

Prasanta Chandra Mahalanobis Mahavidyalaya

Lesson Plan- 2020-21

Semester IV Programme Course

Name of the Department: __GEOGRAPHY

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
January to March	**Programme Course**	**Environmental Geography, GEOGCOR04T**	Environmental Geography: Concepts and Approaches 10. Human-Environment Relationship in equatorial, desert, mountain and coastal regions 11. Concept of holistic environment and system approach 12. Ecosystem: Concept, structure and functions 13. Environmental Problems and Management: Air Pollution; Water pollution Biodiversity Loss; Solid and liquid waste.	PPT and ICT mode of Teaching	Continuous evaluation & class Test	30 Hours	SR, SC, AR,RB
April to June	**Programme Course**	**Environmental Geography, GEOGCOR04T**	Environmental problems and management: Desertification and soil erosion 7. Environmental Programmes and Policies: Developed Countries; Developing Countries. 8. New Environmental Policy of India.	PPT and ICT mode of Teaching	Continuous evaluation & class Test		AR,SC,SR,RB
		Total					

Recommended Text Book:

1. Singh, R.B. (1993) Environmental Geography, Heritage Publishers, New Delhi.
2. UNEP (2007) Global Environment Outlook: GEO4: Environment For Development, United Nations EnvironmentProgramme. University Press, Cambridge.
3. Wright R. T. and Boorse, D. F. (2010) Toward a Sustainable Future, PHI Learning Pvt Ltd, New Delhi.

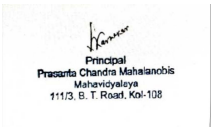
Singh, R.B. and Hietala, R. (Eds.) (2014) Livelihood security in Northwestern Himalaya:

Semester IV Honours and Programme Course

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-May	**General**	**GEOSSEC02M** – Advanced Spatial Statistical Techniques	1. Probability theory, probability density functions with respect to Normal, Binomial and Poisson distributions and their geographical applications. 3. Correlation and Regression Analysis: Rank order correlation and product moment correlation; linear regression, residuals from regression, and simple curvilinear regression. Introduction to multi-variate analysis.	ICT mode of Teaching and Hands on Practice	Project Submission	15	RB, SR
June – August	**General**	**GEOSSEC02M** – Advanced Spatial Statistical Techniques	2. Sampling: Sampling plans for spatial and non-spatial data, sampling distributions. Sampling estimates for large and small samples tests involving means and proportions. 4. Time Series Analysis: Time Series processes; Smoothing time series; Time series components.	ICT mode of Teaching and Hands on Practice	Project Submission	15	RB, SR
		Total				30 Hours	

Recommended Text books:

- Acevedo, M.F. 2012. Data Analysis and Statistics for Geography, Environmental Science and Engineering, CRC Press.
- Harris, R., Jarvis, C. 2011. Statistics for Geography and Environmental Science, Prentice Hall.
- McGrew Jr., J.C., Lembo Jr., A.J.,Monroe, C.B. 2014. An Introduction to Statistical Problem Solving in Geography, 3rd ed, Waveland Press.
- Pal S. K., 1998. Statistics for Geoscientists: Techniques and Applications, Concept Pub Co.



Prasanta Chandra Mahalanobis Mahavidyalaya

Lesson Plan- 2020-21

Semester VI Honors. & Programme Course

Name of the Department: GEOGRAPHY

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
January-March	**Hons.**	**Evolution of Geographical ThoughtGEOACOR 13T**	1. Development of Geography: Contributions of Greek and Chinese geographers 2. Impact of _Dark Age' in Geography and Arab contributions 3. Geography during the age of _Discovery' and _Exploration' (contributions of Columbus, Vasco da Gama, Magellan, Thomas Cook) 4. Transition from cosmography to scientific Geography (contributions of Bernard Varenius and Immanuel Kant). Dualism and Dichotomies (Ideographic vs. Nomothetic, Physical vs. Human, Regional vs. Systematic, Determinism vs. Possibilism,)	PPT and ICT mode of Teaching	Continuous evaluation & class Test	45 Hours	SR, SC, AR
		Disaster Management GEOACOR14T	1. Classification of hazards and disasters. 2. Approaches to hazard study: Risk perception and vulnerability assessment. Hazard paradigms. 3. Responses to hazards: Preparedness, trauma and aftermath. Resilience and capacity building. 4. Hazards mapping: Data and geospatial techniques (for hazards enlisted in Unit II and Core 14P)	PPT and ICT mode of teaching.	Continuous Evaluation & Class test	30 hours	SC & RB
		Disaster Management GEOACOR14P	An individual Project Report is to be prepared and submitted based on any one case study among the following disasters of West	PPT Presentation and ICT mode of teaching	Class tests- & Internal Evaluation	60 hours	AR , RB,SC,SR

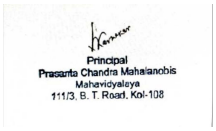
			Bengal incorporating a preparedness plan 1. Thunderstorm 2. Landslide 3. Flood 4. Coastal / riverbank erosion 5. Fire 6. Industrial accident 7. Structural collapse One case study will be done by a group of five students.				
		Hydrology and Oceanography GEOADSE04T	1. Systems approach in hydrology. Global hydrological cycle: Its physical and biological role 2. Run off: controlling factors. Infiltration and evapotranspiration. Run off cycle 3. Drainage basin as a hydrological unit. Principles of water harvesting and watershed management 4. Groundwater: Occurrence and storage. Factors controlling recharge, discharge and movement	PPT Presentation and ICT mode of teaching	& Class test Continuous Evaluation	45 Hours	AR, SR,RB
		Resource Geography GEOADSE06T	1. Natural Resources: Concept and classification 2. Approaches to Resource Utilization: Utilitarian, Conservational, Community based adaptation 3. Significance of Resources: Backbone of Economic growth and development 4. Pressure on resources. Appraisal and Conservation of Natural Resources 5. Problems of resource depletion—global scenario (forest, water, fossil fuels). 6. Sustainable Resource Development 7. Distribution, Utilisation, Problems and Management of Mineral Resources: Bauxite and Iron Ore.	PPT Presentation and ICT mode of teaching	& Class test Continuous Evaluation	45Hours	SC,AR,SR
April-June	**Hons.**	**Evolution of Geographical ThoughtG**	5. Evolution of Geographical thoughts in Germany, France, Britain and United States of	PPT and Black Board Teaching	Internal Examination and / Class Test	45 hours	AR, SR,SC

		EOACOR 13T	America 6. Contributions of Humboldt and Ritter 7. Contributions of Richthofen, Hettner, Ratzel and Vidal de La Blaché 8. Trends of geography in the post-World War-II period: Quantitative Revolution, systems approach. 9. Evolution of Critical Geography: Behavioural, humanistic and radical. 10. Changing concept of time-space in geography in the 21st Century.				
		Disaster Management GEOACOR14T	5. Earthquake: Factors, vulnerability, consequences and management 6. Landslide: Factors, vulnerability, consequences and management 7. Tropical Cyclone: Factors, vulnerability, consequences and management 8. Riverbank erosion: Factors, vulnerability, consequences and management 9. Radioactive fallout: Factors, vulnerability, consequences and management.	Hands on Practice & Field Visit in Geological survey of India, Kolkata	Continuous Evaluation & Class test	30 hours	RB & SC
		Hydrology and Oceanography GEOADSE04T	5. Major relief features of the ocean floor: characteristics and origin according to plate tectonics 6. Physical and chemical properties of ocean water 7. Water mass, T–S diagram 8. Ocean temperature and salinity: Distribution and determinants 9. Marine resources: Classification and sustainable utilisation 10. Sea level change: Types and causes .	PPT Presentation	Class Test	45 Hours	AR, RB

		Resource geography GEOADS E06T	8. Distribution, Utilisation, Problems and Management of Energy Resources: Conventional and Non- Conventional 9. Contemporary Energy Crisis and Future Scenario 10. Limits to Growth and Sustainable Use of Resources; Concept of Resource sharing: Water.	PPT Presentation	Continuous Evaluation & Class test	45 hours	AR, SC & SR
		Total				345 Hours	

Recommended books:

1. Husain, M. 2015. Evolution of Geographical Thought, 6th ed, Rawat Publications.
2. Dikshit, R.D. 2004. Geographical Thought: A Contextual History of Ideas, Prentice Hall India
3. Joseph, G. and Jegannathan, C. 2018. Fundamentals of Remote Sensing, 3rd ed, Universities Press.
4. Lillesand, T.M., Kiefer, R.W. and Chipman, J.W., 2015. Remote Sensing and Image Interpretation, 7th ed, Wiley
5. Sarkar, A. 2015. Practical Geography: A Systematic Approach. 2nd ed, Orient Black Swan Private Ltd.
6. Bhatta, B. 2011. Remote Sensing and GIS, 2nd ed, Oxford Univ. Press.
7. Sharma, R.C. and Vatal, M 2018. Oceanography for geographers, Surjeet Publication
8. Singh, S. 2018. Fundamentals of Hydrology, Pravalika Publications, Allahabad
9. Subramanya, K. 2013. Engineering Hydrology, McGraw Hill Education
10. Gregory, D., Johnston, R., Pratt, G., Watts.,Whatmore, S. (Eds) 2009. The Dictionary of Human Geography, 5th ed, Wiley



Prasanta Chandra MahalanobisMahavidyalaya

Lesson Plan- 2020-21

Semester I Honors. &Programme Course

Name of the Department: Food and Nutrition

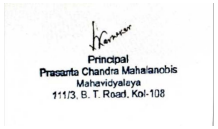
Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned
September - November	**Hons.**	**FNTACOR01T: HUMAN NUTRITION (THEORY)**	1**. Introduction to Food and Nutrition** Foods: Energy giving, 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.	Lecture method; Chalkboard, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh, e-book	Class Assignment	4 hrs	Juthi Saha

			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.			10 hrs	

		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	Offline hands on practical class	Assignments	10hrs 3hrs 12hrs	Dr. Tanima Paul Das
		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,	Lecture method; Chalkboard, PDF	Assignments	10hrs	Sahin Sultana

			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.			10hrs	
		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).	Offline hands on practical class	Assignments	5hrs 4hrs	Sahin Sultana

			3. Interpretation of normal ECG curve with 6 chest leads.			10hrs	



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	Lecture method; Chalkboard, PDF	Assignments	4 hrs 6 hrs 10 hrs	Dr. Tanima Paul Das Juthi Saha

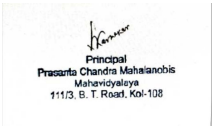
			cookery of cereals, pulses, milk & milk products, meat, fish, egg, vegetables & fruits, nuts, oil & sugar. **4. Food Chemistry** Chemistry of carbohydrate, proteins and fats. Vitamins and minerals			8 hrs	Dr. Tanima Paul Das
		FNTGCOR01P : FOOD AND	1. Elementary idea of weights &	Offline hands on practicals	Assignments	4hrs	Dr. Tanima Paul Das

		NUTRITION (PRACTICAL)	measures. 2. Preparation of cereals, pulses, vegetable, egg, milk, fish, nuts dishes. 3. Planning and preparation of diet of an adult male/female.			6hrs 6hrs	Juthi Saha
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,	Lecture method; Chalkboard, power point presentation and e-resources , e-books , text books, reference books, journals and notes	Class Assignment	15 hrs	Dr. Priyadarshini Chakraborty

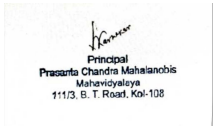
			Application of RDA, Reference man and woman.. **4. Digestion of Foods** Components of gastrointestinal tract. Structure of different segments of GI tract. Digestive glands: structure of salivary glands, gastric glands and intestinal glands. Structure of pancreas and liver., Digestive secretions: salivary 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 (Ca, Fe, I, F, Cu, Zn)	Lecture method; Chalkboard, power point presentation and e-resources , e-books , text books, reference books, journals and notes	Class Assignment	20 hrs	Dr. Tanima Paul(Das)

		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 for Grade I and Grade II malnourished child .	Offline hands on practical class	Assignments	12hrs 4hrs	**Juthi Saha**
		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	Lecture method; Chalkboard, PDF	Assignments	10hrs 10hrs	**Sahin Sultana**

			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 GFR and 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	

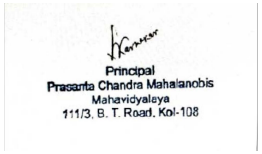


		FNTACOR02P: PHYSIOLOGY IN NUTRITION(PRACTICAL)	4. Measurement of Peak Expiratory flow rate.(By spirometer) 5. Determination of Bleeding Time (BT) and Clotting Time (CT). 6. Detection of Blood group (Slide method).	Offline hands on practical class	Assignments	6hrs 6hrs 6hrs	**Sahin Sultana**



	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). **7. Deficiency diseases** Deficiency diseases (Nutritional anaemia, PEM, IDD, VAD)- Aetiology, Prevalence, Clinical findings, Prevention & Treatment.	Lecture method; Chalkboard, PDF	Assignments	12 hrs 6hrs 7hrs	**JuthiSaha**

		FNTGCOR01P : FOOD AND NUTRITION (PRACTICAL)	4. Planning of a day's diet for pregnant & lactating mother. 5. Preparations of supplementary foods for infants.	Offline hands on 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

Prasanta Chandra MahalanobisMahavidyalaya

Lesson Plan- 2020-21

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 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.	Lecture method; Chalkboard, power point presentation and e-resources , e-books , text books, reference books, journals and notes	Class Assignment/ class tests	12hrs 10hrs 6hrs	**Dr. Tanima Paul (Das)**

			Decarboxylation. glucogenic and ketogenic amino acids. Outline of urea cycle. Inborn errors of Metabolism.				
		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).	Offline hands on practical class	Class assignment/class test/ submission of notebooks	10hrs 10hrs 6hrs	Dr. Tanima Paul Das
		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 woman, Elderly. **3.Nutrition during Pregnancy**	Lecture method; Chalkboard, pdf, ppt, ict class	Assignments	3hrs 6hrs 10hrs	Dr. Guddi Tiwary Dr. Guddi Tiwary Dr. Guddi Tiwary

			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.				
		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	Offline hands on 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	Lecture method; Chalkboard, power point presentation and e-resources , e-book, journals and texts. Demonstration of models	Assignment	4hrs 12hrs	Dr. Priyadarshini Chakraborty Dr. Priyadarshini Chakraborty

			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, 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	and videos			Dr.

			2.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	Priyadarshini Chakraborty
		FNTACOR07P: ELEMENTARY DIETETICS AND MENU PLANNING (PRACTICAL)	1. Planning and preparation of normal diets. 2. Planning and preparation of different fluid diets.	Offline hands on practical class	Assignment	10hrs 10hrs	Dr. Priyadarshini Chakraborty
	Hons and Programme course	**FNTSSEC01M: INSTRUMENTATION**	**1.Microscopy** Brightfield and darkfield microscopy, Optical Microscopy, Phase contrast Microscopy, Inverted Microscopy **2.Chromatography** 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	Powerpoint presentation, lecture method, Chalkboard, e-book referred	Assignment	4hrs 6hrs 6hrs	JuthiSaha Dr. Tanima Paul(Das) JuthiSaha

			biomolecules, Analysis of biomolecules using UV and visible range, Colorimetry. Protein concentration of spectrophotometer/ colorimeter ,				
	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. **2.Nutritional Assessment** Nutritional Assessment: Meaning, need, objectives and importance. Method of assessment of nutritional status – Anthropometry, Clinical, Biochemical, Dietary surveys, Vital health statistics	Lecture method; Chalkboard, power point presentation and e-resources , e-book, journals and texts. Demonstration of models and videos	Assignment	4hrs 15hrs	Dr. Tanima Paul Das
		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.	Offline practical class	Assignment/ Projects/field visits	10hrs 10hrs	Dr. Tanima Paul Das
November-January	**Hons**	**FNTACOR05T: NUTRIENTS METABOLISM(THEORY)**	**4.Biological oxidation** Mitochondrial electron transport chain. High energy phosphate bond. Formation of ATP.	Lecture method; Chalkboard, power point presentation and e-	Assignment/ class test	2hrs	Dr. Tanima Paul Das

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			5.Nucleic acid metabolism Chemical structure of purine 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.	resources , e-book, journals and texts. Demonstration of models and videos Powerpoint presentation, Lecture method, e-book referred, study material Powerpoint presentation, Lecture method, e-book referred, study material		5hrs 8hrs 8hrs	JuthiSaha **Dr. Tanima Paul (Das)** **JuthiSaha**
		FNTACOR05P: NUTRIENTS METABOLISM(PRACTICAL)	4. Estimation of iron in vegetables by spectrophotometry. 5. Estimation of DNA (PDA method) and RNA (Orcinol method) in tissues by spectrophotometry.	Offline hands on practical class	Class assignment/ class test/ submission of notebooks	10hrs 10hrs	**Dr. Tanima Paul (Das)**

		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 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**	Lecture method; Chalkboard,	Assignment	8hrs 12hrs 8hrs	**Dr. Guddi Tiwary** **Dr. Guddi Tiwary**

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			Growth and development in children, RDA, nutritional guidelines, nutritional concerns and healthy food choices for: Preschool children, School children, Adolescents				
		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 DIETETICS AND MENU PLANNING (THEORY)	**4.Menu Planning** 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**.**	Lecture method; Chalkboard, power point presentation and e-resources , e-book, journals and text books.	Assignment	8hrs 10hrs	**Dr. Priyadarshini Chakraborty** **Dr. Priyadarshini Chakraborty**

			6. Diet for health care Team approach to health care. Assessment of Patient's needs. **7. Routine Hospital Diet** Routine Hospital Diets: Regular, light, soft, fluid, parenteral and enteral feeding.			4hrs 5hrs	**Dr. Priyadarshini Chakraborty**
		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	Offline 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 ultracentrifugation Separation of components of a given mixture using a laboratory scale centrifuge **6. ECG and EEG**	Lecture method; Chalkboard, power point presentation and e-resources , e-book, journals and text books	Project work	3hrs 6hrs 1hr	**Dr. Priyadarshini Chakraborty** **Dr. Tanima Paul(Das)** **Dr.**

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			Principles of ECG and EEG, application of ECG and EEG **7. ELISA** Principle and applications of ELISA test			1hr	**Priyadarshini Chakraborty** **Dr. Tanima Paul(Das)**
	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 India- SNP, ANP, ICDS, Midday meal, NIDDCP, NPPNB, NNAPP. **5.Nutrition Education** Nutrition Education: Definition, objectives of nutrition education. Methods of imparting nutrition education.	Lecture method; Chalkboard, power point presentation and e-resources , e-book, journals and text books	Assignment/ class tests	12hrs 12hrs 8hrs	**Dr. Guddi Tiwary**

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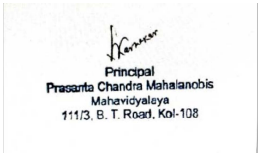
		FNTGCOR03P: COMMUNITY, NUTRITION AND HEALTH ASSESSMENT(PRACTICAL)	3. Diet survey by 24 hours recall method. 4. Preparation of homemade ORS. 5. Preparation of low cost and medium cost school tiffin.	Offline practical Class	Assignment	10hrs 2hrs 10hrs	**Dr. Guddi Tiwary**

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- 2020-21

Semester V 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**	**FNTACOR11T: CLINICAL NUTRITION AND DIET FOR SPECIAL SITUATIONS IN LIFE**	**1. Nutritional management of physiological stress** Nutrition in wound healing, Surgery: Pre and post surgical dietary management, Burns, Classification, Complication, Dietary management, Trauma: Dietary management, Sepsis: Dietary management**.** **2.Dietary Modification in febrile Condition** Acute, chronic and recurrent fevers, typhoid, rheumatic fever, tuberculosis, malaria, H1N1, dengue fever and chikun guinea. **3.Nutritional management of GI diseases**	Lecture method; Chalkboard, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh;	Assignment/ class tests	4hrs 4hrs 12hrs	JuthiSaha

			Diseases of Esophagus and stomach: Esophagitis(GERD), Dyspepsia, Peptic ulcer, Gastritis, Gastrectomy, Dumping syndrome . Intestinal diseases: Flatulence, Diarrhea, Constipation, Hemorrhoids, Diverticular disease,Duodenal ulcer, Inflammatory Diseases of Bowl: Crohn's disease and ulcerative colitis, IrritablebowlSyndrome, Colostomy,Ileostomy **4.Malabsorption syndrome** Celiac disease (Tropical sprue),Steatorrhoea, Intestinal Brush border diseases,Protein losing enteropathy			4hrs	
		FNTACOR11P: CLINICAL NUTRITION ANDDIET FOR SPECIAL SITUATIONS IN LIFE(PRACTICAL)	Planning and preparation of Diets for the following diseases: i) Peptic ulcer ii) Viral hepatitis	Offline hands on practical	Assignment	15hrs	JuthiSaha

		FNTACOR12T: FOOD MICROBIOLOGY AND IMMUNOLOGY (THEORY)	**1.General Introduction to microbes (Bacteria, Fungus, and Algae)** Classification, Nomenclature and Morphology (external and internal features). Principles of staining. **2.Growth kinetics of bacteria** Growth kinetics, Factors affecting growth, different nutritional mediafor growth, methods of media sterilization**.** **3. Microbiology of food** Microbes commonly present in food and the diseases caused by them, microflora present in milk, cereals, vegetables, flesh food. Seafood and Shell fish poisoning. Mycotoxins, Foodborne Diseases, Prions. **4.Microbial Food Spoilage** Sources of Microorganisms in foods, Some important food spoilage microorganisms,	ICT,Lecture method; Chalkboard, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh; video demonstrations	Assignment/ class tests	4hrs 4hrs 4hrs 8hrs	Dr. Tanima Paul(Das)

			Spoilage of specific food groups - Milk and dairy products, Meat, poultry and seafoods, Cereal and cereal products, Fruits and vegetables and Canned products.				
		FNTACOR12P: FOOD MICROBIOLOGY AND IMMUNOLOGY (PRACTICAL)	1. Introduction to microbiology: Use of equipments Understanding and use of compound microscope Use of Autoclave Use of Incubator and Inoculation chamber 2. Preparation of different types of media (complex, differential and selective) 3. Preparation of slant, stab and plates using nutrient agar 4. Morphological study of bacteria and fungi using permanent slides .	Hands on offline practical	Assignment/ class tests/practical demontration/notebooks	10hrs 8hrs 8hrs	Dr. Tanima Paul(Das)
		FNTADSE02T: ENTREPRENEURSHIP IN FOOD INDUSTRY (THEORY)	1.**Entrepreneurial Development** Case studies of successful entrepreneurs, Exercises on ways of sensing opportunities – sources of idea, creating efforts, SWOT 49 Analysis, Entrepreneurial skill assessment test, Techniques of development of	ICT, chalkboard, pdf ppt	Assignment	15hrs	Dr. Guddi Tiwary

			entrepreneurial skills, positive self image and locus of control. **2.Food Business management** Case studies of Food Processing Business and its aspects, Business opportunity Identification and Assessment techniques, Business Idea Generation and evaluation exercise, Market Assessment study Analysis of competitive situation			15hrs	
		FNTADSE02P: ENTREPRENEURSHIP IN FOOD INDUSTRY(PRACTICAL)	1. Preparation of business plan. 2. Preparation of project report.	Field visit, assessment	Assignment	10hrs 10hrs	Dr. Guddi Tiwary
		FNTADSE03T: FOOD BORNE DISEASES AND FOOD TOXICOLOGY(THEORY)	**1.Food borne diseases** Definition related to food borne diseases, types of diseases with example (Pandemic, Endemic and Epidemic). Infection, contamination, decontamination, disinfection, transmission (direct and indirect). Brief idea about different vector borne diseases, mode of transmission prevention and control of following diseases:	Lecture method; Chalkboard, power point presentation and e-resources , e-books , text books, reference books, journals and notes	Class assignments	12hrs	Dr. Priyadarshini Chakraborty

			Salmonella, Shigella, Typhoid, Botulism, Cholera, E. coli food poisoning, Staphylococcal food poisoning, Clostridium infection, Bacillary infection. **2.Lactose intolerance** Lactose intolerance-its mechanism and enzyme deficiency. **3.Mechanism of food borne diseases** Molecular mechanism of food borne diseases. **4.Food safety** Definition: Food safety, types of hazards (Biological, chemicaland physical hazards), impact on health, control measures, factors affecting food safety.	Lecture method; Chalkboard, power point presentation and e-resources , e-books , text books, reference books, journals and notes		2hrs 4hrs 8hrs	Dr. Priyadarshini Chakraborty Dr. Priyadarshini Chakraborty
		FNTADSE03P: FOOD BORNE DISEASES AND FOOD TOXICOLOGY(PRACTICAL)	1. Assessment of surface sanitation by swab and rinse method. 2. Assessment of personal hygiene. 3. Designing of various	Offline hands on practical and visit to Dairy Industry	Assignment/ project report/ Notebooks	5hrs 5hrs 5hrs	Dr. Priyadarshini Chakraborty

			food processing systems and food service areas. 4. Design and layout of cold storage and ware house.			5hrs	
	Programme Course	**FNTGDSE01T-PUBLIC HEALTH NUTRITION (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.**Public health** Definition of public health, relation between health and nutrition. **3.Maternal and Child health** Maternal and Child mortality: Definitions and causes, Role of health workers in the improvement of maternal and child health. **4.Immunization** Immunization: Importance and Immunization schedule	Chalkboard, pdf ptt	Assignment	6hrs 4hrs 8hrs 10hrs	Dr. Guddi Tiwary

			for children and adults.Hazards of immunization				
		FNTGDSE01P-PUBLIC HEALTH NUTRITION (PRACTICAL)	1. Growth charts - plotting of growth charts for growth monitoring. 2. Formulation and demonstration of nutrition education tools such as charts, posters, models related to health and nutrition education.	Field visit, chart/ poster preparation, handson practical work	Assignment	15hrs 15hrs	Dr. Guddi Tiwary
November-January	**Hons**	**FNTACOR11T: CLINICAL NUTRITION AND DIET FOR SPECIAL SITUATIONS IN LIFE (THEORY)**	**5.Diseases of Gall bladder and pancreas** Pathophysiologic changes, etiology and dietary management - (Biliary dyskinesia , Cholelithiasis, Cholecystitis, Cholecystectomy ,Pancreatitis **)** **6. Liver diseases** Pathophysiology, Progression of liver disease, Role of specific nutrients and alcohol in liver diseases. Nutritional care in liver disease in the context of results of specific liver function tests, Viral hepatitis , cirrhosis of Liver, Hepatic encephalopathy, Wilsons disease.	Lecture method; Chalkboard, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh;	Assigment	6hrs 5hrs	JuthiSaha

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			7. Nutrition Management of Renal Disease Etiology and pathogenesis, Clinical and metabolic manifestations Diagnostic tests, Acute and chronic nephritis, Nephrotic syndrome, Renal Failure: Acute and chronic, Nnephroletheasis,ESRD **8. Nutritional management in Allergy** Definition, symptoms mechanism of food allergy, Biochemical and immune testing (short), Elimination diets, Food selection, Food allergy in infancy: Milk sensitive enteropathy, intolerance to breast milk, Prevention of food allergy. **9.Neurological diseases** Alzheimer's, Parkinson's disease and Epilepsy, Anorexia nervosa and bulimia.			6hrs 4hrs 2hrs	
		FNTACOR11P: CLINICAL NUTRITION ANDDIET FOR SPECIAL	Planning and preparation of Diets for the following diseases: iii) Fever iv) Acute and chronic renal failure	Offline hands on practical	Assignment	15hrs	JuthiSaha

		SITUATIONS IN LIFE(PRACTICAL)					
		FNTACOR12T: FOOD MICROBIOLOGY AND IMMUNOLOGY (THEORY)	**5.Food Fermentations** Fermentation –definition and types, Microorganisms used in food fermentations, Dairy Fermentationsstarter cultures and their types , concept of probiotics, Fermentated Foods-types, methods of manufacture for vinegar, sauerkraut, tempeh, miso , soya sauce, beer, wine and traditional Indian foods. **6. Immune system** Cells & Organs of the immune system, Innate and Acquired, Primary and secondary immune response, Active and Passive, Antigen, Antibody, Haptens, Adjuvants, Immunoglobulin-classification, polyclonal and monoclonal, basic structure and function, antigenand antibody reactions- RIA, ELISA, Immunoblot. Antibody production -processing and presentation of	Lecture method; Chalkboard, power point presentation and e-resources , e-books , text books, reference books, journals and notes	Assignment/ class tests	10hrs 20hrs	**Dr. Tanima Paul(Das)**

			antigen, MHC, Humoral immune response. Cell mediated immunity, Formation, maturation and activation of B and T cells, Immune effectors system- cytokines complement system, K cells and NK cells, Cell mediated effectors response, Interferons, Immunopathology - basic principles of auto immune disease , Vaccine, toxins, toxoids, antiserum. Basic principles ofimmunological detection of pregnancy and immunohistochemistry.				
		FNTACOR12P: FOOD MICROBIOLOGY AND IMMUNOLOGY (PRACTICAL)	4.Gram staining 5.Bacteriological Analysis of Water by MPN method 6.Ouchterlony double diffusion test in agar-gel. .	Hands on offline practical	Assignment/ class tests/practical demontration/notebooks	8hrs 10hrs 8hrs	Dr. Tanima Paul(Das)
		FNTADSE02T: ENTREPRENEURSHIP IN FOOD INDUSTRY (THEORY)	**2.Food Business management** SWOT Analysis for business and for competitors, Preparation of business plan, Preparation of project	PDF, PPT, ICT	Assignment	10hrs	Dr. Guddi Tiwary

			report, Methods of Arrangement of inputs – finance and material, Tax planning. **3.Personality development and communication skills** Communication skills and Personality Development, Intra personal communication and Body Language, Inter personal Communication and Relationships , Leadership Skills , Team Building and public speaking, Corporate Grooming, Dressing Etiquette, Preparing for Interview, Emotional Quotient.			20hrs	
		FNTADSE02P: ENTREPRENEURSHIP IN FOOD INDUSTRY(PRACTICAL)	3. Tax Planning under the head Salary. 4. Visit to a food industry.	Field Visit, assessment	Assignment	10hrs 10hrs	Dr. Guddi Tiwary
		FNTADSE03T: FOOD BORNE DISEASES AND FOOD TOXICOLOGY(THEORY)	**5.Hygiene and sanitation** Hygiene and sanitation: Contamination, control methods using physical and chemical agents, use of preservatives, pest control management,	Lecture method; Chalkboard, power point presentation and e-resources , e-books , text books,	Class assignments	8hrs	Dr. Priyadarshini Chakraborty

			personal hygiene. **6. Food safety management** Food safety management: Concept of safety management, prerequisites- GHPs, GMP, HACCP etc**.** **7. Toxic agents in food** Toxic agents in food: Botulism, lathyrism, Ciguatoxins, Tetrodotoxins, Saxotoxins, conotoxins, Antivitamins, Haemagglutins, Cyanogenicglycosides, Strychnine, Solanine, atropine, Muscarine	reference books, journals and notes		6hrs 8hrs	Dr. Priyadarshini Chakraborty
		FNTADSE03P: FOOD BORNE DISEASES AND FOOD TOXICOLOGY(PRACTICAL)	5. Assessment of physico chemical properties of waste water. 6. Isolation and enumeration of bacteria from rotten food bread and vegetables. 7. Testing of sanitizers and disinfectants. 8. Study of phenol coefficient of sanitizers.	Offline hands on practical	Assignments	5hrs 5hrs 5hrs 5hrs	Dr. Priyadarshini Chakraborty

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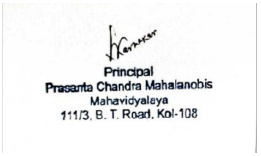
			9. Visit to Food industry and preparation of report.			5hrs	
	Programme Course	**FNTGDSE01T-PUBLIC HEALTH NUTRITION (THEORY)**	**4.Contamination of food** General idea about the contamination of food (Chemical and microbial)-Sources and transmission,Elementary ideas about food toxins, aflatoxin& food toxicology with reference to Lead, Cadmium & Zinc. **6.Contamination of water** Contamination of water and prevention of contamination, different methods of water purification, water – borne diseases, elementary idea of microbiology of water-borne pathogens, diarrhoea, dysentery, typhoid, hepatitis, preventive measures and	study material, Chalkboard, Lecture method	Assignment/ class tests	8hrs 12hrs	Dr. Guddi Tiwary

			dietary management of such diseases. **7. Community waste management** Community waste management: types and methods of disposal of wastes, sewage disposal and treatment.			5hrs	
		FNTGDSE01P-PUBLIC HEALTH NUTRITION (PRACTICAL)	3. Field visit (health centre, immunization centre, ICDS, MCH centre, NGOs etc.)	Field visit	Assignment	15hrs	Dr. Guddi Tiwary



Recommended Text books:

For FNTACOR11T:

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.

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Lesson Plan- 2020-2021

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).	Offline class. Powerpoint Presentation. Lecture. Board work. E-books, Study materials	Class Assignment	10hrs	Dr. Priyadarshini Chakraborty
			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 -	Offline class. Powerpoint Presentation. Lecture. Board work, Study materials as pdf	Class Assignment	20hrs	Dr. Priyadarshini Chakraborty

			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.	Offline hands-on practical class Offline hands-on practical class Offline hands-on practical class	Continuous assessment Continuous assessment Continuous assessment	10hrs 6hrs 15hrs	Dr. Priyadarshini Chakraborty Dr. Priyadarshini Chakraborty Dr. Priyadarshini Chakraborty
		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	Lecture method; Chalkboard, PDF	Assignments	25hrs	Sahin Sultana
		FNTACOR04P: HUMAN PHYSIOLOGY (PRACTICAL)	1. Test for Visual acuity, Colour vision. 2. Identification with reasons of	Offline hands-on practical class	Assignments	10hrs 25hrs	Sahin Sultana

			histological slides (Lung, Liver, Kidney, Small intestine, 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	Sahin Sultana

		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 permanent sections (Blood cells, Stomach, Small intestine, large intestine, Liver, pancrea**s).**	Offline hands onpracticals	Assignments	6hrs 6hrs 6hrs	Sahin Sultana
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	Online class. Powerpoint Presentation and Lecture. E-books, Study materials	Class assignment	15 hrs 10hrs	Dr. Priyadarshini Chakraborty

			• .Factors regulating enzyme activities, • Isoenzymes, Pro-enzymes, Ribozymes, Abzymes, • Concept of Rate limiting enzymes.				
		FNTACOR03P: FOOD CHEMISTRY, BIOPHYSICS AND BIOCHEMICAL PRINCIPLES(PRACTICAL)	1. Protein estimation by Biuret and Lowry methods. 2. Estimation of urea and uric acid in blood. 3. Determination of acid value of oils by titrimetric method. 4. Determination of osmotic pressure of colloidal solutions. 5. Determination of specific gravity of liquid (fruit juice, blood).	Offline Hands-on Practical Class	Class assignments	6hrs 6hrs 6hrs 6hrs 6hrs	Dr. Priyadarshini Chakraborty
		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	Sahin Sultana
		FNTACOR04P: HUMAN PHYSIOLOGY (PRACTICAL)	1. Qualitative determination of glucose in blood or urine. 2. Total count (TC) and Differential count (DC)	Offline hands on practical	Assignments	10hrs 10hrs	Sahin Sultana
	Programme Course	**FNTGCOR02T: HUMAN BODY AND NUTRITION (THEORY)**	**1. Digestive system and Digestion** • Digestive system: Structures involved	Lecture method; Chalkboard, PDF	Assignments	20hrs	Sahin Sultana

			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** • 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.			6hrs 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	Sahin Sultana

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.

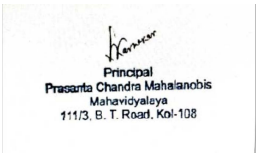
6. Debajyoti Das, Biochemistry, 14th Ed, Academic publishers.

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.



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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 in hours	Name of the Teacher assigned
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. Guddi Tiwary

		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). 3. Growth charts - plotting of growth charts, growth monitoring and promotion.	Offline hands on practical, graphical interpretation, study visits to community centers like ICDS etc.	Class assignment ,student seminar	10hrs 10hrs 6hrs	Dr. Guddi Tiwary
		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	Lecture method; Chalkboard, PDF, WHO website e-material, Indian Academy of Pediatrics e - material	Assignments	6hrs 6hrs 10hrs	Dr. Guddi Tiwary

			disease transmission, modes of transmission of disease. **4.Public health** • Definition of public health, relation between health and nutrition.			6hrs	
		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 preparation of low cost and medium cost nutritious/ supplementary recipe.	Offline hands on practical	Assignment	20hrs 15hrs	Dr. Guddi Tiwary
		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,	Lecture method; Chalkboard, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh	Assignment	4hrs 15hrs 12hrs	JuthiSaha

			• Hypertension: Aetiology, Risk factors, Patho-physiology, Management **4.Nutrition and respiratory health** • Physiology and functions of the respiratory system, • Nutritional management of Asthma			6hrs	
		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	Offline hands on practical class	Assignment	20hrs	JuthiSaha
guidance	**Hons and Programme course**	**FNTSSEC02M: FIELD STUDY IN CLINICAL / COMMUNITY SETTING**	**Theory:** Introduction to clinical nutrition, clinical conditions requiring dietary intervention,	Lecture method; Chalkboard, Study materials as pdf	Class assignment	5hrs	Dr. Guddi Tiwary
			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	Lecture method; Chalkboard, Study materials as pdf, study visits to old age home, NGO, ICDS centres,ANC clinics using standardized proforma and checklists, graphical representation of observations by demonstrating IEC materials of WHO, ICMR, NIN, CFTRI etc. Teaching aids developed	Demonstration of teaching aids, student seminar, assignment	10hrs	Dr. Guddi Tiwary

			appropriate observation check lists will be made and used)	under guidance.			
	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 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	Lecture method; Chalkboard, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh	Assignment	8hrs 12 hrs 8hrs	JuthiSaha
		FNTGCOR04P: DIETETICS(PRACTICAL)	Planning and Preparation of fluid diet, soft and solid diet.	Offline 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	Online class. Powerpoint Presentation and Lecture. E resources (E-PG path Sala) Study materials as pdf	Class assignment	8hrs 8hrs	Dr. Guddi Tiwary

			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. 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.	Offline hands on practical, graphical interpretation, study visits to community centers like ICDS etc.	Class assignment, ppt presentation in student seminars, demonstration of audiovisual aids for community	10hrs 10hrs	Dr. Guddi Tiwary
		FNTACOR09T: EPIDEMIOLOGY AND PUBLIC HEALTH(THEORY)	1**. Immunization** • Immunization : definition. Host defenses and immunity, immunizing	Lecture method; Chalkboard, PDF, WHO website e-	Assignment	8hrs	Dr. Guddi Tiwary

			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, 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	material, Indian Academy of Pediatrics e - material Lecture method, PPT, Study material and E-book, text book referred.		5hrs 6hrs	Dr. Priyadarshini Chakraborty
		FNTACOR09P: EPIDEMIOLOGY AND PUBLIC HEALTH(PRACTICAL)	1. Field visit (health centre, immunization centre, ICDS, MCH centre, NGOs etc.)	Visit to the institutions for data collection	Student Seminar	20hrs	Dr. Guddi Tiwary
		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,	Lecture method; Chalkboard, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh	Assignment	15hrs	JuthiSaha

			• 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 Asthma			6hrs	
		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	Offline 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 method; Chalkboard, Study materials as pdf	Class assignment	5hrs	Dr. Guddi Tiwary
			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 method; Chalkboard, Study materials as pdf, study visits to old age home, NGO, ICDS centres, ANC clinics using 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. Guddi Tiwary
	Programme Course	**FNTGCOR04T: DIETETICS (THEORY)**	**1. Dietary management of different diseases** • Dietary management in Gastro intestinal diseases	Lecture method; Chalkboard, power point presentation	Assignment	24hrs	JuthiSaha

			(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, sources, symptoms, diagnosis, treatment, food intolerance	and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh		8hrs	
		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.	Offline practical Class	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.

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Lesson Plan- 2020-21

Semester VI 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-April	**Hons**	**FNTACOR13T: FOOD PROCESSING AND FOOD TECHNOLOGY (THEORY)**	**1.Food Storage and Spoilage** • Contamination and microorganisms in the spoilage of different kinds of foods and such as cereal and cereal products, vegetable and fruits, fish and other sea foods, meat and meat products, eggs and poultry, milk and products, canned foods. • Classification of food based on pH, Food infection, food intoxication, definition of shelf life, perishable foods, semi perishable foods, shelf stable foods, • Storage of different kinds of foods and such	Online class. Powerpoint Presentation and Lecture. E resources (E-PG path Sala) Study materials as pdf	Class assignment	10hrs	Dr. Priyadarshini Chakraborty

			as cereal and cereal products, vegetable and fruits, fish and other sea foods, meat and meat products, eggs and poultry, milk and products, spices and canned foods. **2.Food preservation** • Definition, objectives and principles of food preservation. • Different methods of food preservation. : Freezing and Refrigeration • Introduction to refrigeration, cool storage and freezing, definition, principle of freezing, freezing curve, changes occurring during freezing, types of freezing i.e. slow freezing, quick freezing, introduction to thawing, changes during thawing and its effect on food. • Thermal Processing- Commercial heat preservation methods: Sterilization, commercial sterilization, Pasteurization, and blanching. • Drying and Dehydration - Definition, drying as a means of preservation, differences between sun drying and dehydration (i.e. mechanical drying), heat and mass transfer, factors affecting rate of drying, normal drying curve, names of types of driers used in the food industry. • Evaporation – Definition, factors affecting evaporation, names of evaporators used in food industry. Units of radiation, kinds			12hrs	

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			of ionizing radiations used in food irradiation, mechanism of action, uses of radiation processing in food industry, concept of cold sterilization.				
		FNTACOR13P: FOOD PROCESSING AND FOOD TECHNOLOGY (PRACTICAL)	1. Study on Blanching and Browning Process. 2. Preparation of Fruit preserves (Jam, Jelly). 3. Preparation of vegetable preserves.(Pickles) 4. Dehydrated Products – tray drying, sun drying etc. 5. Tomato Processing.	Offline hands on practical and visit to Food preservation unit	Class assignment, Evaluation of visit report	6hrs 6hrs 6hrs 6hrs	Dr. Priyadarshini Chakraborty
		FNTACOR14T: RESEARCH METHODOLOGY AND BIOSTATISTICS(THEORY)	**1.Sampling of data and analysis** • Variable, parameter, statistics. Frequency distribution. Cumulative frequency. Graphical presentation techniques including Histogram, Bar chart, Pie chart along with the concepts of frequency polygon. Mean, median, mode, Standard Deviation and Standard Error of mean	Lecture method; Chalkboard, PDF books	Assignment	20hrs	Dr. Guddi Tiwary
		FNTACOR14P: RESEARCH METHODOLOGY AND BIOSTATISTICS(PRACTICAL)	1. Assignment for calculation of mean, median, mode.	Lecture method; Chalkboard, PDF books	Assignment	20hrs	Dr. Guddi Tiwary
		FNTADSE04T: FOOD & BEVERAGE MANAGEMENT (THEORY)	1. **Introduction to Food Service** • Introduction to food service industry in India, factors contributing to the growth of food service industry, sectors of food service industry, food service operations, Kinds of food service establishments,	Lecture method; Chalkboard, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala,	Assignment	20hrs	Ms. JuthiSaha

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			environmental factors influencing food service operations, styles of food service	Egyankosh;			
		FNTADSE04P: FOOD & BEVERAGE MANAGEMENT (PRACTICAL)	Planning of A Food Service Unit : Preliminary Planning, Survey of types of units, identifying clientele, menu, operations and delivery	PDF, Lecture and Visit to food and beverage establishment	Assignment	25hrs	
		FNTADSE05T: DAIRY TECHNOLOGY (THEORY)	• **Introduction** • Status of dairy industry in India • **Physical properties of milk** • Color, taste, pH and buffering capacity, refractive index, viscosity, surface tension, freezing, boiling point, specific heat, OR, electrical conductivity. • **Lactose** Lactose (alpha and beta forms and their differences) Significances of lactose in dairy industry.	Powerpoint presentation , Lecture method, Chalk board, Study material	Class assignments	2hrs 10hrs 4hrs	Dr. Priyadarshini Chakraborty
		FNTADSE05P: DAIRY TECHNOLOGY (PRACTICAL)	1. To perform platform tests in milk.(Acidity,COB,MBRT,specificgravity,SNF) 2. To estimate milk protein by Folin method. 3. To estimate milk fat by Gerber method.	Offline hands on practical and visit to Dairy Industry		10hrs 6hrs 6hrs	Dr. Priyadarshini Chakraborty
	Programme Course	**FNTGDSE03T-FOOD COMMODITIES(THEORY)**	**1. Perishable Food Commodities** Milk, Meat, Fish, Egg and Poultry- Introduction, composition, types, processing, products, uses in Indian cookery. **2. Semi Perishable Food**	Lecture method; Chalkboard, PDF books	Class assignment.	16hrs 16hrs	Dr. Guddi Tiwary

			Commodities Fruits and Vegetable, Fats and Oils- Introduction, composition, types, processing, products, uses in Indian cookery.				
		FNTGDSE03P-FOOD COMMODITIES(PRACTICAL)	Project formulation and presentation of project in a seminar (especially on the market survey of food commodities).	Lecture method; Chalkboard, PDF books, Hands on training via market survey	Class assignment. Evaluation of market survey reportAssignment	20hrs	Dr. Guddi Tiwary
May-June	**Hons**	**FNTACOR13T: FOOD PROCESSING AND FOOD TECHNOLOGY (THEORY)**	**1. Preserved Products** Jam, Jelly, Marmalade, Sauces, Pickles, Squashes, Syrups types, composition and manufacture, selection, cost, storage, uses and nutritional aspects. **2.Food Adulteration** Definition, Classification, Different types of adulterants	Online class. Powerpoint Presentation and Lecture. E resources (E-PG path Sala) Study materials as pdf	Class assignment	13hrs 5hrs	Dr. Priyadarshini Chakraborty
		FNTACOR13P: FOOD PROCESSING AND FOOD TECHNOLOGY (PRACTICAL)	1. Tomato Processing. 2. Fruit Pulping/Juice/Beverages production. 3. Preparation and Standardization of Traditional Indian Fermented Food. 4. Visit to Food Processing and Preservation unit. 5. Detection of Adulterants in common Food Stuffs like Milk, Oil, Laddu, Turmeric etc	Offline hands on practical and visit to Food preservation unit	Class assignment, Evaluation of visit report	4hrs 4hrs 4hrs 6hrs 10hrs	Dr. Priyadarshini Chakraborty
		FNTACOR14T: RESEARCH METHODOLOGY AND BIOSTATISTICS(THEORY)	**1.Preparation of report** a. Graphical and diagrammatic presentation. b. Interpretation of –	Lecture method, Chalkboard, PDF Books	Assessment	20hrs	Dr. Guddi Tiwary

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			Meaning of interpretation, Technique of interpretation, c. Precaution in interpretation- Interpretation of tables and figures. d. Report writing – Significance of report writing, Steps in writing report, Types of reports				
		FNTACOR14P: RESEARCH METHODOLOGY AND BIOSTATISTICS(PRACTICAL)	1. Assignment for calculation of standard deviation, standard error of mean and students''t' test with provided data.	PDF, Chalkboard, Lecture method	Assessment	25hrs	Dr. Guddi Tiwary
		FNTADSE04T: FOOD & BEVERAGE MANAGEMENT (THEORY)	**1.Food Production & Menu Planning** • Food production methods, food production process, cooking methods ,Menu planning: Importance of menu, Factors affecting menu planning, Menu planning for different kinds of food service units , Food Purchase and Storage, Quantity Food production: Standardization of recipes, quantity food preparation - techniques, recipe adjustments and portion control ,Hygiene and Sanitation	Lecture method; Chalkboard, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh;	Assignment	25hrs	JuthiSaha
		FNTADSE04P: FOOD & BEVERAGE MANAGEMENT (PRACTICAL)	Planning the set up a) Identifying resources b) Developing Project plan c) Determining investments d) Project Proposal.	Offline hands on practical and visit to Food and beverage institution	Assignment	25hrs	JuthiSaha
		FNTADSE05T: DAIRY TECHNOLOGY (THEORY)	**1. Milk fat** • Composition and structure, factors affecting melting point, boiling point, solubility and Refractive Index, fat constants (saponification value, iodine value, RM	PDF of study material, Chalkboard, Lecture method, E-books	Class assignments	10hrs	Dr. Priyadsrhini Chakraborty

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			value, Polenske value, peroxide value). Chemical reactions of fat (hydrolysis, auto-oxidation), condition favouring auto-oxidation, prevention, measurement of auto-oxidation. **2. Protein and Enzymes** • General structure, amphoteric nature, difference between casein and serum protein, different types of casein (acid and rennet), uses of casein, fractionation of protein. Enzymes- catalase, alkaline phosphatase, lipases and proteases.			10hrs	
		FNTADSE05P: DAIRY TECHNOLOGY (PRACTICAL)	1. Preparation of flavoured milk/. Pasteurization of milk. 2. To prepare casein and calculate its yield. 3. Visit to a milk industry.16	Offline hands on practical	Assignments	6hrs 6hrs 6hrs	Dr. Priyadsrhini Chakraborty
	Programme Course	**FNTGDSE03T-FOOD COMMODITIES(THEORY)**	**1. Non Perishable Food Commodities** • Cereals, Pulses, Legumes, Oil seeds and spices-Introduction, composition, types, processing, products, uses in Indian cookery. **2. Beverages** • Tea; Coffee. Chocolate and Cocoa Powder-Processing, cost and nutritional aspects, other beverages-Aerated beverages, juices.	study material, Chalkboard, Lecture method	Assignment	16hrs 12hrs	Dr. Guddi Tiwary
		FNTGDSE03P-FOOD COMMODITIES(PRACTICAL)	Project formulation and presentation of project in a seminar (especially on the market survey of food	Poster making, Chalk board,	Assignment	20hrs	Dr. Guddi Tiwary

			commodities).	lecture, power point presentation			

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:

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Lesson Plan- 2020-21

SemesterIHonors. &ProgrammeCourse

NameoftheDepartment:ECONOMICSODDSEMCBCS

Period	Hons/ Programme Course	PaperName 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?Scopeandmethodofeconomics;theeconomic problem: scarcity andchoice; Distinction betweenMicroeconomicsandMacroeconomics; the question ofwhat to produce, how to produceand how to distribute output;thebasic competitive model; prices,UNIT4:Production and CostProduction function, Total, Averageand Marginal products, Isoquantsandeconomicregionsofproduction,Cost minimization and expansionpath, Elasticity of substitution,Economies of scale, Cobb Douglas,Fixed coefficient and CES functions,Short run and long run costs,Derivation of the cost function fromproductionfunction	Ictclassroom, Youtubelecture video, Offlinemethods with chalk andduster	OfflineInternal examinations Twoexaminatios10marks each	10 12	SS SBC

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September-November		**ECOACOR02T**	UNIT-1PreliminariesConcept:Sets and set operations; relations;functions and their properties;number systems. Set Theory:Definition of aset and discussion ofrelated concepts; Set types;Operations on sets; Nested sets;Cartesian product; Concept ofEuclidean Space Functions andRelations: Definitions; Concepts of'range', 'domain' and 'mapping';Explicitandimplicitfunctions;Typesof functions and correspondences(polynomial,exponential,logarithmic,power) UNIT 3 .Simultaneous LinearSystemsandRelatedApplicationsofMatrix Algebra: (12 hours) Vectorspaces: algebraic and geometricproperties, scalar products, norms,orthogonality;lineartransformations: properties, matrixrepresentations and elementaryoperations; systems of linearequations: properties of theirsolution sets; determinants:characterization, properties andapplications. UNIT- 6 Free and constrainedoptimization; Examples ofconstrained optimization fromconsumer and producers theories;Static and dynamic optimizationproblems; applications Applications:Equilibrium under cardinal andordinal utility theory; Maximizationof Profit in different market form,Minimizationofcostofproductioninlongrun.	Ictclassroom, Youtubelecture video, Offlinemethodswith chalk andduster	OfflineInternal examinations Twoexaminatios10marks each	10 15 15	SS PB SBC
September-November	**Programme Course**		UNIT-3 Producers'BehaviourConceptofProduction- Factors of Production-ProductionFunction:ConceptsofTP,APandMP.Derivation of APandMPcurvegraphicallyfrom TP curve-Lawof Variable Proportions-Isoquantsand its Properties-Expansion Path-LawsofReturnstoScale.ConceptsofRevenue- TR, AR, MR. Derivation ofAR and MR curve from TR curve – Relation concerning AR, MR andElasticity of Demand. UNIT-1Basic Concepts: (10hours)Whatiseconomics?Scopeand method of economics; theeconomic problem: scarcity andchoice; Distinction betweenMicroeconomicsand Macroeconomics; Concept ofMarket,Demand&Supply–Market	Ictclassroom, Youtube lecture video, Offlinemethods with chalk andduster	OfflineInternal examinations Twoexaminatios10marks each	15 10	SBC SS

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			equilibrium. Elasticity of Demand :Price elasticity of DemandFactorsaffecting the price elasticity ofdemand-Measurementofpointpriceelasticity of demand and Arcelasticity- Income elasticity ofdemand. UNIT-2Consumers'Behaviour(15hours)MarginalUtility-LawofDiminishing Marginal Utility-Derivation of demandcurve frommarginalutilitycurve-Consumers'surplus. Indifference curve:Definition and Characteristics –Budget line –Consumers'EqulibriumIncomeeffectand Substitution effect-Graphicalpresentation to show Price effect isthesummationofIncomeeffectandSubstitution effect- Inferior goodsand Giffen goods.			15	PB
December-January	**Hons.**	**ECOACOR01T**	UNIT -2. Supply and Demand:How Markets Work, Markets andWelfare (12 hours) Markets andcompetition; determinants ofindividual demand/supply;demand/supplyscheduleanddemand/supplycurve;marketversusindividual demand/supply; shifts inthedemand/supply curve, demandand supply together; how pricesallocate resources;elasticity and itsapplication;controlsonprices;taxes and the costs of taxation;consumersurplus; producer surplusand the efficiency of the markets. UNIT-3The Household Theconsumption decision - budgetconstraint, consumption andincome/pricechanges,demandforall other goods and pricechanges;description of preferences(representingpreferenceswithindifferencecurves); properties ofindifferencecurves; consumer'soptimumchoice;income and substitution effects (Hicks&Slutsky); Ordinary andCompensated demand curves,Inferior goods and Giffen goods,Price consumption and incomeconsumptioncurves UNIT -5.Market StructureDifferenttypesofmarketstructures-Perfect competition, Monopoly,Monopolistic Competition andOligopoly	Ictclassroom, Youtube lecture video, Offline method swith chalk and duster	Offline Internal examinations Twoexaminations10marks each	12 10 30	SS SBC PB

December-January	**Hons**	**ECOACOR02T**	UNIT-2'integral' (stress on bothintuitive and mathematicalunderstanding);differentiablefunctions:Applicationsofdifferentialandintegralcalculus toBriefReviewof Differential and Integral Calculus:Concepts of 'limits and continuity','derivative','partialderivative','totaldifferential' and the study offunctions: level curves; slope andcurvature of functions, area under acurve etc. second and higher orderderivatives: properties andapplications.Applications: Expenditure function and itsproperties; Shepherd's Lemma;Indirect Utility Function; Roy'sIdentity; Slutsky equation anddecomposition of price effect;Propertiesofdemandfunctions. Work-leisure choice; savingsfunction,Totalaverageandmarginal Cost & Production,saving &investment function Consumptionfunction, UNIT-6 Multi-variableoptimization Free and constrainedoptimization; Examples ofconstrained optimization fromconsumer and producers theories;Static and dynamic optimizationproblems; applications Applications:Equilibrium under cardinal andordinal utility theory; Maximizationof Profit in different market form,Minimizationofcostofproductioninlongrun	Ictclassroom You,tube lecturevideo, Offlinemethods with chalk andduster	Offline Internal examinations Twoexaminations10marks each	15 15	SBC PB
December-january	**Programme Course**	ECOGCOR01T	UNIT-4MarketStructure:PerfectCompetition,Characteristics ofPerfectly Competitive Market. Short–run and Long-run equilibrium ofPerfectly Competitive firm andindustry. UNIT-6 Market Structure:ImperfectCompetitionConceptandCharacteristicsofMonopoly Market– Degree of Monopoly Power. Monopolistic competition andOligopoly-Featuresandexample UNIT-6 6.Theory ofDistribution(15hours) (i) Marginal Productivity Theory ofDistribution (ii) Rent : (a) RicardianTheory , (b) Modern Theory , (c)Quasi- Rent. (iii) Wage: MarginalProductivity Theory of Wages – RoleofTradeUnioninWageDetermination under Competitive Set up. (iv) Interest:RealandMonetary Interest	Ictclassroom, You Tube lecture video, Offline methods with chalk and duster	Offline Internal examinations Twoexaminations10marks each	10 10 15	SBC PB SS

			Rate – Lonable Fund Theory ofInterest Rate – Liquidity Theory ofInterest Rate.(v)Profit:Gross ProfitandNetProfit– DifferenceBetweenProfit and Other Factor Incomes(conceptsonly)				

RecommendedTextbooks:

Suggested Readings:
K.SydsaeterandP.Hammond,*MathematicsforEconomicAnalysis*,PearsonEducationalAsia:Delhi, 2002.ECOACORO1T:

Blume,LawrenceandCarlSimon(1994),*MathematicsforEconomists*,Norton.Chiang,Alphaand KevinWainwright(2005), *FundamentalMethodsof MathematicalEconomics*,FourthEdition,McGraw-Hill

Baldani,BradfieldandTurner,

AnIntroductionto*MathematicalEconomic*,CengageLeaening:2007.ECOACOR02T.Suggested Readings:
K.SydsaeterandP. Hammond,*MathematicsforEconomicAnalysis*,PearsonEducational Asia:Delhi, 2002.

Blume,LawrenceandCarlSimon(1994),*MathematicsforEconomists*,Norton.Chiang,Alphaand KevinWainwright(2005), *FundamentalMethodsof MathematicalEconomics*,FourthEdition,McGraw-Hill

Baldani, BradfieldandTurner,AnIntroductionto*MathematicalEconomic*,CengageLeaening

INTERNALEXAMINATIONS

SEMESTER I BSC GENERAL: will be 5th week of January 2021

SEMESTERIIIBSCGENERAL:willbe1stweekofFebruary2021

SEMESTER V BSC GENERAL: will be 2nd week of February

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Lesson Plan- 2020-21

Semester III Honors. &Programme Course

NameoftheDepartment:ECONOMICSODDCBCS

Period	Hons/ Programme Course	Paper Name and PaperCode	Topics	Methods and materials	Methodsof Evaluation	Number ofclasses allotted inhours	Nameof the Teacher assigned
August-September	**Programme Course**	ECOGCORO3T	UNIT-2, DevelopmentPlanning & its necessityBalanced vs. Unbalancedgrowth.Complementary Rolesof Agriculture and Industry -Role of Technology inAgriculture and Industry. UNIT-4Concept and Roleof Domestic Capital FormationinanUnderdeveloped Country:The Problems - Incentives forSavings and Investment. UNIT-1. Basic Concepts ofDevelopment: Meaning ofgrowth and development,Distinction between EconomicGrowth and EconomicDevelopmentGrowthindicators-NNI and PCI, Concept andformulation of HDI.	Ictclassroom, Youtubelectu revideo, Offline m ethods with chalk and duster	Offline Internal examinations Twoexaminatios10 marks each	15 10 15	SBC SS PB
November-january	**Programme Course**	ECOGCORO3T	UNIT-3PopulationandEconomicDevelopment:TheTwo Way Relation. UNIT-5ForeignInvestment:Different forms -Their roles inEconomicDevelopmentUNIT -6.Role ofInternationalInstitutions:IMF &World Bank in economicdevelopment of the LDCSUNIT-7 . Gender RelatedIssues concept of GDI & instances of GenderDiscriminationinthesociety	Ictclassroom You,tubelectu revideo, Offlinemethodswithchalkandduster	OfflineInterna l examinations Twoexaminatios10 marks each	10 8 8	PB SS PB

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Lesson Plan- 2020-21

Semester V Honors. &Programme Course

NameoftheDepartment:ECONOMICSCBCSODD

Period	Hons/ Programme Course	PaperName and Paper Code	Topics	Methodsand materials	Methods of Evaluation	Number of classes allotted inhours	Nameof the Teacher assigned
Augustto September	**Programme Course**	ECOGCORO5T	UNIT-1Variable,Attribute,PrimaryandSecondary Data, Population and Sample,CensusandSampleSurvey,Classification ofdata and Tabulation. UNIT2FrequencyDistributions:Frequencydistribution of an Attribute, Frequencydistribution of a discrete variable, Frequencydistribution of a continuous variable,Construction of Frequency distribution fromraw data, Cumulative Frequency distributionUNIT-3.Charts and Diagrams : Meaningandfunctions of Graphs – Types ofCharts andDiagrams – Line Diagram, Bar Diagram, PieDiagram, Pictogram, Statistical Map,Frequency Polygon, Histogram, Step Diagram,Ogive or Cumulative Frequency Polygon,FrequencyCurve	Ictclassroom, You tubelecturevideo,Offlinemethodswithchalkandduster	OfflineInternalexaminationsTwoexaminatios10markseach	15 10 15	PB SS SBC
Novemberto January	**Programme Course DEVELOPMENT ECONOMICS**	ECOGCORO5T	2UNIT4.Measures ofCentralTendency:Arithmetic Mean (AM), Geometric Mean(GM),HarmonicMean(HM),Median,Mode(Definitions,formulaeandsimplenumericalproblems). UNIT-5 Measures of Dispersion: Meaning andnecessity, Range, Quartile Deviation (QD),MeanDeviation(MD),StandardDeviation(SD),CoefficientofVariation(CV),(Conceptsonly.	IctclassroomYou,tubelecturevideo,Offlinemethods withchalkandduster	OfflineInternalexaminationsTwoexaminatios10markseach	15 15	SBC PB

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Lesson Plan- 2020-21

SemesterIIHonors. &Programme Course

NameoftheDepartment: ECONOMICS EVENSEMESTERCBCS

Period	Hons/ Programme Course	Paper Nameand Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted inhours	Nameof the Teacher assigned
March-April	**Hons.**	**ECOACOR O3T**	**UNIT 1 Introduction to Macroeconomics and National Income Accounting** Basicissuesstudiedin macroeconomics ;measurementofgrossdomestic product; income,expenditureandthecirc ularflow;differentmethodsof calculating NI; measurement of costof living – CPI, GDP deflator; measuring joblessness – Unemployment rate,Unemployment and GDP – Okun's Law; nationalincomeaccountingfor an open economy; balance of payments: current and capital accounts; NI as a measure of economic welfare	0ffline methodis used using board Chalk duster ICT classes, youtube lecture videos Special lectures seminars	Offline evaluation of Internalexaminations	10	PB
			UNIT2. Money Functionsofmoney; quantity theory of money; determinationofmoneysupply and demand;creditcreation;tools of monetary policy			9	SS
			UNIT4. The Closed EconomyintheShortRun Classical and Keynesian systems (difference in concepts Simple Keynesian model o f income determination,			7 .	SBC

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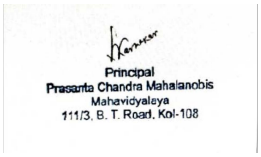
	Hons/ Programme Course	Paper Nameand Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted inhours	Nameof the Teacher assigned
March-April	**Hons**	**ECOACORO4T**	**UNIT2.MeasuresofCentral tendency** The mean, median, mode;geometricmean, harmonicmean,theirrelative merits and demerits**UNIT7. Time series** Components,measurementof trend and statistical fluctuations; Two variable linear curve fittinganalysis-estimationof regressionlines(Leastsquare method) and regression coefficients - their interpretation and properties, standard error of estimate **UNIT4. Measures of Skewnessand Kurtosis :Interpolationand Extrapolation** **UNIT1. Basic concepts**: Population and sample, parameterandstatistic;Data Collection: primary and secondary data, methods of collection of primary data; Presentation of Data: Univariatefrequency distribution; cumulative frequency; graphic and diagrammaticrepresentationof data.	0ffline methodis used using board Chalk duster ICT Classes you tube lecture videos Special lectures seminars.	Offline evaluation of Internalexaminations	5 8 5 8	PB SS SS SBC
May-June	**Hons.**	**ECOACORO3T INTRODUCTORY MACROECONOMIC**	**UNIT3. Inflation** Inflationanditssocialcosts; DemandPull andCost Push inflation; hyperinflation; antiinflationary Policies	0ffline methodis used using board Chalk	Offline evaluation of Internalexaminations	10	PB

		S	**UNIT 4** Multipliers,ISLMmodel; fiscal and Monetarymultipliers.	duster ICT classesy ou tube lecture videos Special lectures seminars		10	SBC
Period	**Hons/ Programme Course**	**Paper Nameand Paper Code**	**Topics**	**Methods and materials**	**Methods of Evaluation**	**Number of classes allotted inhours**	**Nameof the Teacher assigned**
May-June		**ECOACOR O4T**	**UNIT 3 Measures of Dispersion**: absolute and relative - range, mean deviation, standard deviation, coefficient of variation, quartiledeviation,theirmerits and demerits **UNIT8. Index Numbers** Price, quantity Index Numbers: Index number as weightedaverages,Priceand quantityindex numbers, ProblemsintheConstruction of Index Numbers, Tests for index Numbers, ChainbasedIndex,Costof Living Index Number, WholesalePriceIndexand Cost of Living Index,UsesofIndexNumbers, Index numbers as indices of wellbeing, Stock market indices. **UNIT 7. Time series** Components,measurementof trend and statistical fluctuations; Two variable linear curvefitting analysis - estimationof regression lines (Least square method) and regression coefficients-theirinterpretation and properties, standard error of estimate	0ffline methodis used using board Chalk duster ICT classes, you tube lecture videos Special lectures seminars	Offline evaluation of Interna lexaminations	10 I0 8	PB PB SS

			UNIT5. Bivariate frequency distribution: Simple Correlation: scatter diagram, samplecorrelationcoefficient - Karl Pearson‟s correlation coefficient and itsproperties, probable error of correlation coefficient, Spearman's rank correlation coefficient, partial and multiple correlation, Regression Analysis:Propertiesoflinearregression, 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: Valuesinparenthesesindicate number of Lecture hours for thecorrespondingunit]			4 10 5	SS SBC SBC



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Lesson Plan- 2020-21

SemesterI/IIHonors. &ProgrammeCourse

NameoftheDepartment:ECONOMICS_EVENSEMESTER

Period	Hons/ Programme Course	PaperName and Paper Code	Topics	Methods and materials	Methodsof Evaluation	Number of classes allotted inhours	Nameof the Teacher assigned
March-April	**Programme Course ECONOMICS GENERAL**	**(ECOGCOR02T)**	**UNIT1.National Income**National Incomeand its measurement-differentmethodsand theirdrawbacks; GDP andGNP;Difference betweenNominal and real GNP/GDP; GNP/GDPasatrue indexofNation's welfare;conceptof HDI. **UNIT2.Macro economictheories**(i) ClassicalMacro economictheoryand KeynesianTheory (conceptsandhistorical background,howthey aredifferent) **UNIT3Moneyand banking**(i)Functionsof Money–Valueof MoneyDifferent ConceptsofMoney: M1,M2,M3and M4	0ffline methodis 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	0ffline methodis used	Offline evaluation of Internal	12	SBC

			NationalIncomeandits change since inception of Planning.Occupational patterninIndia-Atrend 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 unemploymentand underemployment. **UNIT 2. Human resources and economy** Size and growth rate of population in India. Changes in sex composition since inception of planning.Population policyandpopulation projections for India. **development**: **UNIT3. Agriculture**: Causes for low productivity.Targeted public distribution system.New agricultural policy; Greenrevolutionand its prospects Land reforms and its appraisal. Effects of GATT on Indian Agriculture.	using board Chalk duster ICT classes, you tube lecture videos Special lectures seminars	examinations	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; BenefitPrinciple;Ability to Pay Principle; Incidence and Burdenof Taxes. **UNIT 4. Public ExpenditureandPublic Debt** Meaning and Classification of Public Expenditure; government budget and its types; Sources of revenue of Central andStategovernments in India	0ffline methodis used using board Chalk duster ICT classes,you tube lecture videos Special lectures seminars	Offline evaluation of Internal examinations	5 10 10	SS SBC PB
May-June		**ECOGCOR02T**	**UNIT2. Macro economic theories**(ii) Simple Keynesian Model (SKM) of IncomeDetermination-Consumption Function – Relation between Average and Marginal PropensitytoConsume - Multiplier Theory**UNIT 3 Money and banking**(ii)Conceptsof Bank and Non-bank FinancialIntermediaries – Functions and Credit CreationofCommercial Banks – Central Bank-Functions and Credit Control Measures **UNIT4.Inflation** ConceptsofInflation, Deflationand	0ffline methodis 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 DemandPullandCost PushInflation-Effects of Inflation – Anti-inflationaryFiscaland Monetary Policies.				
		(**ECOHGEC04T)**	**UNIT 5.Banking**: Role of Indian Commercial Banks and Reserve BankofIndia.Monetary Policy of the Reserve Bank of India.Profitability of banks in India. **UNIT 4. Industry** Review of Industrial growthunderplanning. 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 ofIndia'sforeigntrade in the post-Liberalizationperiod	0ffline methodis 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
		ECOGDSE03T)	**UNIT 2. Theory of PublicGood**Overview of Public Good; CharacteristicsofPure	0ffline methodis used using	Offline evaluationof Internal examinations	20	SS

			PublicGood;Distinction between Pure Public GoodandPrivateGood; Market Failure in case of Pure Public Good; Optimal provision of Public Goods; Lindahl Equilibrium **UNIT 3. Taxation**Effects of taxation on income distributionand on savings; the Laffer curve;OptimalTaxation **UNIT 4. Public ExpenditureandPublic Debt** Fiscal Federalism in India; Meaning of Public Debt; Sources of Public Borrowings: internal and external borrowing; Effects of Public Debt	board Chalk duster ICT classes,you tube lecture videos Special lectures seminars		10 10	SBC PB
	SEC	**ECOSSEC02M**	**Unit1INDIANOFFICIAL STATISTICS** **UNIT2EconomicCensus** **UNIT4. Sources of demographicdata** **UNIT4International Statistical System:**	0ffline methodis used using board Chalk duster ICT classes,you tube lecture videos Special lectures seminars	Offline evaluationof Internal examinations		SBC PB PB SS

RecommendedTextbooks:

ECOGCOR02T 1. Gupta , S.B – Monetary Economics , S.Chand& Co. , New Delhi 2. Ahuja , H.L - Macroeconomics3.Mukherjee,Debes–Essentialsof MicroandMacroeconomics,NewCentralBook Agency (P) Ltd.

(**ECOHGEC04T)**1.DuttaR.andK.P.M.Sundaram:IndianEconomy,S.ChandandCo.NewDelhi2.Misra S.K.V. K. Puri: Indian Economy, Himalayas Publishing Co. Mumbai. 3. Agarwal A.N: Indian Economy, VikashPublishingCo.Delhi4.Gupta,S.B.:MonetaryPlanning inIndia,OxfordUniversityPress,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,199410.AGhoshandC.Ghosh,PublicFinance,PrenticeHallIndiaLearningPrivateLimited; 2nd Revised edition (2014)

. **ECOSSEC02M**

1.M.R.Saluja:IndianOfficialStatisticalSystems.2.CSO(MOSPI)Publication:StatisticalSysteminIndia. 3.UnitedNationspublications4.RBI:HandbookofStatisticsforthe IndianEconomy(variousyears)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 Demo

INTERNALEXAMINATIONS

SEMESTERIIGE+DSE: willbeon 5thweekofJune2021

SEMESTERVIGE+DSE:willbeon 5thweekofJune 2021

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

Prasanta Chandra Mahalanobis Mahavidyalaya KOL-108

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

Puja Biswas

SignatureofHOD **Signatureof PRINCIPAL**

Lesson Plan- 2020-21

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- 2020-21

Semester III 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
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	KN KM
		CEMGCOR03T	Chemical Energetics Aromatic Hydrocarbons, Organometallic Compounds, Chemical Equilibrium	Notes Prepared	Assignment	15 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- 2020-21

Semester V Programme Course

Name of the Department: CHEMISTRY

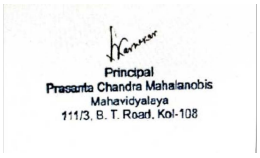
Period	Hons/ Programme Course	Paper Name and Paper Code	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted in hours	Name of the Teacher assigned

August-September	**Programme Course**	CEMGDSE01T	Introduction and history of polymeric materials Functionality Crystallization Glass transition temperature	Notes prepared and E Resources ICT	ClassTest	4 4 4 8	KM KN KM KM
		CEMGDSE01P	Polymer synthesis	Experimental Instructions and Demonstration	Laboratory work	16	KM
		CEMSSEC001	Basic analytical chemistry	Notes prepared and E Resources	ClassTest	6	KM
November -January	**Programme Course**	CEMGDSE01T	Kinetics of Polymerization Determination of molecularweight PolymerSolution Properties of Polymers	Notes prepared and E Resources ICT	ClassTest	8 8 8 10	KM\ KM KN KM
		CEMGDSE01P	Polymer characterization	Experimental Instructions and Demonstration	Laboratory work	16	KM
		CEMSSEC001	Basic analytical chemistry	Notesprepared and EResources ICT	ClassTest	6	KM

Recommended Text books:

1.Billmeyer, F.W. *Textbook of Polymer Science*, 2nd Ed. Wiley Interscience, 1971. Ghosh, P. *Polymer Science & Technology*, Tata McGraw-Hill Education, 1991.

2. Lenz, R.W. *Organic Chemistry of Synthetic High Polymers.* Interscience Publishers, New York, 1967.



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Lesson Plan- 2020-21

Semester II 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:	Offline Notes prepared and E Resources	ClassTest	6 6 7	KM KM KN
		CEMGCOR02P	Viscosity measurement Qualitative semimicro analysis of mixtures	Experimental Instructions and Demonstration	Laboratory work	8 8	KM KN
May-June	Programme Course	CEMGCOR02T	Chemical Kinetics Comparative study of p-block elements:	Offline Notes prepared and E Resources	ClassTest	8 7	KM KN
			Study the kinetics Qualitative semimicro analysis of mixtures	Experimental Instructions and Demonstration	Laboratory work	8 8	KM KN

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 Agency5.Svehla, G. *Vogel's Qualitative Inorganic Analysis*, Pearson Education, 2012.

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Lesson Plan- 2020-21
Semester IV Programme Course Name
of the Department: CHEMISTRY

Period	Hons/ Programme Course	PaperNameand PaperCode	Topics	Methods and materials	Methods of Evaluation	Number of classes allotted inhours	Name of the Teacher assigned
February-April	Programme Course	CEMGCOR04T	Phase Equilibria Conductance Chemical Analysis	Offline Notes prepared and E Resources	ClassTest	8 8 8	KM KM KN
		CEMGCOR04P	Phase equilibria Analytic and Environmental Chemistry	Experimental Instructions and Demonstration	Laboratory work	10 8	KM KN
May-June	Programme Course	CEMGCOR04T	Electromotive force Solutions Chemical Analysis	Offline Notes prepared and E Resources	ClassTest	8 6 8	KM KM KN
		CEMGCOR04P	Conductance Analytic and Environmental Chemistry	Experimental Instructions and Demonstration	Laboratory work	10 8	KM KN

Recommended Text books:

1. Banerjee, S. P. *A Text Book of Analytical Chemistry*, The New Book Stall.
2. Gangopadhyay, P. K. *Application Oriented Chemistry*, Book Syndicate.
3. Palit, S. R., *Elementary Physical Chemistry* Book Syndicate Pvt. Ltd.
4. Pahari, S., *Physical Chemistry* New Central Book Agency
5. Palit, S.R., *Practical Physical Chemistry* Science Book Agency
6. Mukherjee, N.G., *Selected Experiments in Physical Chemistry* J. N. Ghose & Sons

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Lesson Plan- 2020-21
Semester VI Programme Course Name
of the Department: CHEMISTRY

Period	Hons/ Programme Course	PaperName 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	CEMGDSE04T	Chemistry of 3d metalsOrganometallic Compounds Application of Spectroscopy	OfflineNotes prepared and E Resources	ClassTest	6 6 2	KM KM KN
		CEMGDSE04P	Systematic Qualitative Organic Analysis of Organic Compounds	Experimental Instructions and Demonstration	Laboratory work	16	KM
		CEMSSEC001	Basic analytical chemistry	OfflineNotes prepared and E Resources	ClassTest	6	KM
May-June	Programme Course	CEMGDSE04T	Bio-Inorganic Chemistry Active methylene compounds Polynuclear and heteronuclear aromatic compounds Application of Spectroscopy	OfflineNotes prepared and E Resources	ClassTest	6 6 6 2	KM KM KM KN
		CEMGDSE04P	Separation of mixtures by chromatography	Experimental Instructions and Demonstration	Laboratory work	16	KM
		CEMSSEC001	Analysis of food products	OfflineNotes prepared and E Resources	ClassTest and Project	6	KM

Recommended Text books:

1.R.T. Morrison & R.N. Boyd: *Organic Chemistry*, Prentice Hall.

2.Peter Sykes: *A Guide Book to Mechanism* in *Organic Chemistry*, Orient Longman.

3 Arun Bahl and B. S. Bahl: *Advanced Organic Chemistry*, S. Chand

4.Harris, D. C. Quantitative Chemical Analysis, 9th ed. Macmillan Education, 2016.

5. Dean, J. A. Analytical Chemistry Handbook, McGraw Hill, 2004.

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Lesson Plan- 2020-21

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
August-November	**Hons**	**01T**	Hyperbolic functions, higher order derivatives, Leibnitz rule and its applications , 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	Assignment	23	Ms. Piyali Saha
		01T	Reduction formulae, derivations and illustrations of reduction formulae parametric equations, parametrizing a curve, arc length, arc length of parametric curves, area of surface of revolution.	Chalk and Duster, PDF	Assignment	23	Mrs. NehaGhorui (Mundhra

			Techniques of sketching conics.				
		02T	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	Assignment	42	Dr. Trisha Maitra
	Programme Course	**01T**	Limit and Continuity (ε and δ definition), Types of discontinuities, Differentiability of functions, Successive differentiation, Leibnitz's theorem.	Chalk and Duster, PDF	Assignment	6	Ms. Piyali Saha
		01T	Tangents and normals, Curvature, Asymptotes, Singular points, Tracing of curves. Parametric	Chalk and Duster, PDF	Assignment	6	Mrs. NehaGhorui (Mundhra)

			representation of curves and tracing of parametric curves.				
		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	Chalk and Duster, PDF	Assignment	6	Dr. Trisha Maitra
December-January	**Hons.**	**01T**	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.	Chalk and Duster, PDF	Assignment	18	Mrs. NehaGhorui (Mundhra)
		01T	Differential equations and mathematical models. General, particular, explicit, implicit and singular solutions of a differential equation. Exact differential	Chalk and Duster, PDF	Assignment	20	Ms. Piyali Saha

			equations and integrating factors, separable equations and equations reducible to this form, linear equation and Bernoulli equations, special integrating factors and transformations.				
		02T	Equivalence relations and partitions, Functions, Composition of functions, Invertible functions, One to one correspondence and cardinality of 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. Systems of linear equations, row reduction and echelon forms, vector equations, the matrix	Chalk and Duster, PDF	Assignment	42	Dr. Trisha Maitra

			equation Ax=b, solution sets of linear systems, applications of linear systems, linear independence. 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.				
	Programme Course	**01T**	Partial Differential Equations. Euler's theorem on homogeneous functions.	Chalk and Duster, PDF	Assignment	17	Ms. Piyali Saha
		01T	Polar coordinates and tracing of curves in polar coordinates.	Chalk and Duster, PDF	Assignment	15	Mrs. Neha Ghorui (Mundhra)
		01T	Maxima and Minima, Indeterminate forms.	Chalk and Duster, PDF	Assignment	17	Dr. Trisha Maitra

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

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Programme Course:

- H. Anton, I. Birens and S. Davis, Calculus, John Wiley and Sons, Inc., 2002
- G.B. Thomas and R.L. Finney, Calculus, Pearson Education, 2007

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Lesson Plan- 2020-21

Semester III 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
August-November	**Hons**	**05T**	Riemann integration: inequalities of upper and lower sums, Darbaux integration, Darbaux theorem, Riemann conditions of integrability, Riemann sum and definition of Riemann integral through Riemann sums, equivalence of two Definitions.Riemann integrability of monotone and continuous functions, Properties of the Riemann integral; definition and integrability of piecewise continuous and monotone functions. Intermediate Value theorem for Integrals,	Chalk and Duster, PDF	Assignment	45	Ms. Piyali Saha

			Fundamental theorem of Integral Calculus.Improper integrals, Convergence of Beta and Gamma functions.				
		06T	Symmetries of a square, Dihedral groups, definition and examples of groups including permutation groups and quaternion groups (through matrices), elementary properties of groups. Subgroups and examples of subgroups, centralizer, normalizer, center of a group, product of two subgroups. Properties of cyclic groups, classification of subgroups of cyclic groups, Cycle notation for permutations, properties of permutations, even and odd permutations, alternating group, properties of cosets, Lagrange's theorem and consequences including Fermat's Little theorem. External direct product of a finite number of groups, normal subgroups, factor groups, Cauchy's theorem for finite abelian groups.	Chalk and Duster, PDF	Assignment	62	Dr. Trisha Maitra
		7T	Definition and examples of rings, properties of rings, subrings, integral domains and fields, characteristic of a ring. Ideal, ideal generated by a subset of a ring, factor rings,	Chalk and Duster, PDF	Assignment	45	Mrs. Neha Ghorui(Mundhra)

			operations on ideals, prime and maximal ideals. Ring homomorphisms, properties of ring homomorphisms. Isomorphism theorems I, II and III, field of quotients. Vector spaces, subspaces, algebra of subspaces, quotient spaces, linear combination of vectors, linear span, linear independence, basis and dimension, dimension of subspaces.				
		SEC (01M)	Basics of Computer Programming, Fundamentals of Programming, Statements, Arrays, Multi-dimensional arrays	Desktop	Assignment	20	Ms. Piyali Saha
	Programme Course	**(C03T)**	Finite and infinite sets, examples of countable and uncountable sets. Real line, bounded sets, suprema and infima, completeness property of R, Archimedean property of R, intervals. Concept of cluster points and statement of Bolzano-Weierstrass theorem. Real Sequence, Bounded sequence, Cauchy convergence criterion for sequences.	Chalk and Duster, PDF	Assignment	20	Dr. Trisha Maitra
December - January	**Hons**	**5T**	Pointwise and uniform convergence of sequence of functions. Theorems on continuity, derivability and integrability of the	Chalk and Duster, PDF	Assignment	30	Ms. Piyali Saha

			limit function of a sequence of functions. Series of functions, Theorems on the continuity and derivability of the sum function of a series of functions; Cauchy criterion for uniform convergence and Weierstrass M-Test. Fourier series: Definition of Fourier coefficients and series, Reimann Lebesgue lemma, Bessel's inequality, Parseval's identity, Dirichlet's condition. Power series, radius of convergence, Cauchy Hadamard Theorem. Differentiation and integration of power series; Abel's Theorem; Weierstrass Approximation Theorem.				
		06T	Group homomorphisms, properties of homomorphisms, Cayley's theorem, properties of isomorphisms, First, Second and Third isomorphism theorems	Chalk and Duster, PDF	Assignment	15	Dr. Trisha Maitra
		7T	Introduction to linear transformations, Subspaces, dimension of subspaces, null space, range, rank and nullity of a linear transformation, matrix representation of a linear transformation, algebra of linear transformations. Isomorphisms.	Chalk and Duster, PDF	Assignment	30	Mrs. Neha Ghorui (Mundhra)

			Isomorphism theorems, invertibility and isomorphisms, change of coordinate matrix.				
		SEC (01M)	Functions	Desktop	Assignment	8	Ms. Piyali Saha
	Programme Course	**(C03T)**	Cauchy's theorem on limits, order preservation and squeeze theorem, monotone sequences and their convergence (monotone convergence theorem without proof).	Chalk and Duster, PDF	Assignment	8	Dr. Trisha Maitra

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.

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

Prasanta Chandra Mahalanobis Mahavidyalaya

Lesson Plan- 2020-21

Semester V 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
August-November	**Hons**	**COR11T**	Partial Differential Equations – Basic concepts and Definitions. Mathematical Problems. First-Order Equations: Classification, Construction and Geometrical Interpretation. Method of Characteristics for obtaining General Solution of Quasi Linear Equations. Canonical Forms of First-order Linear Equations. Method of Separation of Variables for solving first order partial differential equations. Derivation of Heat equation, Wave equation and Laplace equation. Classification of second order linear equations as hyperbolic, parabolic or elliptic. Reduction of second order Linear Equations	Chalk and Duster, PDF	Assignment	45	Ms. Piyali Saha

			to canonical forms. The Cauchy problem, Cauchy-Kowalewskaya theorem, Cauchy problem of an infinite string, Initial Boundary Value Problems. Semi-Infinite String with a fixed end, Semi-Infinite String with a Free end. Equations with non-homogeneous boundary conditions.				
		COR12T	Automorphism, inner automorphism, automorphism groups, automorphism groups of finite and infinite cyclic groups, applications of factor groups to automorphism groups, Characteristic subgroups, Commutator subgroup and its properties. Properties of external direct products, the group of units modulo n as an external direct product, internal direct products, Fundamental Theorem of finite abelian groups.	Chalk and Duster, PDF	Assignment	45	Dr. Trisha Maitra

			Group actions, stabilizers and kernels, permutation representation associated with a given group action.				
		DSE01T	Introduction to linear programming problem. Theory of simplex method, graphical solution, convex sets, optimality and unboundedness, the simplex algorithm, simplex method in tableau format, introduction to artificial variables, two-phase method. Big-M method and their comparison. Unit 2 : Duality, formulation of the dual problem, primal-dual relationships, economic interpretation of the dual. Transportation problem and its mathematical formulation, northwest-corner method, least cost method and Vogel approximation method for determination of	Chalk and Duster, PDF	Assignment	45	Mrs. Neha Ghorui (Mundra)

			starting basic solution, algorithm for solving transportation problem, assignment problem and its mathematical formulation, Hungarian method for solving assignment problem.				
		DSE03T	Sample space, probability axioms, real random variables (discrete and continuous), cumulative distribution function, probability mass/density functions, mathematical expectation, moments, moment generating function, characteristic function, discrete distributions: uniform, binomial, Poisson, geometric, negative binomial, continuous distributions: uniform, normal, exponential.	Chalk and Duster, PDF	Assignment	23	Mrs. Neha Ghorui (Mundra)
			Joint cumulative distribution function and its	Chalk and Duster, PDF	Assignment	23	Dr. Trisha Maitra

			properties, joint probability density functions, marginal and conditional distributions, expectation of function of two random variables, conditional expectations, independent random variables, bivariate normal distribution, correlation coefficient, joint moment generating function (jmgf) and calculation of covariance (from jmgf), linear regression for two variables				
	Programme Course	**DSE (01T)**	R, R2, R3 as vector spaces over R. Standard basis for each of them. Concept of Linear Independence and examples of different bases. Subspaces of R2, R3. Translation, Dilation, Rotation, Reflection in a point, line and plane. Matrix form of basic geometric transformations.	Chalk and board, Pdf for reference	Assignment	20	Dr. Trisha Maitra

December-January	**Hons**	**COR11T**	Non-Homogeneous Wave Equation. Method of separation of variables, Solving the Vibrating String Problem. Solving the Heat Conduction problem Unit 4: Central force. Constrained motion, varying mass, tangent and normal components of acceleration, modelling ballistics and planetary motion, Kepler's second law.	Chalk and Duster, PDF	Assignment	15	Ms. Piyali Saha
		COR12T	Applications of group actions. Generalized Cayley's theorem. Index theorem. Groups acting on themselves by conjugation, class equation and consequences, conjugacy in Sn, p-groups, Sylow's theorems and consequences, Cauchy's theorem, Simplicity of An for $n \geq 5$, non-simplicity tests.	Chalk and Duster, PDF	Assignment	15	Dr. Trisha Maitra
		DSE01T	Game theory: Formulation of two person zero sum games,	Chalk and Duster, PDF	Assignment	15	Mrs. Neha Ghorui (Mundra)

			solving two person zero sum games, games with mixed strategies, graphical solution procedure, linear programming solution of games.				
		DSE03T	Chebyshev's inequality, statement and interpretation of (weak) law of large numbers and strong law of large numbers. Central Limit theorem for independent and identically distributed random variables with finite variance, Markov Chains, Chapman-Kolmogorov equations, classification of states.	Chalk and Duster, PDF	Assignment	7	Mrs. Neha Ghorui (Mundra)
			Random Samples, Sampling Distributions, Estimation of parameters, Testing of hypothesis.	Chalk and Duster, PDF	Assignment	7	Dr. Trisha Maitra
	Programme Course	**DSE (01T)**	Interpretation of eigen values and eigen vectors for such transformations and eigen spaces as invariant subspaces.	Chalk and board, Pdf for reference	Assignment	8	Dr. Trisha Maitra

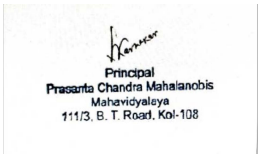
Recommended Text books:

Hons:

- S.L. Ross, Differential Equations, 3rd Ed., John Wiley and Sons.
- Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali, Linear Programming and Network Flows, 2nd Ed., John Wiley and Sons.
- A. Gupta, Ground work of Mathematical Probability and Statistics, Academic publishers.
- M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011.
- Joseph A. Gallian, Contemporary Abstract Algebra, 4th Ed., 1999.
- David S. Dummit and Richard M. Foote, Abstract Algebra, 3rd Ed., John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2004.
- I.N. Herstein, Topics in Algebra, Wiley Eastern Limited, India, 1975.

Programme Course:

- S. K. Mapa, Higher Algebra: Abstract and Linear
- P.R. Halmos, Naive Set Theory, Springer, 1974



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Lesson Plan- 2020-21

Semester II Honours. & 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
March-April	**Hons.**	**03T**	Review of Algebraic and order properties of R, e-neighborhood, countable sets, Uncountable sets, Bounded above sets, Bounded below sets, Unbounded sets, Supremum, Infimum, Completeness Property of R and it's Properties.	Chalk and Duster, PDF	Assignment	18	Mrs. NehaGhorui (Mundhra)
		03T	Sequences, Bounded and Convergent Sequence, limit of a sequence, lim inf, lim sup, limit theorems, Monotone Sequences, Monotone Convergent Theorem. Subsequences, Divergence criteria. Monotone Subsequent Theorem, Bolzano Weierstrass theorem for	Chalk and Duster, PDF	Assignment	20	Ms. Piyali Saha

			sequences, Cauchy sequence, Cauchy's Convergence Criterion, Infinite series its Convergence and Divergence. Cauchy Criterion.				
		04T	Lipschitz condition & Picard's theorem. General solution of homogeneous equation of second order, Homogeneous equation. Wronskian properties and applications. Linear Homogeneous, non-Homogeneous Equations of Higher Order with Constant Coefficients. Euler's Equation, Method of Undetermined Coefficients, Method of Variation of Parameters, System of linear Differential Equation, Types of Linear Systems, Differential Operators, an Operator Method for Linear Systems with Constant Coefficients: Two equations in two unknown functions	Chalk and Duster, PDF	Assignment	20	Dr. Trisha Maitra

		04T	Triple product, Introduction to vector functions, operations with vector valued functions.	Chalk and Duster, PDF	Assignment	15	Mrs. NehaGhorui (Mundhra)
	Programme Course	**02T**	First Order differential Equations, Integrating Factors, rules to find an integrating factor, First Order higher degree equations sovable for x, y, p. Methods for solving higher-order differential equations.	Chalk and Duster, PDF	Assignment	17	Mrs. NehaGhorui(Mundhra)
		02T	Linear Homogeneous Equations with Constant Coefficients, Linear non-homogeneous equations. The method of variation of parameters. Cauchy- Euler equations	Chalk and Duster, PDF	Assignment	17	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 differential equations, Linear partial differential equation of first order	Chalk and Duster, PDF	Assignment	17	Ms. Piyali Saha

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May-June	**Hons.**	**03T**	Archimedian property, Density of Rational and Irrational Numbers in R, Intervals, Limit points of a set, Isolated point, Open set, Closed set, Derived set, Bolzano Weirstrass Theorem, Compact sets inR, Heine Borel Theorem.	Chalk and Duster, PDF	Assignment	22	Mrs. NehaGhorui(Mundhra)
		03T	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	15	Ms. Piyali Saha
		04T	Equillibrium 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	20	Dr. Trisha Maitra
		04T	Limits and continuity of a vector valued function, differentiation and integration of vector function	Chalk and Duster, PDF	Assignment	20	Mrs. NehaGhorui(Mundhra)
	Programme Course	**02T**	Basic theory of Linear Differential Equations,	Chalk and Duster, PDF	Assignment	8	Mrs. NehaGhorui(Mundhra)

			Wronskian and it's properties.				
		02T	Simultaneous Differential Equations, Total Differential Equations	Chalk and Duster, PDF	Assignment	8	Dr. Trisha Maitra
		02T	Lagrange's & Charpit's Method. Classification of second order partial differential equations into elliptic, parabolic and hyperbolic.	Chalk and Duster, PDF	Assignment	8	Ms. Piyali Saha

Recommended Text books:

- S. K. Mapa, Real Analysis
- Tom M. Apostol, Mathematical Analysis, Narosa Publishing House
- W. Rudin, Principles of Mathematical Analysis, Tata McGraw- Hill
- Murray, D., Introductory Course in Differential Equations, Longmans Green and Co.
- Maity, K. C. and Ghosh, R.K., Vector Analysis, New Central Book Agency (P) Ltd. Kolkata (India)
- S. L. Ross, Differential Equations, 3rd Ed., John Wiley and Sons, India 2004

Programme Course:

- Shepley L. Ross, Differential Equations, 3rd Ed., John Wiley and Sons, 1984.
- Differential Calculus, B. C. Das and B. N. Mukherjee

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Lesson Plan- 2020-21

Semester IV Honours & 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
March-April	**Hons**	**08T**	Riemann integration: inequalities of upper and lower sums, Darbaux integration, Darbaux theorem, Riemann conditions of integrability, Riemann sum and definition of Riemann integral through Riemann sums, equivalence of two Definitions.Riemann integrability of monotone and continuous functions, Properties of the Riemann integral; definition and integrability of piecewise continuous and monotone functions. Intermediate Value theorem for Integrals, Fundamental theorem of Integral Calculus.Improper integrals, Convergence of Beta and Gamma functions.	Chalk and Duster, PDF	Assignment	45	Ms. Piyali Saha
		09T	Functions of several variables, limit and continuity of functions of two or more variables Partial differentiation, total differentiability and differentiability, sufficient condition for differentiability. Chain rule for one and two independent parameters, directional	Chalk and Duster, PDF	Assignment	45	Mrs. Neha Ghorui(Mundhra)

			derivatives, the gradient, maximal and normal property of gradient, tangent planes, Extrema of functions of two variables, method of Lagrange multipliers, constrained optimization problems.				
		10T	Definition and examples of rings, properties of rings, subrings, integral domains and fields, characteristic of a ring. Ideal, ideal generated by a subset of a ring, factor rings, operations on ideals, prime and maximal ideals. Ring homomorphisms, properties of ring homomorphisms. Isomorphism theorems I, II and III, field of quotients. Vector spaces, subspaces, algebra of subspaces, quotient spaces, linear combination of vectors, linear span, linear independence, basis and dimension, dimension of subspaces.	Chalk and Duster, PDF	Assignment	45	Dr. Trisha Maitra
		SEC (02M)	Introduction, propositions, truth table, negation, conjunction and disjunction. Implications, biconditional propositions, converse, contra positive and inverse propositions and precedence of logical operators. Propositional equivalence: Logical equivalences.	Chalk and Duster, PDF	Assignment	15	Ms. Piyali Saha

			Predicates and quantifiers: Introduction, Quantifiers, Binding variables and Negations				
	Programme Course	**(C04T)**	Equivalence relations and partitions, Functions, Composition of functions, Invertible functions, One to one correspondence and cardinality of a set. Definition and examples of groups, examples of abelian and non-abelian groups, the group Zn of integers under addition modulo n and the group U(n) of units under multiplication modulo n.Cyclic groups from number systems, complex roots of unity, circle group, the general linear group GLn(n,R), groups of symmetries of (i) an isosceles triangle, (ii) an equilateral triangle,(iii) a rectangle, and (iv) a square, the permutation group Sym (n), Group of quaternions. Subgroups, cyclic subgroups, the concept of a subgroup generated by a subset and the commutator subgroup of group, examples of subgroups including the center of a group. Cosets, Index of subgroup, Lagrange's theorem, order of an element, Normal subgroups:	Chalk and Duster, PDF	Assignment	42	Dr. Trisha Maitra & Mrs. Neha Ghorui (Mundhra)

			their definition, examples, and characterizations, Quotient groups.				
May-June	**Hons**	**08T**	Pointwise and uniform convergence of sequence of functions. Theorems on continuity, derivability and integrability of the limit function of a sequence of functions. Series of functions, Theorems on the continuity and derivability of the sum function of a series of functions; Cauchy criterion for uniform convergence and Weierstrass M-Test. Fourier series: Definition of Fourier coefficients and series, Reimann Lebesgue lemma, Bessel's inequality, Parseval's identity, Dirichlet's condition. Power series, radius of convergence, Cauchy Hadamard Theorem. Differentiation and integration of power series; Abel's Theorem; Weierstrass Approximation Theorem.	Chalk and Duster, PDF	Assignment	30	Ms. Piyali Saha
		09T	Double integration over rectangular region, double integration over non-rectangular region, Double integrals in polar co-ordinates, Triple integrals, Triple integral over a parallelepiped and solid regions. Volume by triple integrals, cylindrical and	Chalk and Duster, PDF	Assignment	30	Mrs. Neha Ghorui (Mundhra)

			spherical coordinates. Change of variables in double integrals and triple integrals.Definition of vector field, divergence and curl. Line integrals, Applications of line integrals: Mass and Work. Fundamental theorem for line integrals, conservative vector fields, independence of path.Green's theorem, surface integrals, integrals over parametrically defined surfaces. Stoke's theorem, The Divergence theorem.				
		10T	Introduction to linear transformations, Subspaces, dimension of subspaces, null space, range, rank and nullity of a linear transformation, matrix representation of a linear transformation, algebra of linear transformations. Isomorphisms. Isomorphism theorems, invertibility and isomorphisms, change of coordinate matrix.	Chalk and Duster, PDF	Assignment	30	Dr. Trisha Maitra
		SEC (02M)	Sets, subsets, Set operations and the laws of set theory and Venn diagrams. Examples of finite and infinite sets. Finite sets and counting principle. Empty set, properties of empty set. Standard set operations. Classes of	Chalk and Duster, PDF	Assignment	10	Ms. Piyali Saha

			sets. Power set of a set.Difference and Symmetric difference of two sets. Set identities, Generalized union and intersections. Relation: Product set. Composition of relations, Types of relations, Partitions, Equivalence Relations with example of congruence modulo relation. Partial ordering relations, n-ary relations.				
	Programme Course	**(C04T)**	Definition and examples of rings, examples of commutative and non-commutative rings: rings from number systems, Zn the ring of integers modulo n, ring of real quaternions, rings of matrices, polynomial rings, and rings of continuous functions. Subrings and ideals, Integral domains and fields, examples of fields: Zp, Q, R, and C. Field of rational functions.	Chalk and Duster, PDF	Assignment	33	Dr. Trisha Maitra & Mrs. Neha Ghorui (Mundhra)

Recommended Text books:

Hons:

1. K.A. Ross, Elementary Analysis, The Theory of Calculus, Undergraduate Texts in Mathematics, Springer

2. R.G. Bartle and D.R. Sherbert, Introduction to Real Analysis, 3rd Ed., John Wiley and Sons (Asia) Pvt.

3. G.B. Thomas and R.L. Finney, Calculus, 9th Ed., Pearson Education, Delhi, 2005.

4. M.J. Strauss, G.L. Bradley and K. J. Smith, Calculus, 3rd Ed., Dorling Kindersley (India) Pvt. Ltd.

5. M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011.

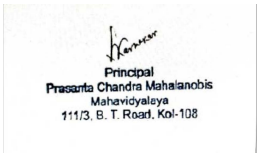
6. Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence, Linear Algebra, 4th Ed., Prentice- Hall of India

Programme Course:

1.M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011.

2. Joseph A Gallian, Contemporary Abstract Algebra, 4th Ed., Narosa, 1999.

3. George E Andrews, Number Theory, Hindustan Publishing Corporation, 1984



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Lesson Plan- 2020-21

Semester VI Honours & 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
February-April	**Hons**	**13T**	Definition and example of Metric Space, open and closed set, dense set, separable space, Complete Metric space, Cantor's theorem Continuity, Connectedness, Compactness, Homeomorphism Limit, continuity and	Chalk and board, Pdf for reference	Assignment, Presentation	55	Ms. Piyali Saha

			differentiability of complex variable				
		14T	Polynomial rings, PID, UFD, ED Dual space, dual basis, Eigen space of Linear operator	Chalk and board, Pdf for reference	Assignment, Presentation	55	Dr. Trisha Maitra
		DSE (04T)	General properties of polynomials, General properties of equation, Descarte's rule of signs Cardon's method, Ferrari's method	Chalk and board, Pdf for reference	Assignment, Presentation	55	Mrs. NehaGhorui(Mundhra)
		DSE (05T)	Basic properties of ordered sets, duality principle, lattice, sublattice, products, homomorphism Distributive lattice, Boolean algebras, Boolean polynomials, Quinn-McClusey method, Karnaugh diagrams, Logic Gates, Switching circuits Alphabet, Srings, Languages, Finite Automata and Regular Languages	Chalk and board, Pdf for reference	Assignment, Presentation	55	Ms. PiyaliSaha and Dr. Trisha Maitra
	Programme Course	**DSE (04T)**	Linear Programing Problem, Graphical approach, Simplex Method,	Chalk and board, Pdf for reference	Assignment	55	Mrs. Neha Ghorui(Mundhra)

			two-phase method, Big-M method				
		SEC (02M)	Proposition, truth table, conjunction and disjunction, logical operators, Propositional equivalence Set operations and Venn diagrams, Counting principles, Classes of sets	Chalk and board, Pdf for reference	Assignment	20	Ms. PiyaliSaha
May-June	**Hons**	**13T**	Analytic function, Contour Integration, Liouville's Theorem, Laurent Series	Chalk and board, Pdf for reference	Assignment, Presentation	35	Ms. PiyaliSaha
		14T	Inner product space, Gramm-Schmidt orthogonalisation, Normal and self adjoint operators, Orthogonal projection	Chalk and board, Pdf for reference	Assignment, Presentation	35	Dr. Trisha Maitra
		DSE (04T)	Symmetric functions of roots, Newton's theorem Separation of the roots of equations, Strum's theorem, Solution of numerical equations	Chalk and board, Pdf for reference	Assignment, Presentation	35	Mrs. Neha Ghorui(Mundhra)
		DSE (05T)	Context Free Grammers and Pushdown Automata	Chalk and board, Pdf for reference	Assignment, Presentation	35	Ms. Piyali Saha and Dr. Trisha Maitra

			Turing Machines Undecidability				
	Programme Course	**DSE (04T)**	Duality, primal-dual relationship, sensitivity analysis	Chalk and board, Pdf for reference	Assignment	35	Mrs. Neha Ghorui(Mundhra)
		SEC (02M)	Difference and Symmetric difference of sets, Product set, Composition of relations, equivalence relations, Partial order relations	Chalk and board, Pdf for reference	Assignment	15	Ms. Piyali Saha

Recommended Text books:

Hons:

- S. Kumarsean, Topology of Metric Space, 2nd Ed, Narosa Publishing House,2011
- S. Ponnusamy, Foundations of omplex Analysis, Alpha Science International, 2005.
- M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011.
- Joseph A. Gallian, Contemporary Abstract Algebra, 4th Ed., Narosa Publishing House, 1999.
- C. C. MacDuffee, Theory of Equations, John Wiley & Sons Inc., 1954.
- S. K. Mapa, Classical Algebra
- B A. Davey and H. A. Priestley, Introduction to Lattices and Order, Cambridge University Press,
  Cambridge, 1990.
- J.A. Anderson, Automata Theory with Modern Applications, Cambridge University Press, 2006.
- Rudolf Lidl and Günter Pilz, Applied Abstract Algebra, 2nd Ed., Undergraduate Texts in Mathematics,Springer (SIE), Indian reprint, 2004.
- Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory, (2nd Ed.),Pearson Education (Singapore) P.Ltd., Indian Reprint 2003.

Programme Course:

- S. K. Mapa, Higher Algebra: Abstract and Linear
- P.R. Halmos, Naive Set Theory, Springer, 1974

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Lesson Plan- 2020-21

Semester I Programme Course

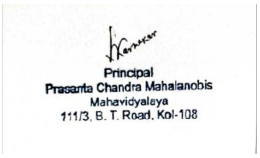
Name of the Department: Physics

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**	Mechanics PHSGCOR01T	1. Mathematical Methods 2. Particle Dynamics 3. Oscillations	Online Notes prepared and E Resources	Assignment and class test	12 12 12	AH SS AN
		Mechanics Lab PHSGCOR01P	1. Young's modulus 2. Rigidity modulus 3. Determination of g	Experimental instructions and Demonstration	Laboratory Work	12	Principal AH Principal
December - January	**Programme Course**	Mechanics PHSGCOR01T	2. Particle Dynamics 3. Oscillations 4. Gravitation 5. Elasticity 6. Special Theory of Relativity	Online Notes prepared and E Resources	Assignment and class test	12 12 24	SS AN AH
		Mechanics Lab PHSGCOR01P	4. Moment of inertia 5. Spring constants	Experimental instructions and Demonstration	Laboratory Work	12	AH Principal

Recommended Text books:

1. Theoretical Mechanics - MR Spiegel.

2. Classical Mechanics & General Properties of Matter - SN Maity and DP Raychowdhury.
3. Feynman Lecture vol I.
4. A text book of practical physics - Prakash & Ramakrishna.
5. Advance practical physics - Flint & Worsnop.



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Lesson Plan- 2020-2021

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	**Hons.**	**CMSACOR01T** **CMSACOR01P**	1.Introduction to C and C++ 2.Data types, variables, constants, operators and Basic I/O 3. Expressions, Conditional Statements and Iterative Statements 4. Functions and Arrays 5. Derived Data Types (Structures and Unions)	Online Google meet Google classroom	Online class test Internal	30 30	DC IT1
		CMSACOR02T **CMSACOR02P**	1.Introduction 2. Data Representation and Basic Computer Arithmetic 3. Basic Computer Organization and Design	Online Google meet Google classroom	Online class test Internal	30 30	SD SS
September-November	**Programme Course**	**CMSGCOR01T** **CMSGCOR01P**	Computer Fundamentals Planning the Computer	Online Google meet Google classroom	Online class test Internal	30 30	SD SS

			Program Techniques of problem Solving Overview of Programming Introduction to Python				
December-January	**Hons.**	**CMSACOR01T CMSACOR01P**	6. Pointers and References in C++ 7. Memory Allocation in C++ 8. File I/O, Preprocessor Directives 9. Using Classes in C++ 10. Overview of Function Overloading and Operator Overloading 11. Inheritance, Polymorphism and Exception Handling	Online Google meet Google classroom	Online class test Internal	30 30	SS DC
		CMSACOR02T CMSACOR02P	4. Central Processing Unit 5. Memory Organization 6. Input-output Organization	Online Google meet Google classroom	Online class test Internal	30 30	SD SS
December-january	**Programme Course**	**CMSGCOR01T CMSGCOR01P**	Creating Python Programs Structures Introduction to Advanced Python	Online Google meet Google classroom	Online class test Internal	30 30	SD SS

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Recommended Text books:

1. E Balaguruswamy , " Object Oriented Programming with C++", Tata McGraw-Hill Education, 2008.
2. M. Mano, Computer System Architecture, Pearson Education, 1992
3. T. Budd, Exploring Python, TM H, 1st Ed, 2011

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Lesson Plan- 2020-21

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	Online Google meet Google classroom	Online class test Internal	30	SD SS
November-january	**Programme Course**	CMSGCOR03T CMSGCOR03P	Scheduling Memory Management	Online Google meet Google classroom	Online 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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Semester V 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**	CMSGDSE01T	Introduction to Java Object oriented programming concept Java programming Fundamental Classes and objects Arrays and Strings	Online Google meet Google classroom	Online class test Internal	30	SD SS
November- January	**Programme Course**	CMSGDSE01T	Abstract Class, Interface and Packages Exception Handling File Handling Applet Programming	Online Google meet Google classroom	Online class test Internal	30	SD SS

Recommended Text books:

1. Herbert Schildt, Java 7, The Complete Reference, 8th Edition, 2009

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Semester II Honours. Course

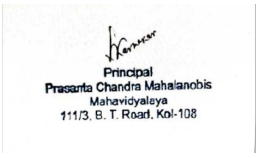
Name of the Department: Computer Science

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	**Hons.**	**CMSACOR03T**	1. Introduction to Java 2. Arrays, Strings and I/O 3. Object-oriented Programming Overview 4. Inheritance, Interfaces, Packages, Enumerations, Auto boxing and Metadata	Online Google meet Google classroom	Online class test Internal	30	SS DC
		CMSACOR03P	Programming	Online Google meet Google classroom	Online class test Internal	30	SS DC
		CMSACOR04T	1. Discrete Structures- Introduction 2. Growth of Functions 3. Recurrences	Online Google meet Google classroom	Online class test Internal	30	SD
March-April	**Programme Course**	**CMSGCOR02T CMSGCOR02P**	1. Introduction to DBMS 2. ERD 3. Relational Data Model	Online Google meet Google classroom	Online class test Internal	30	SD SS
May-June	**Hons.**	**CMSACOR03T**	1. Exception Handling, Threading, Networking and Database	Online Google meet Google classroom	Online class test Internal	30	SS DC

			Connectivity 2. Applets and Event Handling				
		CMSACOR03P	Programming	Online Google meet Google classroom	Online class test Internal	30	SS DC
		CMSACOR04T	1. Graph Theory 2. Propositional Logic	Online Google meet Google classroom	Online class test Internal	30	SD
	Programme Course	**CMSGCOR02T CMSGCOR02P**	4. Database design	Online Google meet Google classroom	Online class test Internal	30	SD SS

Recommended Text books:

1. **E. Balaguruswamy, "Programming with Java", 4th Edition, Mcgraw Hill. 2009**
2. **Keneth Rosen, Discrete Mathematics and its Applications, Sixth Edition, McGraw Hill 2006**
3. **R. Elmasri, S.B. Navathe, Fundamentals of Database Systems 6th Edition, Pearson Education, 2010.**



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Lesson Plan- 2021

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	Online Google meet Google classroom	Online class test Internal	30	SD DC
		CMSGCOR04P	Programming	Online Google meet Google classroom	Online class test Internal	30	SS
May-June	**Programme Course**	**CMSGCOR04T**	Programming the Basic Computer, Input-output Organization	Online Google meet Google classroom	Online class test Internal	30	SD DC
		CMSGCOR04P	Programming	Online Google meet Google classroom	Online class test Internal	30	SS

Recommended Text books:

1. Morris Mano, Computer System Architecture, Pearson Education 1992

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Semester VI 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
February-April	**Programme Course**	**CMSGDSE04T**	Basic Concepts, Physical Layer, Data link Layer, Network Layer	Online Google meet Google classroom	Online class test Internal	30	SD SS DC
May-June	**Programme Course**	**CMSGDSE04T**	Transport Layer, Application Layer, Network Security	Online Google meet Google classroom	Online class test Internal	30	SD SS DC

Recommended Text books:

1. B.A.Forouzan: Data Communication and Networking, 4th Edition, Tata McGraw Hill,2007

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