Prasanta Chandra Mahalanobis Mahavidyalaya

Lesson Plan- 2021-22

Semester II 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
March-April	**Hons.**	**03T CMSACOR03T**	Introduction to Java Arrays, Strings and I/O	offline	Internal Assesment	30	SS
		04T CMSACOR04T	Graph Theory Sets	offline	Internal Assesment	30	SD
	Programme Course	CMSGCOR02T	Introduction to DBMS Entity Relationship Modelling Relational Data Model	offline	Internal Assesment	20 20	SD DC
		CMSGCOR02P		offline	Internal Assesment	30	SD
May-June	**Hons.**	**03T CMSACOR03T**	Object-oriented Programming Inheritance Exception Handling	offline	Internal Assesment	20	SS
		04T CMSACOR04T	Growth of Functions Recurrences	offline	Internal Assesment	20	SD
	Programme Course	**CMSGCOR02T**	Database Design	offline	Internal Assesment	20 10	SD DC
		CMSGCOR02P		offline	Internal Assesment	20	SD

Recommended Text books:

1. **Kenneth Rosen, Discrete Mathematics and its Applications**
2. **R. Elmasri, S.B. Navathe, Fundamentals of Database Systems**

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Lesson Plan- 2021-22

Semester IV Hons. & 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	**Hons**	**08T CMSACOR08T**	Algorithm Design Techniques Sorting and Searching Techniques	offline	Internal Assesment	60	SS
		09T CMSACOR09T	ProcessModels Requirement Analysis Software Project Management	offline	Internal Assesment	60	DC
		10T CMSACOR10T	Entity Relationship Modelling Relation Data Model	Offline	Internal Assesment	60	SD
		SEC CMSSSEC02M	R Programming	Offline	Internal Assesment	15	SD
	Programme Course	CMSGCOR04T	Data Representation and basic Computer Arithmetic Central Processing Unit	Offline	Internal Assesment	30 10	SD DC
May-June	**Hons**	**08T** CMSACOR08T	Decision Trees Graphs	Offline	Internal Assesment	30	SS
		09T CMSACOR09T	Quality Management Design Engineering Testing Strategies & Tactics	Offline	Internal Assesment	30	DC
		10T CMSACOR10T	Database Design File Structure and Indexing	Offline	Internal Assesment	30	SD

		SEC CMSSSEC02M	R Programming	Offline	Internal Assesment	15	SD
	Programme Course	CMSGCOR04T	Basic Computer Organization Programming the Basic Computer	Offline	Internal Assesment	30 20	SD DC

Recommended Text books:

1. **T.H. Cormen, Charles E. Leiserso, Ronald L. Rivest, Clifford Stein Introduction to Algorithms**
2. **R. Mall, Fundamentals of Software Engineering**
3. **R. Elmasri, S.B. Navathe, Fundamentals of Database Systems**
4. **M. Mano, Computer System Architecture**

Prasanta Chandra MahalanobisMahavidyalaya

Lesson Plan- 2021-22

Semester V/ 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**	CMSGDSE04	Basic Concepts Physical Layer Datalink Layer	Offline	Internal Assesment	30	SD
May-June	**Programme Course**	**CMSGDSE04**	Network Layer Transport Layer Application Layer	Offline	Internal Assesment	30	SD

Recommended Text books:

B.A. Forouzan: Data Communication and Networking

Prasanta Chandra Mahalanobis Mahavidyalaya

Lesson Plan- 2021-22

Semester I/II Honors. & 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
March-April	**Programme Course 2**	**PHSGCOR02T**	1. Vector algebra : dot product, cross product, gradient, curl, divergence 2. Electrostatics: Coulomb's law electric field, flux, potential, Gauss law, it's application, dipole 3. Magnetostatics: Ampere's circuital law and it's application, Biosavart law and it's application.	Online: Google meet, Offline Notes prepared and E Resources	Assignment & Class test	8 8 8 8 8	AH AN SS Principal PS
		PHSGCOR02P	1. To verify the Thevenin and Norton theorems. 2. To verify the superposition and maximum power transfer theorm .	Experimental instructions and Demonstration	Laboratory Work	8	AH
May - June	**Programme Course**	**PHSGCOR02T**	1. Vector Integral: line, surface, volume internal, Gauss divergence theorem, Stocks theorm. 2. Electromagnetic therory: Maxwell equation, equation of continuity, displacement current, poynting vector. 3. Liner network theory & Electromagnetic induction: Faraday'd law, Lentz law, self inductance,	Online: Google meet, Offline Notes prepared and E Resources	Assignment & Class test	8 8 8 8 8	AH AN SS Principal PS

			combination of LCR, Thevenin-Norton theorem.				
		PHSGCOR02P	3. To study responce curve of a series and parallel LCR circuit. 4. To study the characteristics of a RC circuit.	Experimental instructions and Demonstration	Laboratory Work	8	AH

Recommended Text books:

1. **Classical electromagnetism - J Franklin.**
2. **Electricity, Magnetism and Electromagnetic theory - Mahajan & Choudhury.**
3. **Introduction to Electrodynamic - Griffiths.**
4. **Feynman lecture volume 2.**
5. **A text book of practical physics - Prakash & Ramakrishna.**
6. **Advance practical physics - Flint & Worsnop.**

Prasanta Chandra MahalanobisMahavidyalaya
Lesson Plan- 2021-22
Semester I/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 Agency

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

Prasanta Chandra MahalanobisMahavidyalaya
Lesson Plan- 2021-22
Semester III/ 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

Prasanta Chandra MahalanobisMahavidyalaya
Lesson Plan- 2021-22
Semester V/ 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.

Prasanta Chandra Mahalanobis Mahavidyalaya

Lesson Plan (2021-22)

GEOGRAPHY HONOURS/ PROGRAMME COURSE

SEMESTER II HONS

Lesson No.	Topic	Content	Methods and materials	Assessment	Number of Class Allotted in hours	Name of the Teacher
1. (March-May)	GEOACOR03T Human Geography	1.Nature, scope of Human Geography, Environmental Approaches 2.Evolution of human societies 3. Human adaptation to environment: Masai 4. Population growth and distribution, 5. Demographic transition	PPT Presentation, Black Board Teaching& Audio-Visual Mode of Teaching	CLASS TEST #1	60	AR , SR
2 (March-May)	GEOACOR04T Cartograms & Thematic mapping	6.Scientific notation, logarithm and anti-logarithm, natural and log scales 7.Diagrammatic representation of data: Line, Bar, Isopleths 8.Representation of socio-economic data: Bearing: Magnetic and true, whole-circle and reduced 9.Survey equipment: Prismatic Compass, Dumpy and Theodolite	Field Survey & Black Board Teaching	CLASS TEST #1	40	SC, RB
3. (March-May)	GEOACOR 04P Cartograms & Thematic Mapping Lab	10.Traverse survey using prismatic compass 11. Profile survey using dumpy Level 12. Choropleth 13.Dots and Spheres diagram	Field Survey	CLASS TEST #1	35	SC & RB

4. (May-June)	GEOACOR 03T Human Geography	1.Concept and classification of race 2.Cultural regions (language and religion) 3.Types and patterns of rural settlements 4. Morphology of urban settlements		CLASS TEST #2	30	SR, AR
5. (May-June)	GEOACOR 04T Cartograms & Thematic mapping	5.Representation of socio-economic data: 6.Bearing: Magnetic and true, whole-circle and reduced	Field Survey & Black Board Teaching	CLASS TEST #2	20	SC, RB
6. (May-June)	GEOACOR 04P Cartograms & Thematic Mapping Lab	7.Proportional pie-diagrams representing economic data and land use data 8. Traverse survey using prismatic compass 9. Profile survey using dumpy Level	Field Survey & Black Board Teaching	CLASS TEST #2	25	SC & RB
					210 HOURS/CLASSES	

Recommended Text Book:

Gould, W.T.S. 2015.Population and Development, Routledge.

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

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

Gould, W.T.S. 2015.Population and Development, Routledge.

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.

Semester II General & 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-April	**General**	**Unit I Population and Social Geography**	1.Factors of Growth and distribution of world population. Demographic Transition Theory	PPT Presentation Black board teaching and	Regular assessment in classes	10	SR, RC
		Unit II Economic and Settlement Geography	6.Sectorsoftheeconomy:primary,secondary,tertiary andquaternary 7. Typesofagriculture:Intensive subsistence rice farming,Plantationagriculture(Tea andCoffee)	PPT Presentation		20	SR,SC
		Unit I Population and Social Geography	World Population Composition: Age, Gender and Literacy. 3. Migration: Types, causes andconsequences. 4. Space and Society: Cultural Regions; Race; Religion and Language	Black board teaching and		15	SR, KP

May-June		**Unit II Economic and Settlement Geography**	8. Location,problems and prospectsofIndianindustries—Cottontextile,Petroleumrefining, Locomotive 9. Types and Patterns of Rural Settlements 10. Classification of Urban Settlements; Trends and Patterns of World Urbanization	PPT Presentation	ClassTest 1 Class Test 2	20	SC,RC
		Unit I Population and Social Geography	5. Contemporary social issues: Illiteracy and Poverty	Black board teaching and		15	SR, KP

REFERENCES:

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 HONS

Lesson No.	Topic	Content	Methods and materials	Assessment	Number of Class Allotted in hours	Name of the Teacher
1. (February-April	GEOACOR08T Regional Planning & Development	1. Concept of regions: Types of regions and their delineation Regional Planning: Types, principles, objectives 2.Concepts of growth and development 3Indicators of development: 4.Human development: Concept	PPT Presentation, Black Board Teaching& Audio-Visual Mode of Teaching	CLASS TEST #1	65	RB & SR
2 (February-April)	**GEOACOR09T Economic Geography**	**1.** Concepts in Economic Geography: 2.Concept of economic man 3.Economic distance and transport costs	ICT MODE OF TEACHING	**CLASS TEST #1**	60	**SC, RB**
3. (February-April)	**GEOACOR10T Environmental Geography**	4.Waste management 5.Environmental policies – National Environmental Policy, 2006, Earth Summits (Stockholm, Rio, Johannesburg) 6. Global initiatives for	ICT MODE OF TEACHING	**CLASS TEST #1**	40	**AR & SR**

		environmental management				
4.(February-April)	GEOSSEC02M	Advanced Spatial Statistical Techniques	Computer Lab	Project Submission	15	
5.(May-June)	GEOACOR08T Regional Planning & Development	7.Multi-level planning in India 8.Cumulative causation model for regional development (Myrdal) 9.Concept and causes of underdevelopment 10. Regional development in India: 11.Disparity and diversity	PPT Presentation, Black Board Teaching	CLASS TEST #2	30	SR & AR
6. (May-June)	GEOACOR09T Economic Geography	12.Concept and classification of economic activities 13.Factors affecting location of economic activity with special reference to industry (Weber). 14.Secondary activities: Concept of manufacturing regions, special economic zones and technology parks 4.Tertiary activities: Transport and services 5.Agricultural systems: tea plantation in India	Black Board Teaching	CLASS TEST #2	30	SC, RB

		and mixed farming in Europe 6.International trade and economic blocs: WTO, GATT and BRICS: Evolution, structure and functions				
7. (May-June)	GEOACOR10T Environmental Geography	1.Concept of holistic environment and systems approach 2. Ecosystem: Concept, structure and functions	Field Survey, PPT Presentation,	CLASS TEST #2	20	SR&AR
8.(May-June)	GEOACOR10P Environmental Geography	1.Preparation of questionnaire 2.Preparation of check-list for Environmental Impact	Field Survey and PPT Presentation, ICT classes	CLASS TEST 1 & 2	20	AR &RB
9.(May-June)	GEOSSEC02M	Advanced Spatial Statistical Techniques	Computer Lab	Project Submission	20	AR & RB
TOTAL					300 HOURS/ CLASSES	

REFERENCES:

1. Misra, R.P. 1992. Regional Planning: Concepts, Techniques , Policies and Case Studies, Concept Publishing.
2. Willington D. E., 2008: Economic Geography, Husband Press.
3. Wood, A., Roberts, A. 2010. Economic Geography: Places, Networks and Flows, Routledge.
4. Sharma, P.D. 2011. Ecology and Environment, Rastogi Publications.
5. Singh, S. 2013. Environmental Geography, PrayagPustakBhawan.
6. Miller, G.T. 2004. Environmental Science: Working with the Earth,
7. Thomson Brooks.Odum, E.P.,Barrett, G.W. 2005.Fundamentals of Ecology, Ceneage Learning.

Semester IV General & 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
February-April	**General**	**GEOHGEC04T – Environmental Geography**	1. Human-Environment Relationship in equatorial, desert and coastal regions	**PPT Presentation, Black Board Teaching&**	Class Test 1	10	AR, SC
		Environmental problems and policies	4. Environmental Problems and Management: Biodiversity Loss; Solid and Liquid Waste. 5. Environmental problems and management: Desertification and soil erosion.	**PPT Presentation,**		15	
	SEC	**GEOSSEC02M – Advanced Spatial Statistical Techniques** □	1. Probability theory, probability density functions with respect to Normal, Binomial and Poisson distributions and their geographical applications	COMPUTER LAB		10	RB
			3. Correlation and Regression Analysis: Rank order correlation and product moment correlation; linear regression,	COMPUTER LAB		10	AR

			residuals from regression, and simple curvilinear regression. Introduction to multi-variate analysis.				
May-June		**GEOHGEC04T – Environmental Geography**	2. Concept of holistic environment and system approach 3. Ecosystem: Concept, structure and functions	**PPT Presentation,**	Class Test 2	10	AR, SC
			6. New Environmental Policy of India, 2006.	**PPT Presentation,**		10	AR
	SEC		2. Sampling: Sampling plans for spatial and non-spatial data, sampling distributions. Sampling estimates for large and small samples tests involving means andproportions	COMPUTER LAB		15	RB
	SEC	GEOSSEC02M – Advanced Spatial Statistical Techniques	4. Time Series Analysis: Time Series processes; Smoothing time series; Time series components.			10	AR

REFERENCES:

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

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SEMESTER-VI HONOURS

Lesson No.	Paper Code with Topic	Content	Methods and materials	Assessment	Number of Class Allotted in hours	Name of the Teacher
1. (February-April)	GEOACOR13T-Evolution of Geographical Thought	1. Development of Geography: Contributions of Greek and Chinese geographers 2. Impact of 'Dark Age' in Geography and Arab contributions 7. Contributions of Ratzel and Vidal deLaBlaché 8. Trends of geography in the post-World War-II period: Quantitative Revolution, systems approach.	PPT Presentation, Black Board Teaching	CLASS TEST #1	60	AR ,SC
2. (February-April)	GEOACOR14T-Remote Sensing and GIS	1. Principles of Remote Sensing (RS): Types of RS satellites and sensors 2. Sensor resolutions and their applications with reference to IRS and Landsat mission 5. Concept of GIS and its applicability ; GIS data structures: types: spatial and non-spatial, raster and vector 6. Principles of preparing attribute tables and data manipulation and overlay analysis	PPT Presentation, ICT classes, Black Board Teaching, Audio-Visual Mode of Teaching	CLASS TEST #1	40	RB, SR
3. (February-April)	GEOACOR14P-Remote Sensing and GIS	1. Preparation of land use and land cover map from standard FCC and its interpretation	PPT Presentation, ICT classes, GIS Lab	CLASS TEST #1	30	SR

4. (February-April)	GEOADSE04T – Hydrology and Oceanography	1. Systems approach in hydrology. Global hydrological cycle: Its physical and biological role 3. Drainage basin as a hydrological unit. Principles of watershed management 5. Major relief features of the ocean floor: characteristics and origin according to plate tectonics 6. Physical and chemical properties of ocean water	PPT Presentation, ICT classes, Black Board Teaching	CLASS TEST #1	50	SR, KP, RC
5. (February-April)	GEOADSE06T – Resource Geography	1. Approaches to Resource Utilization: Utilitarian, Conservational, Community based adaptive 2. Significance of Resources: Backbone of Economic growth and development 5. Distribution, Utilisation, Problems and Management of Mineral Resources: Bauxite and Iron Ore	PPT Presentation, ICT classes, Black Board Teaching	CLASS TEST #1	50	RB, SC
6.(May-June)	GEOACOR13T Evolution of Geographical Thought	3. Geography during the age of 'Discovery' and 'Exploration' (contributions of Columbus, Vasco da Gama, Magellan) 4. Dualism and Dichotomies (Ideographic vs. Nomothetic, Physical vs. Human, Determinism vs. Possibilism,) AR7. Contributions of Ratzel and Vidal deLaBlaché 5. Evolution of Geographical thoughts in Britain and United States of America 6. Contributions of Humboldt and Ritter 9. Evolution of Critical Geography: Behavioural, humanistic and radical	PPT Presentation, Black Board Teaching&	CLASS TEST #2	30	AR ,SC
7.(May-June)	GEOACOR14T-Remote Sensing and GIS	3. Preparation of False Colour Composites from IRS LISS-3 and Landsat TM and OLI data.	PPT Presentation, ICT classes, Black Board	CLASS TEST #2	20	RB, SR

		4. Principles of image correction and interpretation. Preparation of inventories of landuse land cover (LULC) features from satellite images. 7. Principles of GNSS positioning	Teaching, Audio-Visual Mode of Teaching			
8.(May-June)	GEOACOR14P-Remote Sensing and GIS	2. Representation of raster and vector data format 3. Area and length calculations from GNSS data	PPT Presentation, ICT classes, Black Board Teaching	CLASS TEST #2	30	AR, RB
9.(May-June)	GEOADSE04T – Hydrology and Oceanography	2. Run off: controlling factors. Infiltration and evapotranspiration 4. Groundwater: Occurrence and storage. Factors controlling recharge, discharge and movement 7. Water mass, T–S diagram 8. Ocean temperature and salinity: Distribution and determinants	PPT Presentation, ICT classes, Black Board Teaching	CLASS TEST #2	40	SR, KP, RC
10.(May-June)	GEOADSE06T – Resource Geography	3. Problems of resource depletion—global scenario (forest, water, fossil fuels). 4. Conservation of Natural Resources 6. Distribution, Utilisation, Problems and Management of Energy Resources: Conventional and Non-Conventional 7. Concept of Resource sharing: Wate	PPT Presentation, ICT classes, Black Board Teaching	CLASS TEST #2	40	RB, SC

References :

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 Mahalanobis Mahavidyalaya

Lesson Plan- 2021-22

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. Tanima Paul Das

			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. Tanima Paul Das Dr. Tanima Paul Das 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 histological slides (Lung, Liver,	Offline hands-on practical class	Assignments	10hrs 25hrs	Sahin Sultana

			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	5 hrs 10hrs 10 hrs	Sahin Sultana
		FNTGCOR02P: HUMAN BODY	1. Determination of pulse rate in Resting	Offline hands on practicals	Assignments	6hrs	Sahin Sultana

		AND NUTRITION (PRACTICAL)	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).**			6hrs 6hrs	
May-June	**Hons.**	**FNTACORO03T -FOOD CHEMISTRY, BIOPHYSICS AND BIOCHEMICAL PRINCIPLES(THEORY)**	**1.Lipid Chemistry** • Lipids: Classification- Fatty acids, triglycerides, phospholipids, Glycolipids, sterols and steroids. Eiconoids. • Edible fats and oils - physical and chemical properties, Hydrogenation and importance of fats in the diet. • Physical and chemical properties of saturated, monounsaturated, polyunsaturated fatly acids, Trans fatty acids, phospholipids, cholesterols and liposomes. • Essential fatty acids. **2. Enzymes** • Enzmes: Definition and structure. • Enzyme substrate interaction. • Enzyme kinetics, • MichaelisMenten constant(Km). • Enzyme inhibition • .Factors regulating enzyme activities,	Online class. Powerpoint Presentation and Lecture. E-books, Study materials	Class assignment	15 hrs 10hrs	Dr. Priyadarshini Chakraborty

			• 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 in digestive system (mouth, oesophagus,	Lecture method; Chalkboard, PDF	Assignments	20hrs	Sahin Sultana

			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.

Prasanta Chandra Mahalanobis Mahavidyalaya

Lesson Plan- 2021-22

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. Tanima Paul Das
		FNTACOR08P: COMMUNITY NUTRITION (PRACTICAL)	1. Anthropometric Measurement of infant - Height, weight, circumference of chest, mid -	Offline hands on practical, graphical interpretation,	Class assignment ,student seminar	10hrs	Dr. Tanima Paul Das

			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.	study visits to community centers like ICDS etc.		10hrs 6hrs	
		FNTACOR09T: EPIDEMIOLOGY AND PUBLIC HEALTH(THEORY)	**1. Introduction on Health** • Health and its importance: Definition of health (WHO), Dimension of health, Positive health. • Determinants of health. Concept of disease and its causations. 2. **Data of Community health** • Secondary sources of community health data: Indicators of health. • Secondary sources of data from NFHS, Vital Statistics, Census of India, ICMR. **3.Epidemiology** • Definition of epidemiology, components and aims of epidemiology, basic measurements in epidemiology. • Demography and family planning. Brief idea about epidemics, epidemiological methods: analytical epidemiology (case control and cohort study); Experimental epidemiology. • Infectious diseases in epidemiology. Dynamics of disease transmission, modes of transmission of disease. **4.Public health**	Lecture method; Chalkboard, PDF, WHO website e-material, Indian Academy of Pediatrics e - material	Assignments	6hrs 6hrs 10hrs 6hrs	Dr. Guddi Tiwary

			• Definition of public health, relation between health and nutrition.				
		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, • Hypertension: Aetiology, Risk factors, Patho-physiology, Management	Lecture method; Chalkboard, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh	Assignment	4hrs 15hrs 12hrs	Juthi Saha

			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	Juthi Saha
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. Tanima Paul Das
			Practical: 1. Visit to an ongoing program in ICDS: one rural, one urban. (eg. mahilamandal meeting or nutrition week celebration 2. Visit to a health centre (ANC clinic run by Government health department and observe quality of counseling imparted to pregnant women (especially awareness of anemia, importance of IFA). 3. To visit an NGO either rural or urban and observe one intervention program implemented for 59 women, school children or adolescence (For all the above observation appropriate observation check lists will be made and used)	Lecture 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. Tanima Paul Das

	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	Juthi Saha
		FNTGCOR04P: DIETETICS(PRACTICAL)	Planning and Preparation of fluid diet, soft and solid diet.	Offline practical class	Assignment	20hrs	Juthi Saha
May-June	**Hons**	**FNTACOR08T: COMMUNITY NUTRITION (THEORY)**	1.**Clinical Signs** • Clinical Signs: Need and importance, • Identifying signs of PEM, vitamin A deficiency and iodine deficiency, • Interpretation of descriptive list of clinical signs. • Nutritional anaemia. Rickets, B-Complex deficiencies. **2. Nutritional anthropometry** • Nutritional anthropometry:Need and importance,	Online class. Powerpoint Presentation and Lecture. E resources (E-PG path Sala) Study materials as pdf	Class assignment	8hrs 8hrs	Dr. Tanima Paul Das

			• 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. Tanima Paul Das
		FNTACOR09T: EPIDEMIOLOGY AND PUBLIC HEALTH(THEORY)	1**. Immunization** • Immunization : definition. Host defenses and immunity, immunizing agents: its types, national immunization schedule- its	Lecture method; Chalkboard, PDF, WHO website e-material, Indian Academy of	Assignment	8hrs	Dr. Guddi Tiwary

			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	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, • Eating disorders: (Anorexia Nervosa and Bulimia),	Lecture method; Chalkboard, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh	Assignment	15hrs	Juthi Saha

			• 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	Juthi Saha
	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. Tanima Paul Das
			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. Tanima Paul Das
	Programme Course	**FNTGCOR04T: DIETETICS (THEORY)**	**1. Dietary management of different diseases** • Dietary management in Gastro intestinal diseases (diarrhoea, constipation, gastritis, peptic ulcer &	Lecture method; Chalkboard, power point presentation and e-resources available on	Assignment	24hrs	Juthi Saha

			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	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. Juthi Saha

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. Banarasidas Bhanot. 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. Banarasidas Bhanot. Jabalpur.

For FNTACOR10T:

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

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

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

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

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

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

For FNTGCORO4T:

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

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

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

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

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

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

Prasanta Chandra MahalanobisMahavidyalaya

Lesson Plan- 2021-22

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 as cereal and cereal products, vegetable and	Online class. Powerpoint Presentation and Lecture. E resources (E-PG path Sala) Study materials as pdf	Class assignment	10hrs	Dr. Tanima Paul Das

			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 of ionizing radiations used in food irradiation,			12hrs	

			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. Tanima Paul Das
		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, environmental factors influencing food service	Lecture method; Chalkboard, power point presentation and e-resources available on SWAYAM (Inflibnet Centre); E-PG Pathshala, Egyankosh;	Assignment	20hrs	Ms. Juthi Saha

			operations, styles of food service				
		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 Commodities**	Lecture method; Chalkboard, PDF books	Class assignment.	16hrs 16hrs	Dr. Guddi Tiwary

			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 report Assignment	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. Tanima Paul Das
		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. Tanima Paul Das
		FNTACOR14T: RESEARCH METHODOLOGY AND BIOSTATISTICS(THEORY)	**1.Preparation of report** a. Graphical and diagrammatic presentation. b. Interpretation of – Meaning of	Lecture method, Chalkboard, PDF Books	Assessment	20hrs	Dr. Guddi Tiwary

			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	Juthi Saha
		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	Juthi Saha
		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 value, Polenske value,	PDF of study material, Chalkboard, Lecture method, E-books	Class assignments	10hrs	Dr. Priyadsrhini Chakraborty

			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 commodities).	Poster making, Chalk board, lecture,	Assignment	20hrs	Dr. Guddi Tiwary

				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 , 5th edi., S chand and Company.

For FNTADSE04T:

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

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

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

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

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

For FNTADSE05T:

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

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

For FNTGDSE03T:

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

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Lesson Plan- 2021-22

Semester II 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
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

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- 2021-22

Semester IV 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
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- 2021-22

Semester VI 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
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