GOA UNIVERSITY
Taleigao Plateau, Goa 403 206

REVISED MINUTES

of the 5th Meeting of the Standing Committee of

X ACADEMIC COUNCIL

Day & Date

Tuesday, 14th February, 2023 & Thursday, 23rd February, 2023

Time

10.00 a.m.

Venue
Council Hall,
Administrative Block
Goa University

D 3.24	**Minutes of the Board of Studies in International Studies meeting held through Circulation.** The Standing Committee of the Academic Council did not approve the minutes of the Board of Studies in International Studies meeting held through Circulation. The Chairperson was requested to refer the matter back to the Board of Studies to rework on the following and thereafter to be placed before the Academic Council for Consideration: 1. Course Codes for the Programmes to be revised. 2. Titles of the Course to be verified. 3. Content 'Module VIII' to be deleted from the Course Research Methodology in International Relations. 4. The syllabus to be re-submitted as per prescribed syllabus template. **(Action: Assistant Registrar Academic-PG)**
D 3.25	**Minutes of the Board of Studies in Economics meeting held on 29.10.2022.** The Standing Committee of the Academic Council partly approved the minutes of the Board of Studies in Economics meeting held on 29.10.2022 with the following suggestions: 1. Programme Structure for MA Economics Programme to be added. 2. Additional Courses under Research Specific Elective Courses and Generic Elective Courses to be recommended and placed before the Academic Council for consideration. 3. The proposal to start a 5-year integrated MA Economics Programme at Goa Business School (Annexure II) was discussed by the Academic Council. The Vice-Chancellor informed the House that a committee has been constituted for the purpose of drafting Ordinance pertaining to 5-year integrated Programme. **(Action: Assistant Registrar Academic-PG)**
D 3.26	**Minutes of the Board of Studies in Hospitality, Travel and Tourism Studies meeting held on 31.10.2022 and 04.11.2022.** The Standing Committee of the Academic Council approved the minutes of the Board of Studies in Hospitality, Travel and Tourism Studies meeting held on 31.10.2022 and 04.11.2022 with the following suggestions: 1. It was informed to maintain uniformity in the Syllabus for the Number of Hours, Credits, Prerequisites for the Course, Course Objectives, Content, Pedagogy, References/Readings and Course outcomes for Semester III and IV Master of Tourism and Travel Management Programme. 2. The syllabus for Master of Tourism and Travel Management Programme Semester I and II was approved. **(Action: Assistant Registrar Academic-PG)**
D 3.27	**Minutes of the Board of Studies meeting held on 10th November 2022 for the MSc-Integrated Programme.** The Standing Committee of the Academic Council partly approved the minutes of

Std. Com. X AC-5
14.02.2023

GOA UNIVERSITY
Taleigao Plateau, Goa 403 206

F I N A L A G E N D A

For the 5th Meeting of the Standing Committee of

X ACADEMIC COUNCIL

Day & Date

Tuesday, 14th February, 2023

Time

10.00 a.m.

Venue
Conference Hall
Administrative Block
Goa University

D 3.25 **Minutes of the Board of Studies in Economics meeting held on 29.10.2022.**

Part A

i. Recommendations regarding courses of study in the subject or group of subjects at the undergraduate level: NIL

ii. Recommendations regarding courses of study in the subject or group of subjects at the postgraduate level:

The syllabi of the discipline specific, general and research specific electives were placed for consideration.

After due deliberation the same was accepted by the members. The same may be placed for consideration of the Academic Council.

A proposal to start a five year integrated programme in Economics (MA Economics 5-year integrated) was also placed for consideration of the academic council as per currently circulated NEP format. The new programme is expected to meet two needs – (i) create a pool of economists who are trained in quantitative techniques right from the under-gradute stage. The entry requirement therefore requires the candidate to have mathematics as a subject of study in the higher secondary level (school), (ii) cater to the NEP to have a modular approach to interdisciplinary learning where a student on campus can take courses from multiple disciplines that allow cross-fertilisation of learning opportunities. Further, the proposal to start such a programme is not expected to affect the intake of existing BA Economics programmes of colleges as the entry requirements for the two programmes differ significantly.

The (i) draft set of ordinances, (ii) the programme structure, (iii) the syllabi of all discipline specific courses (six courses in Economics) for the first year were also placed for consideration of the members. Other courses for the first year will be shared courses with other 5 year integrated programmes already in operation in the university.

After due deliberation the same was accepted by the members. The same may be placed for consideration of the Academic Council.

iii. Recommendations regarding courses of study in the subject or group of subjects at the PhD level:

As per current GU Ordinance OA 19A.4 (ix a),

"The Research Scholar is required to undergo successfully the following three Theory Courses:

Research Methodology (3 credits)

ii. Advanced Theory related to the proposed research work in the chosen field of research (4 credits).

iii. Research and Publication Ethics (RPE) (3 credits). (1 Credit = 12 contact hours)"

In view of the NEP and Goa University adopting a 1 credit equivalence of 15 hours, the members deliberated on the PhD course on Research Methodology which comes under the purview of the BoS in Economics. The recommendations of the BoS with regard to this paper are as below:

a) Amendment of OA-19A.4: Now that Goa University is aligning to the 1 credit to 15 hours format, the Ordinance referred to above may need amendment by the Academic Council.

b) Approval of RM syllabus: In the limited scope of this BoS, members approved the Research Methodology course which is proposed to be a four-credit (equivalent to sixty hours) course. The reason for adopting a 4 credit course was in anticipation of changes in PhD Ordinances anticipated from UGC making the credit requirement of pre-PhD courses to 12 credits..

After due deliberation the same was accepted by the members. The same may be placed for consideration of the Academic Council.

Part B

Scheme of Examinations at undergraduate level: Not on agenda

ii. Panel of examiners for different examinations at the undergraduate level:Not on agenda

iii. Scheme of Examinations at postgraduate level: Not on agenda

Panel of examiners for different examinations at post-graduate level: Not on agenda

Part C

Recommendations regarding preparation and publication of selection of reading material in the subject or group of subjects and the names of the persons recommended for appointment to make the selection: Not on agenda

Part D

i. Recommendations regarding general academic requirements in the Departments of University or affiliated colleges: Not on agenda

ii. Recommendations of the Academic Audit Committee and status thereof: Not on agenda

Part E

Recommendations of the text books for the course of study at undergraduate level:

As placed in the syllabus for each course.

ii.Recommendations of the text books for the course of study at post graduate level:

As placed in the syllabus for each course.

Part F

i. The important points/recommendations of BoS that require consideration/approval of Academic Council (points to be highlighted) as mentioned below

a. Approval of DSE and RSE course for the MA Economics programme **(Annexure I Refer page No. 961)**

b. Approval to start a 5-year integrated MA Economics programme following the structure recommended under NEP on Goa University campus. **(Annexure II Refer page No. 980)**

c. Approval of syllabus of PhD course in Research Methodology as a four credit (60 hours) course. **(Annexure III Refer page No. 992)**

	ii. The declaration by the Chairperson that the minutes were readout by the Chairperson at the meeting itself. The minutes were read out by the Chairperson at the meeting Date : 29th October, 2022 Sd/- Place: Goa University (Professor Pranab Mukhopadhyay) Signature of the Chairperson **Part G**. The Remarks of the Dean of the Faculty 1. The minutes are in order. 2. The minutes may be placed before the Academic Council with remarks if any. 3. May be recommended for approval of Academic Council. 4. Special remarks if any. Date: 18/11/2022 Sd/- Place: Goa University Signature of the Dean **(Back to Index)**
D 3.26	**Minutes of the Board of Studies in Hospitality, Travel and Tourism Studies meeting held on 31.10.2022 and 04.11.2022.** **Part A** i. Recommendations regarding courses of study in the subject or group of subjects at the undergraduate level: **NIL** ii. Recommendations regarding courses of study in the subject or group of subjects at the postgraduate level: **M.Sc in International Hospitality and Tourism Management Annexure I (Refer page No. 994)** **Masters of Tourism and Travel Management (MTTM) Annexure II (Refer page No. 1033)** **Part B** i. Scheme of Examinations at undergraduate level: **NI** ii. Panel of examiners for different examinations at the undergraduate level: **NIL** iii. Scheme of Examinations at postgraduate level: **As per OA-35** iv. Panel of examiners for different examinations at post-graduate level: **NIL** **Part C** i. Recommendations regarding preparation and publication of selection of reading material in the subject or group of subjects and the names of the persons recommended for appointment to make the selection: **NIL** **Part D** i. Recommendations regarding general academic requirements in the Departments of University or affiliated colleges: **NIL** ii. Recommendations of the Academic Audit Committee and status thereof **NIL** **Part E**

D 3.25 Minutes of the Board of Studies in Economics meeting held on 29.10.2022.

Annexure I

Programme: M. A. ECONOMICS
Course Code: ECTE -- 407 Title of the Course: Labour Economics
Credits: 4 Hours: 60 Effective from AY: 2022-23

Prerequisites for the course:	Same as programme requirements	**Hours Per Module**
Objective:	To develop students' abilities in acquiring a better understanding of the functioning of labour market.	
Content:	**Module 1** **The Supply of Labour and Demand for Labour** Supply of labour by an individual, by a household to an economy – A Household model of labour supply – A bargaining model of family labour supply – Changes in work participation over time: Labour force growth during recessions: The Added Worker Effect-The Discouraged Worker Effect - Classical Theory of Job Choice - Modern Theory in terms of investment in Human Capital - Migration. The Demand for Labour in the short run and long run - Elasticity of demand for labour **Module 2** **The Labour Market and Theories of Labour Market Discrimination** Definition of the labour market – Differences between Labour Markets and Commodity Markets - Labour Market Structure: Structured Labour markets- Unstructured Labour Markets-Internal and External Labour markets; Primary and Secondary Labour Markets. Theories of Labour Market Discrimination: Types of discrimination – Taste-for- discrimination model. Market Power: The Monopsony model – Theory of Statistical discrimination – The Crowding model. **Module 3** **Employment**	**15** **15**

	Employment- Concept; Types of unemployment – The measurement of unemployment – Causes of unemployment: Job Search (The Stigler model, The McCall model)-Rigid Wages, Efficiency wages. Present Employment Scenario at the National and International level. **Module 4** **Wage Determination and Productivity Concept** Wage determination in a perfectly competitive market and Monopsony market – Minimum wage: Minimum wage in a perfectly competitive market and in a monopsony market. The minimum wage and efficiency wage theory. Segmentation and Dual Labour Market Theory. Productivity Concept - Measurement – Importance of productivity increases - Factors influencing labour productivity - Productivity and inflation - Productivity and employment.	**15** **15**
Pedagogy:	Chalk and talk aided by ICT enabled lectures PC lab exercises Assignments and presentations Group activity MOOC (or similar) Component	
References/Readings	**Core Readings** C1. Borjas G.J. (2015), Labour Economics, McGraw-Hill, New York. □□□□McConnell, C.R, S.L.Brue and Macpherson, (2010), Contemporary Labour Economics, McGraw Hill Irwin, New York. **Additional readings** □□□□Cahuc Pierre, Zylberberg A., (2014), Labour Economics, Mit Press, USA. A2. Ehrenberg R., (2017), Modern Labour Economics Theory and Public Policy, Routledge, U.S.A. □□□□Jacobson J., Skillman G., (2002), Labour Markets and Employment Relationships: A Comprehensive Approach. □□□□Kaufman B.E. and Hotchkiss J.L. (2006), Labour Market Economics, Cengage Learning, India.	

	□□□□Smith S.W. (2003), Labour Economics, Routledge, London. Bauder Harold (2006), Labour Movement: How Migration Regulates Labour Markets? OUP, USA	
Learning Outcomes	Students will be able to think independently on various issues related to labour Economics.	

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Programme: M. A. Economics
Course Code: ECTR-501 **Title of the Course: Research Methodology in Economics**
Number of Credits: 4 **Total Contact Hours**:60 **Effective from AY:** 2022-23

Prerequisites for the course:	Graduate in any discipline	Hours Per Module
Objective:	Expose students the methodological approaches to research Help formulate research problem Scientific methods for sampling and data collection Writing a research report/thesis/paper	
Content:	**Module 1** **Introduction to Research** The meaning of research - types of research - importance of research- research and policy- Deductive and Inductive Reasoning – Steps of scientific methods in research – Qualitative and Quantitative Approach - Mixed Methods.	15
	Module 2 **Steps in Research** The Research Process: Formulation of a Research problem – Guiding principles in the choice of a Research topic and Formulation of Research Questions –Writing a Proposal - Review of Literature and identification of research gap –Theoretical and Conceptual Framework-Formulation of Research Design – Hypothesis; concept, definition, formulation and testing.	15
	Module 3 **Survey based research** Sampling Techniques - field survey - Primary Data Collection - Tools – Observation, Schedule, Questionnaire – principles underlying construction of a questionnaire – data processing and Analysis – Use of Statistical packages.	15
	Module 4 **Writing a Research Report**	

	Writing a Research report - research paper – Bibliography - reference styles - Ethics in Research - Plagiarism - Writing a thesis - Do's and Dont's.	15
Pedagogy:	Chalk and talk aided by ICT enabled lectures PC lab exercises Assignments and presentations Group activity MOOC (or similar) Component	
References/Readings	**Core reading** C1. Kothari C.R., Garg, Gaurav; Research Methodology, Fourth Edition, New Age International, New Delhi, 2020. C2. Wilkinson T.S., and Bhandarkar P.L.: Methodology and Techniques of Social Science Research, Himalaya Publishing House, New Delhi, 2016. C3. Panneerselvam, R., Research Methodology, Prentice Hall of India Pvt Ltd, 2013. **Additional References** A1. Young P.V., Scientific Social Surveys and Research, Prentice Hall of India Pvt Ltd, 2012. A2. Parsons C.J., Thesis and Project Work, Allen &Unwin., 2006. A3. Babbie, Earl. R. 2013. "The Practice of Social Research." Cengage Learning, Canada. A4. John W. Creswell. 2014. "Research Design: Qualitative, Quantitative and Mixed Methods Approaches." Sage Publication, Washington, USA. A5. Kate L. Turabian. 2006. "A Manual for Writers of Term papers, Theses and Dissertations." The University of Chicago press, Chicago. A6. Blaug, Mark. 2009. "The Methodology of Economics." Cambridge University Press, Cambridge. A7. Daniel M. Hausman. 2007. "The Philosophy of Economics: An Anthology." Cambridge University Press, Cambridge	
Learning Outcomes	Upon completion of this course, the students are expected to: • Develop the most appropriate methodology for the research studies in social sciences.	

	• Familiarize and differentiate the use of various research methods and techniques. • Define a research problem and prepare the appropriate research design for the research problem. • Illustrate the data collection techniques and data analysis and presentation. • Demonstrate the sampling techniques and its fundamentals. • Familiarize the task of interpretation and the art of writing research reports.	

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Programme: M. A. Economics
Course Code: ECTR 502 Title of Course: Data Sources for the Indian Economy
Number of Credits: 4 **Total Contact Hours**:60 **Effective from AY:** 2022-23

Prerequisites for the course:	Graduate in any discipline	
Objective:	To learn the different sources of data available in the public domain both in India and globally. This will cover different domains of data requirements for economics research. Students would learn the extent and limitations of different data sources.	**Contact Hours per module**
Content:	Module 1: Macroeconomic Data Source Sources of the Government of India – Ministry of Finance, Reserve Bank of India, Niti Ayog Sources of Multilateral agencies – World Bank, International Financial Statistics, United Nations Private Sources – CMIE, EPWRF Module 2: Microeconomic Data Sources (including Demography, Labour, Agriculture and Industry) Sources of the Government of India – National Sample Organisation (NSSO data), Ministries of GoI, Census of India, Annual Survey of Industries, NFHS Sources of Multilateral agencies – Living Standards Private Sources – CMIE, IHDS, NCAER, IIPS, EPWRF Module 3: International Trade Data Sources Sources of the Government of India – Government of India	**15** **15** **15**

	(DGCIS, Ministry of Commerce, RBI) Sources of Multilateral agencies – United Nations (COMTRADE, WITS, UNCTAD, UNEP), World Bank (WDI), IMF (DOTS), WTO Private Sources – CMIE, EPWRF, WTC, GTAP, CEIC Module 4: Public Finance, and natural resources Sources of the Government of India – Finance Commission reports, Budget of the government of India and state governments, MOSPI, MOEFCC, RBI, DPSE Sources of Multilateral agencies – IBRD, UNEP, IPCC Private Sources – CMIE, EPWRF	**15**
Pedagogy:	Chalk and talk aided by ICT enabled lectures PC lab exercises Assignments and presentations Group activity MOOC (or similar) Component	
References Readings	**Core Reading** C1. Handbook of Statistics on Indian Economy, Reserve Bank of India (various years) C2. Economic Survey, Ministry of Finance, Government of India (various years) C3. Handbook of Statistics on Indian States, Reserve Bank of India (various years) C4. Report on Currency and Finance, Reserve Bank of India (various years) **Additional References** A1. NSSO (2001) Concepts and Definitions Used in NSS, National Sample Survey Organisation, Ministry of Statistics & Programme Implementation, Government of India, https://mospi.gov.in/documents/213904/0/concepts_golden.pdf/e98fc072-8660-edd9-f179-ce95674f4ca5?t=1615539414160	

	A2. Egger, Peter and Wolfmayr, Yvonne (2014) What Economists Should Know About International Goods Trade Data, WIFO Working Papers No. 475, Austrian Institute of Economic Research (WIFO), Vienna, https://www.econstor.eu/handle/10419/129020 A3. Donaldson,Dave and Adam Storeygard (2014) The View from Above: Applications of Satellite Data in Economics, *Journal Of Economic Perspectives*, 30(4)(pp. 171-98) A4. Auffhammer, Maximilian, Solomon M. Hsiangy, Wolfram Schlenker and Adam Sobelz (2013) Using Weather Data and Climate Model Output in Economic Analyses of Climate Change, *Review of Environmental Economics and Policy*, 7(2), 2013, (pp. 181–198) A5. World Bank (2021) World Development Report 2021 : Data for Better Lives. Washington, DC: World Bank.https://openknowledge.worldbank.org/handle/10986/35218 A6. Human Development Report, UNDP (various years) A7. World Trade Statistical Review, WTO (various years)	
Learning Outcomes	Students will know how to access data from open-domain data sources and help them undertake empirical research in a fruitful manner.	

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Programme: M.A. in Economics
Course Code: ECTR 503 **Title of the Course: Techniques of Geo-spatial analysis**
Number of Credits: 4 **Total Contact Hours: 60** **Effective from AY: 2022-23**

Prerequisites for the Course:	Basic knowledge of mathematics and statistics as per core requirements in MA Economics	
Objective:	Understand the use of spatial data and its applications in economics	**Contact Hours per module**
Content:	**Module 1:** Use of spatial data in economic analysis- Introduction to QGIS - its graphical user interface. Fundamentals of Remote Sensing Signals, Electromagnetic Spectrum, Terms and Units of Measurement, Electromagnetic Radiation Laws, Resolution of	15 hours

	a Sensor System,-Spatial, Spectral, Radiometric, Temporal and Angular resolution, sources of information remote sensing data **Module 2:** Raster and Vector Data formats- Interacting with data - identifying features, measuring and selecting data, creating shapefile, snapping, topology, attribute table and filed calculator, data joins, projections, clipping, analyzing elevation, terrain **Module 3:** Interpolation, buffer, Styling layers- raster, terrain, satellite images and landcover map, styling and labeling vector layers-point, line and polygon style, creating 3D map, print layout-map creation, 3D map view. **Module 4:** Analyzing raster data- raster calculator, Combining raster and vector data-converting between raster and vector and zonal statistics, Advanced raster and vector analysis with processing-Finding nearest neighbors, Converting between points, lines, and polygons, Calculating area shares within a region, regression, Reclassify raster layer.	15 hours 15 hours 15 hours
Pedagogy:	Chalk and talk aided by ICT enabled lectures PC lab exercises Assignments and presentations Group activity MOOC (or similar) Component	
Reference/ Readings:	**Core reading** C1. Andrew Cutts, Anita Graser(2018), Learn QGIS, Your Step-by-step Guide to the Fundamental of QGIS 3.4, Packt Publishing,4th Edition, Livery Place, UK. C2. Emilio Chuvieco (2016),Fundamentals of Satellite Remote Sensing An Environmental Approach,CRC Press Taylor & Francis Group C3. Quantum Geographic Information System (QGIS) training manual https://docs.qgis.org/3.10/en/docs/training_manual/index.html **Additional References** A1. Gary E. Sherman(2008), Desktop GIS mapping the planet with open source tools, Pragmatic Bookshelf, Raleigh, North Carolina Dallas, Texas.	

	A2. Otto Huisman, Rolf A. de (2009), Principles of geographic information systems: an introductory textbook, The International Institute for Geo-Information Science and Earth Observation (ITC), Netherlands. A3. Kurt Menke et.al (2016), Mastering QGIS, Packt Publishing, Livery Place, UK. A4. Erik Westra (2014), Building Mapping Applications with QGIS Create Your Own Sophisticated Applications to Analyze and Display Geospatial Information Using QGIS and Python, Packt Publishing,4th Edition, Livery Place, UK. A5. Jay D. Gatrell, Ryan R. Jensen (2009), Planning and Socioeconomic Applications(Geotechnologies and the Environment), Springer Science & Business Media. A6. J. M. Pogodzinski, Richard M. Kos(2013), Economic Development & GIS, Esri Press.	
Learning Outcomes:	Candidates will be able to extract and process spatial images using open source GIS software for economic decision-making.	

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Programme: M. A. Economics
Course Code: ECTR 504 **Title of the Course:** Introduction to Spatial Economics
Number of Credits: 4 **Contact Hours : 60** **Effective from AY:** 2022-23

Prerequisites for the course:	Basic knowledge of development studies and familiarity with use of spreadsheets.	**Hours**
Objective:	Introduce students to understanding the role of the spatial dimension in economic analysis. This will provide students an integrative approach that bridges the conventional analytical notions of development with tools of GIS (Geographic Information System) and Remote sensing.	
Content:	**Module 1** **Concepts in Spatial analysis** Geographic Information System- remote sensing, Multiscale analysis, Data models and scales of measurement- Raster imagery and Vector Data – Meaning and its objects- Base model- Scale of measurement, Spatial variation. Land use land cover classification method **Module 2** **Remote sensing application in socio-economic planning** Principles of Socio-Economic studies using remote sensing technologies, Socio-Economic information estimation-estimation of Population, Employment, GDP and Electric	15 15

	power consumption, Socio-Economic activity modelling, Advantages and limitations of remote sensing technologies in socio-economic application. **Module 3** **Sustainable planning** Sustainable demographic growth, Change analysis, Dynamic spatial modelling, case study, Vulnerability analysis: Conceptual framework, GIS – remote sensing place based modelling **Module 4** **Ecological mapping and monitoring** GIS & Remote sensing for ecological mapping & monitoring, Use of GIS data ecological application- gradient analysis, climate, topography, Remote sense data for ecological application, spectral enhancements, land cover, Habitat Structure, Biophysical process, Species distribution model, Biodiversity mapping, change detection	15 15
Pedagogy:	Chalk and talk aided by ICT enabled lectures PC lab exercises Assignments and presentations Group activity MOOC (or similar) Component	
References/Readings	**Core Reading** C1. Mesev, Victor (2007)- Integration of GIS and Remote Sensing-Wiley **Additional References** **rtin Wegmann, Benjamin Leutner, Stefan Dech (2016), Remote S** **IS for Ecologists: Using Open Source Software, Pelagic Publishing** A2. What uses Geographical Information Systems in Spatial Economics? https://www.newyorkfed.org/medialibrary/media/research/conference/2009/jrs/Overman.pdf A3. Robert Nash Parker, Emily K. AsencioJay, D. Gatrell, Ryan R. Jensen(2009), Planning and Socioeconomic Applications, Springer, Dordrecht. A4. Quantum Geographic Information System (QGIS) training manual https://docs.qgis.org/3.10/en/docs/training_manual/index.html	

	A5. Otto Huisman, Rolf A. de (2009), Principles of geographic information systems: an introductory textbook, The International Institute for Geo-Information Science and Earth Observation (ITC), Netherlands. A6. J. M. Pogodzinski, Richard M. Kos(2013), Economic Development & GIS, Esri Press. A7. Jay D. Gatrell, Ryan R. Jensen (2009), Planning and Socioeconomic Applications, Springer Science & Business Media. A8. Fahui Wang (2014), Quantitative Methods and Socio-Economic Applications in GIS, CRC Press.	
Learning Outcomes	The students will be able to extract and process Satellite images using open source software and use it to study economic and demographic change.	

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Programme: M.A. Economics
Course Code: ECTR-505 **Title of the Course: Time Series Econometrics**
Number of Credits: 4 **Total Contact Hours: 60** **Effective from AY: 2022-23**

Prerequisites for the Course:	Understanding of probability, statistics and basic Econometrics or equivalent	
Objective:	Equip the students to analyse time series data	**Contact Hours per module**
Content:	**Module 1** **Basic Regression Analysis with Time Series Data:** The Nature of Time Series Data, Static Models, Finite Distributed Lag Models, A Convention about the Time Index, Finite Sample Properties of OLS under Classical Assumptions, Functional Form, Dummy Variables, and Index Numbers, Trends and Seasonality, Characterizing Trending Time Series, Using Trending Variables in Regression Analysis, A Detrending Interpretation of Regressions with a Time Trend. Stationary and Weakly Dependent Time Series, Highly Persistent Time Series, Transformations on Highly Persistent Time Series,	15 hours 15 hours

	Dynamically Complete Models and the Absence of Serial Correlation **Module 2** **Serial Correlation and Heteroskedasticity in Time Series Regressions:** Properties of OLS with Serially Correlated Errors, Serial Correlation in the Presence of Lagged Dependent Variables, Testing for Serial Correlation, The Durbin-Watson Test under Classical Assumptions, Testing for AR(1) Serial Correlation without Strictly Exogenous Regressors, Testing for Higher Order Serial Correlation, Correcting for Serial Correlation with Strictly Exogenous Regressors, Feasible GLS Estimation with AR(1) Errors, Comparing OLS and FGLS, Correcting for Higher Order Serial Correlation, Differencing and Serial Correlation, Serial Correlation-Robust Inference after OLS, Heteroskedasticity in Time Series Regressions, Heteroskedasticity-Robust Statistics, Testing for Heteroskedasticity Autoregressive Conditional Heteroskedasticity, Heteroskedasticity and Serial Correlation in Regression **Module 3** **Models Pooling Cross Sections across Time:** Simple Panel Data Methods, Pooling Independent Cross Sections across Time, The Chow Test for Structural Change across Time, Policy Analysis with Pooled Cross Sections, Two-Period Panel Data Analysis, Organizing Panel Data, Policy Analysis with Two-Period Panel Data, Differencing with More Than Two Time Periods, Fixed Effects Estimation, The Dummy Variable Regression, Fixed Effects or First Differencing? Fixed Effects with Unbalanced Panels, Random Effects Models, Random Effects or Fixed Effects? The Correlated Random Effects Approach, Applying Panel Data Methods to Other Data Structures **Module 4** **Simultaneous Equations Models:** The Nature of Simultaneous Equations Models, Simultaneity Bias in OLS, Identifying and Estimating a Structural Equation, Identification in a Two-Equation System, Estimation by 2SLS, Systems with More Than Two Equations,	15 hours 15 hours

	Identification in Systems with Three or More Equations, Estimation of Simultaneous Equations Models with Time Series, Simultaneous Equations Models with Panel Data, Infinite Distributed Lag Models, The Geometric (or Koyck) Distributed Lag, Rational Distributed Lag Models, Testing for Unit Roots, Spurious Regression, Cointegration and Error Correction Models, Cointegration, Error Correction Models, Forecasting, Types of Regression Models Used for Forecasting, One-Step-Ahead Forecasting, Comparing One-Step-Ahead Forecasts, Multiple-Step-Ahead Forecasts, Forecasting Trending, Seasonal, and Integrated Processes	
Pedagogy:	Chalk and talk aided by ICT enabled lectures PC lab exercises Assignments and presentations Group activity MOOC (or similar) Component	
Reference/Readings:	**Core Reading** **C1.** Wooldridge, J. (2018). *Introductory econometrics: A modern approach* (7th edition). Cengage Learning. **Additional Reading** **A1.** Angrist, J. D., & Pischke, J.-S. (2009). *Mostly harmless econometrics: An empiricist's companion*. Princeton University Press. **A2.** Heiss, F. (2020). *Using R for introductory econometrics*..	
Learning Outcomes:	Advance use of time series econometric tools including knowledge of suitable software.	

Programme: M. A. Economics
Course Code: ECTG-501 **Title of the Course: Indian Agriculture**
Number of Credits: 4 **Total Contact Hours: 60** **Effective from AY: 2022-23**

Prerequisites for the course:	Graduate in any discipline.	
Objective:	To understand the agricultural development, problems faced and Government policies in India	**Hours Per Module**
Content	**Module 1**	15

	Role and Importance of Agriculture Agricultural Growth in India - pre and post-Independence period. Factors responsible for agricultural development – technology (seed, fertilizers), infrastructure (irrigation), policies (agricultural price support, subsidy, credit, land reforms). Agrarian distress and reforms **Module 2** **Resource use, Technology and Sustainable growth** Land and water resources- Land Utilization and irrigation cover, Cropping Patterns in different regions in India, Changes in agrarian structure in India. Bio-Technology - Trends and issues, Organic Farming - Present status and Future, Contract Farming, Agricultural Management – Concept, Recent trends and Problems- Food Security in India. **Module 3** **Credit, Marketing and Insurance** Credit in Indian agriculture: Sources of finance, factors determining the demand for credit, recent policy changes in regard to farm credit and their implications, Role of NABARD; Marketing: Regulated markets and market intervention, Marketing Channels and Functionaries, e-NAM, FPC and other initiatives Risk Mitigating Strategies, Need for Agricultural Insurance and Issues Involved, Schemes for Crop Insurance in India and their implementation. **Module 4** **Agriculture in Goa** Trends in agricultural growth rate, Gross Value Added in agriculture and allied sectors- crops, livestock, forestry and logging, fishing and aquaculture; Factors for decline of agriculture in Goa; Gaunkaris, Goa Tenancy Act and its implications for agriculture Development of Horticulture. State agricultural policy- need and importance. Interventions of NABARD in Goa: Rural Infrastructure Development Fund (RIDF), NABARD Infrastructure Development Assistance (NIDA), Marketing support.	15 15 15
Pedagogy:	● Chalk and talk aided by ICT-enabled lectures ● PC lab exercises ● Assignments and presentations	

	● Group activity ● MOOC (or similar) Component	
References/ Readings	**Core** C.1 Reddy, S. S., Ram, P. R., Sastry, T. V. N., & Devi, I. B. (2017). *Agricultural Economics*. Oxford and IBH. C2. Handbook of Agriculture, Indian Council of Agricultural Research C3. Dantwala, M. L. and Others (1991). Indian Agricultural Development Since Independence: A Collection of Essays. Oxford & IBH Publishing Co., New Delhi. C4. Economic Survey, Government of Goa, Directorate of Planning, Statistics & Evaluation, Goa (Various years)	
Learning Outcomes	The students will be able to understand agricultural development in India and analyze its progress.	

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Programme: M. A. Economics
Course Code: ECTG-502 Title of the Course: Health Economics
Number of Credits: 4 Total Contact Hours: 60 Effective from AY: 2022-23

Prerequisites for the course:	Graduate in any discipline.	
Objective:	Provide an understanding of health as human capital and recognise how health care markets differ from other conventional markets.	**Hours Per Module**
Content	**Module 1** **Economic Development and Health** Meaning, Relevance and Scope of Health Economics, General problems of Resource allocation in health care sector. Need versus demand. The demand for health as human capital. Models of demand – Grossman, Needs model and Components of costs. Supplier-induced demand. Role of pharmaceutical and medical equipment industries on demand. **Module 2** **Quality of Healthcare** Measurement of quality of care, Measurement of health state utilities - rating scales, standard gamble,	15 15

	and time trade-off; QALYs and its alternatives- different approaches of valuing health, Multi-attribute utility instruments and their development. **Module 3** **Healthcare in India** Demand and supply of healthcare in India, Different types of healthcare systems and Issues in Healthcare Delivery System, Share of GDP, Trends in cost of health care in India, National Health Policy – objectives and features, Financing health services- Sources of finance, Changes in Healthcare Finance, Public and private finance and provision; Healthcare Utilization & Expenditure in India. Intra-household inequality in health, Out of pocket expenditures. **Module 4** **Economics of Health Insurance** Competitive health insurance and risk adjustment, standard and substandard risk, Demand and supply of health insurance, asymmetric information and agency, market insurance, Adverse selection, the market for lemons, moral hazard; Health insurance in India: Private insurance, community-based insurance schemes – Issues in coverage: services covered and individual eligibility.	15 15
Pedagogy:	● Chalk and talk aided by ICT enabled lectures ● PC lab exercises ● Assignments and presentations ● Group activity ● MOOC (or similar) Component	
References/ Readings	**Core Readings** C1. Bhattacharya, J., Hyde, T., & Tu, P. (2013). *Health Economics*. Palgrave Macmillan. C2. Zweifel, P., Breyer, F., & Kifmann, M. (2009). Health Economics. Springer Berlin Heidelberg. **Additional Readings** A1. Phelps, C. E. (2017). *Health Economics* (6th edition). Routledge. A2. McPake, B., & Normand, C. (n.d.). *Health Economics: An International Perspective, Second Edition*. 313.	

	A3. Shirley Johnson Lans, 2005. A Health Economics Primer, Pearson Addison Wesley, New York A4. McPake Barbara, Kumarnayake Lilani and Normand Charles, 2008. *Health Economics: An International Perspective*. Second Edition Routledge, London. A5. Donaldson Cam and Karen Gerard 2004, Economics of health care financing: the visible hand, Palgrave Macmillan. New York.	
Learning Outcomes	After completing the course, the students will acquire the ability to describe, analyze, and evaluate the economic aspects of healthcare services and organizations	

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Programme: M. A. Economics
Course Code: ECTG 503 Title of the Course: Introduction to Finance
Number of Credits: 4 Total Contact Hours: 60 Effective from AY: 2022-23

Prerequisites for the course:	Graduate in any discipline.	
Objective:	To familiarise the students on the structure, components and mechanism of financial markets.	**Hours Per Module**
Content	**Module 1** Significance of Banking, Insurance and Financial Institutions, Structure of the Financial system, Financial Markets and Instruments, Financial Intermediaries, Financial market securities: Equity shares, Bonds and Mutual Funds, Regulating and promotional institutions in Indian Financial system : IRDA, RBI and SEBI **Module 2** Introduction to Financial Statements, Structure of Financial Statements: Balance Sheet, Income Statement, Statement of Cash Flow. Financial Ratios: Liquidity ratios, Leverage ratios, Turnover ratios, Profitability ratios, Capital Gearing ratios, Limitations.	**15** **15**

	Capital Budgeting Decision of firms, Introduction to risk and risk factors, Measuring investment risks, Diversification, Systematic and idiosyncratic risk. **Module 3** Discount rates and the Time Value of Money: Present value and Net Present Value, Compound interest, annuity and perpetuity formulas, Real and Nominal cash flows, Bond Valuation and Yield Curve. Asset Pricing Theories and Portfolio Analysis: Mean Variance Portfolio theory, Portfolio Optimization, Single Index Model, Capital Asset Pricing Model, Arbitrage Pricing Theory. **Module 4** The Derivatives and commodities markets: Forwards and Futures, Spot and Forward prices, Arbitrage, Hedging, Introduction to the Swaps market, Options: Call and Put Options, Pricing of stock options. Role of digital currencies and cryptocurrencies	**15** **15**
Pedagogy:	● Chalk and talk aided by ICT enabled lectures ● PC lab exercises ● Assignments and presentations ● Group activity ● MOOC (or similar) Component	
References/ Readings	**Core reading:** C1. David Luenberger (2013), Investment Science, Oxford University Press. **Additional References:** A1. R.E. Bailey (2005), The Economics of Financial Markets, Cambridge University Press. A2. Sharpe, W.F., Alexander, G.J. and Bailey, J.F. (2002) Investments, Prentice Hall India Pvt. Ltd. A3. John C. Hull (2022), Fundamentals of Futures and Options Markets, Global Edition, Pearson A4. Shapiro, A.C.and P. Hanouna (2019), Multinational Financial Management, John Wiley and Sons, Inc.	

Learning Outcomes	After completing the course, the students will be able to analyse financial information as a tool for financial decision-making.	

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Annexure II

Ordinance OB-XX relating to the Five Year Master of Arts in Economics (Integrated) Programme [M.A. Economics (Integrated)]

(Applicable from Academic Year 2023-24)

OB-XX.1 Objective

The Programme will provide students a modern approach to learning economics. It will offer an interdisciplinary learning environment to those who wish to specialise in the subject with a focus on quantitative approaches. The syllabus will be designed with the objective of providing skill sets that are compatible with contemporary industry and academic requirements.

OB-XX.2 Degree to be awarded, Exit options and Programme Structure

OB-XX.2.1 Degree Nomenclature

i. The nomenclature of the Programme shall be Master of Arts in Economics (Integrated).

ii. On completion of the Five Year Programme successful candidates shall be awarded M.A. (Economics).

iii. There will be an exit option at the end of each year as prescribed by the NEP and adopted by Goa University.

OB-XX.2.2 Exit Option

Candidates will be awarded the following certificate/diploma/ degree as per table below

Sr. No	Degree/Diploma/Certificate	Duration
	Certificate	1 year
	Diploma	2 Years
	B.A. (Honours)	3 Years
	B.A. (Honours with Research)	4 Years
	M.A.	5 Years

OB-XX.2.3 Programme Structure

1. The Programme shall consist of five Academic Years comprising of ten Semesters.
2. The Programme shall be based on a system of time-integrated Units called Credits, under the Choice Based Credit System (CBCS) and shall comprise Core
Courses, Domain and Elective Courses and Dissertation/Internship/Project (Optional).
4. A candidate shall be permitted to obtain up to 25% of total Elective Credits either from outside the School/Discipline or from outside the University. The programme shall recognize Elective Credits from outside the University under the credit transfer policy and bring this to the notice of the BoS.
5. The Courses may cover only Theory, Theory and Tutorial/Practical, or any other activity as specified by the BoS.
6. Elective Courses may also comprise Self-Learning Courses in the form of Field Work, Project, Summer Training, Online Courses, and other such Courses; the BoS shall specify the Credits for these activities.
7. A student shall also be permitted to obtain additional Credits. The Degree/Final Grade shall be awarded /computed based on her/his performance in Core Courses and the best performance in the Elective Courses, to fulfil the minimum number of Credits required for the award of the Master's Degree. Additional Credits, if any, shall be depicted in the final transcript/Mark Sheet.
8. A Course may be a minimum of one Credit and up to a maximum of six Credits.
9. One Credit of a Theory Course shall be equivalent to 15 contact hours of learning activities such as lecture, group discussion, seminar, problem solving and tutorial.
10. One Credit of a Practical Course shall be equivalent to 30 clock hours of Laboratory /Field Work/Study Tour, i.e. 15 Practical Sessions each of 2 clock hours duration, or its equivalent.
12. In case there are less than five students for the programme, permission of the Vice-Chancellor shall be obtained before the commencement of teaching for the said programme.
13. Project/Dissertation shall be a minimum of eight Credits and in lieu of Elective Courses.
14. A student shall not be permitted to register for less than twelve Credits and more than 26 credits in each semester during the five-year Programme. However, in case the dissertation is being carried out only in Semester X, entailing extensive field work, and/or work at other institutions, the student may be permitted to register for only the dissertation comprising not less than 8 Credits.

OB XX.3 SCHEME OF INSTRUCTION
Scheme of instruction will be governed by OA 35.3 and relevant amendments thereof.

OB XX.4 Eligibility and Admission
Eligibility for this Programme shall be:
1. A minimum of 55% in the Higher Secondary Examination or equivalent. Relaxation in minimum percentage for reserved categories shall be applicable as per Government Rules.
2. Mathematics as a subject of study in the Higher Secondary Examination or equivalent.
3. Admission shall be based on performance in the Entrance Test and as per guidelines of the Admission Committee of the Goa Business School.

OB XX.5 Scheme of Examination
Scheme of instruction will be governed by OA 35.5 and relevant amendments thereof.

OB XX.6 EVALUATION OF COURSES

Scheme of evaluation will be governed by OA 35.5 and relevant amendments thereof.

OB XX.7 EVALUATION OF DISSERTATION /INTERNSHIP

Evaluation of dissertation/internship will be governed by OA 35.7 and relevant amendments thereof.

OB XX.8 AWARD OF GRADES

Award of grades will be governed by OA 35.8 and relevant amendments thereof.

OB XX.9 IMPROVEMENT

This will be governed by OA-35.9 and relevant amendments thereof.

OB XX.10 Grievance Committee

This will be governed by OA-35.10 and relevant amendments thereof.

OB XX.11 COORDINATION

OB XX-11.1 The programme will be coordinated by a Program Director.

OB XX-11.2 The Discipline Faculty Committee (DFC) in Economics shall be responsible for the implementation and conduct of the Credit-based Master‟s Degree Programme(s). In case of Schools, the DFC shall comprise the Dean/Vice-Dean Academic, Programme Director and the faculty members of the Discipline.

OB XX.12 ACADEMIC AUDIT

Academic Audit will be governed by OA 35.12 and relevant amendments thereof.

OB XX.13 FEEDBACK

Student feedback will be governed by OA 35.13 and relevant amendments thereof.

Programme Structure

Semester	**Core (DSC) (4 credits; 60 hours)**	**Elective (DSE) (4 credits; 60 hours)**	**Generic Elective (GE) (4 credits; 60 hours)**	**Ability Enhancement Course (AEC) (2 credits; 30 hours)**	**Skill Enhancement Course (SEC) (2 credits; 30 hours)**	**I/A/P/C (2 credits; 30 hours)**	**Value Addition Courses (VAC) (2 credits; 30 hours)**	**Total Credit**	**Exit Options**
I	DSC-1: Introduction to Economics DSC-2: Introduction		**GE-1**	**AEC-1**	**SEC-1**		**VAC-1**	12+4+2+2+2=22	Exit with Certificate in Economics

	to Microeconomics DSC-3: Linear Algebra								
II	DSC-4: Game Theory DSC-5: Introduction to Macroeconomics DSC-6: Probability and Statistics I		**GE-2**	**AEC-2**	**SEC-2**		**VAC-2**	12+4+2+2+2=22	
III	DSC-7: Development Economics DSC-8: Growth Economics DSC-9: Basic Econometrics	DSE-1 (DSE or GE)		**AEC-3**	**SEC or (I/A/P/C)**		**VAC-3**	12+4+2+2+2=22	
IV	DSC-10: Linear Programming DSC-11: Public Finance DSC-12: Introduction to International Trade	DSE-2 (DSE or GE)		**AEC-4**	**SEC or (I/A/P/C)**		**VAC-4**	12+4+2+2+2=22	Exit with Undergraduate Diploma
V	DSC-13: Indian Economy DSC-14: Money and Banking DSC-15: Agricultural Economics	DSE-3	**GE-3**		**SEC or (I/A/P/C)**			12+4+4+2 = 22	Exit with graduation degree

VI	DSC-16: Financial Economics DSC-17: Environmental Economics DSC-18: Indian Public Finance	DSE-4	**GE-4**		**SEC or (I/A/P/C)**		12+4+4+2 = 22	
VII	DSC-19 DSC-20 DSC-21 DSC-22	DSE-5			**SEC or (I/A/P/C)**		12+4+4+2 = 22	Those joining with Bachelor's degree can exit with PG diploma
VIII	DSC-23 DSC-24 DSC-25 DSC-26	DSE-6			**SEC or (I/A/P/C)**		12+4+4+2 = 22	
IX	DSC-27 DSC-28	**GE-5 GE-6 GE-7 (GE or DSE or combination)**					8+12+2 =22	Exit with IMA in Economics Those joining with Bachelor's degree can get B.A. Honours with research
X	DSC-29					16 (Dissertation) Final evaluation of the project.	4+2+16 =22	

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Programme: MA Economics (Integrated 5 year)
Title of the Course: **Introduction to Economics**
Number of Credits: 4 Total Contact Hours: 60 Effective from AY: 2022-23

Prerequisites for the Course:	Same as programme prerequisites	Contact Hours

Objective:	The aim of the course is to introduce students to the basic concepts, theories and principles that will provide the foundation for a proper understanding of how an economy works. The syllabus seeks to equip students with the basic tools necessary for an understanding and interpretation of economic issues affecting the economy.	
Content:	**Module 1:** Scope and method of economics, the economic problem: scarcity, choice and opportunity cost, Inputs, Outputs and Production Possibility Frontier **Module 2:** Building blocks of modern economy – agents, resources and classification of goods. Microeconomic analysis – consumer equilibrium, producer equilibrium, market equilibrium, general equilibrium **Module 3:** Macroeconomic analysis – circular flow and national income, issues related to growth, unemployment and inflation. Public Economics and the environment: Government taxation and expenditure, **Module 4:** International Trade: Comparative advantage among nations, gains from trade; tariffs and protection, exchange rates;	15 15 15 15
Pedagogy	1. Chalk and talk aided by power-point lectures 2. PC lab exercises 3. Assignments and presentations 4. Group activity 5. MOOC (or similar) Component	
Reference/ Readings	Mankiw, G., (2018). Principles of Economics, 8th Edition, Boston: Cengage Learning.	
Learning Outcomes	1. The students will be able to understand the basic concepts-principles and theories of Economics. 2. This course will enable the students to understand and analyse different types of equilibrium, circular flow of the economy and factors affecting growth and employment in an economy. 3. The students will learn the basics of international trade and fundamental concepts in public economics.	

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Programme: MA Economics (Integrated 5 year)
Title of the Course: **Microeconomics**
Number of Credits: 4 Total Contact Hours: 60 Effective from AY: 2022-23

Prerequisites for the Course:	Same as programme prerequisites	Hours
Objective:	Equip the students to understand consumer and firm behavior under profit and non-profit maximizing framework.	
Content:	**Module 1: Introduction and Basic Concepts** Nature and scope of micro economics – concept of equilibrium – static, dynamic and neutral equilibrium – Partial Vs. General equilibrium – role and limitations of price mechanisms in a free market economy **Module 2: Theory of Demand** Theory of Consumer Behavior- Utility, indifference curve, [income and substitution effects, Slutsky‟s theorem, compensated demand]; Revealed preference; consumer surplus; **Module 3: Theory of production and costs** Production function –short period and long period; law of variable proportions and returns to scale; Isoquants – least cost combination of inputs; Returns of factors; Economies of scale; Elasticity of substitution; Euler‟s Theorem; Cobb-Douglas, CES, VES and Translog. Cost	15 hours 15 hours 15 hours
	functions, cost curves, Elasticity of supply. **Module 4: price and output determination** Demand and supply equilibrium; Cobweb theorem. Market forms – perfect and imperfect forms – equilibrium under perfect, monopoly, monopolistic, duopoly and oligopoly – importance of time element in price theory – price discrimination and measure of monopoly power – control and regulation of monopoly.	15 hours
Pedagogy:	Lectures/ tutorials/assignments/self-study	
Reference/ Read ings:	1. Varian, Hal R., *Intermediate Microeconomics*, Current Edition, W.W. Norton and Company 2. Andreu Mas-colell, Michael D. Whinston and Jerry R. Green John, *Microeconomic Theory*, Oxford University Press, Current Edition.	
Learning Outcomes:	Understand the factors that determine consumption and production decisions under different market structures.	

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Programme: MA Economics (Integrated 5 year)
Title of the Course: **Linear Algebra**
Number of Credits: 4 Total Contact Hours: 60 Effective from AY: 2022-23

Prerequisites for the course:	Same as programme prerequisites	
Objectives:	The aim of this course is to provide students an introduction to vectors and matrices and their use in Data Sciences.	
Content:	**Module 1** Linear Equations in Linear Algebra: Systems of linear equations, row reduction, and echelon forms, Vector equations, matrix equation, solution sets of linear systems, linear independence, Matrix of linear transformation.	15 hours
	Matrix Algebra: characteristics of invertible matrices, Partitioned matrices, matrix factorizations, application to computer graphics, dimension and rank. Determinants: Properties, Cramer‟s rule, volume and linear transformations. **Module 2** Vector Spaces: vector spaces and subspaces, linear transformations, Bases, coordinate systems, Dimension of a vector space, rank, change of bases; **Module 3** Eigenvalues and eigenvectors: Characteristics equation, diagonalization, eigenvectors and linear transformations, discrete dynamical systems; Orthogonality: inner product, length, and orthogonality, orthogonal sets, orthogonal projections, Gram-Schmidt process, inner product spaces **Module 4** Symmetric matrices and quadratic forms: diagonalization of symmetric matrices, quadratic forms, constrained optimization, Singular Value Decomposition (SVD).	15 hours 15 hours 15 hours
Pedagogy:	Lectures/ tutorials/assignments/self-study	

References/ Re adings:	1. David C. Lay, Linear Algebra and its Applications, Pearson. 2. Jim DeFranza and Daniel Gagliardi, Introduction to Linear Algebra with Application, McGraw Hill Education (India) 3. Steven J. Leon, Linear Algebra with Applications 8th Edition, Pearson. 4. Gilbert Strang, Introduction to Linear Algebra 4th Ed. South Asian Edition, Wellesley-Cambridge Press	
Learning Outcomes:	Use computational techniques and algebraic skills essential for the study of systems of linear equations, matrix algebra, vector spaces, eigenvalues and eigenvectors, orthogonality and diagonalization etc. to understand, formulate and solve the problems involving Computer Application.	

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Programme: MA Economics (Integrated 5 year)
Title of the Course: **Macroeconomics**
Number of Credits: 4 Total Contact Hours: 60 Effective from AY: 2022-23

Prerequisites for the course:	Same as programme prerequisites	**Hours**
Objectives:	Provide a basic understanding of how aggregate variables like national income, aggregate prices, employment, and exchange rates get determined by interaction of public policy and individual agents	
Content:	**Module 1: Introduction to Macroeconomics : What is it about.** Aggregate Income and its Dimensions, Measuring output, Real and Nominal Incomes, Savings, Balance of Payments and the Money supply. The sources and Use of Savings, The Balance of Payments, **Module 2: Consumption & Investment.** Keynes on Consumption, Consumption Smoothing, Temporary and Permanent Shocks, Stochastic Income Expectations, Effect of Interest Rates, Aggregating Across Individuals, Savings and Portfolio Choice, Profit Maximization and the Optimal Capital Stock, Adjustment Costs and Investment Decisions, Financial Structure and Investment, Residential and Inventory Investment, Irreversibility and Investment, Investment in Developing Countries, Investment in India	15 15

	Module 3: Trade Balance and Exchange rates, Demand for Money, Labour market. The Real Exchange Rate, Other Approaches to the Trade Balance, Exchange Rates and Assets, Purchasing Power Parity, Choice of Exchange Rate Regimes, Money, Bonds, and Private Wealth, Nominal and Real Interest Rates, Financial Assets and the Budget Constraint, Money as a store of value, Seigniorage, Profit Maximization and Labour Demand, Utility and Labour Supply, Aggregate Supply with / without Money illusion, Introducing Unemployment, Cyclical Unemployment and the Output Gap, The Static Phillips Curve, The Dynamic Phillips Curve **Module 4: IS-LM model :** Walras Law, Nominal Versus Real Rate of Interest, The IS Curve, The LM Curve, IS and LM - Fiscal and Monetary Policy, IS - LM in India, Ricardian Equivalence– determination of equilibrium income and interest rates – fiscal and monetary policy.	15 15
Pedagogy:	Lectures/ tutorials/assignments/self-study	
References/ Readings	*Essential Reading* 1. Macroeconomics by Errol D'Souza, Pearson Education, Delhi Second Edition 2012 *Additional Reading* 2. Macroeconomics: Theories and Policies, by Richard T. Froyen, Pearson Education, 10th Edition or later, 2013	
Learning Outcomes	Understand the factors that determine consumption and production decisions under different market structures.	

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Programme: MA Economics (Integrated 5 year)
Title of the Course: **Probability and Statistics - I**
Number of Credits: 4 Total Contact Hours: 60 Effective from AY: 2022-23

Prerequisites for the course:	Same as programme prerequisites	
Objectives:	This course aims to introduce the basic concepts of probability theory	

Content:	**Module 1:** Experiments and sample spaces, events, algebra of events, probability axioms, conditional probability, independence of events, mutually exclusive events. Bayes theorem. **Module 2:** One dimensional random variable: discrete and continuous random variable, characteristics of distributions, cumulative distribution function, functions of one random variable. **Module 3:** Two dimensional random variable: marginal and conditional distributions, conditional expectation independence. Covariance and correlation. Understanding linkages, visualizing **Module 4**: Discrete distributions: Bernoulli, Binomial, Poisson	15 hours 15 hours 15 hours 15 hours
Pedagogy:	Lectures/ tutorials/assignments/self-study	
References/ Readings	1. William W. Hines and Douglas C. Montgomery, Probability and Statistics in Engineering and Management Science, Wiley India Pvt. Ltd., 2003 2. T.Veerarajan, Probability, Statistics and Random Processes, Tata McGraw Hill Pub. Co. Ltd., 2009	
Learning Outcomes	Upon successful completion of this course, students will have a good understanding of elementary probability	

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Programme: MA Economics (Integrated 5 year)

Title of the Course: **Introduction to Game Theory**

Number of Credits: 4 Total Contact Hours: 60 Effective from AY: 2022-23

Prerequisites for the course:	Same as programme prerequisites	
Objective:	This course is intended to provide students with an Introduction to game theory and basic application in Economics	
Content:	**Module 1** **Introduction to Game Theory** Nash Equilibrium: Theory, Strategic games, Best response functions, Dominated actions, Equilibrium in a single population: symmetric games and symmetric equilibria **Module 2**	15 Hours 15 Hours

	Nash Equilibrium applications Illustrations; Cournot's model of oligopoly, Bertrand's model of oligopoly, Electoral competition, The War of Attrition, Auctions. Mixed Strategy Nash equilibrium, Dominated actions, Pure equilibria when randomization is allowed, Equilibrium in a single population, The ultimatum game and the holdup game, Stackelberg's model of duopoly **Module 3** **Extensive Games with Perfect Information** Theory, Extensive games with perfect information, Strategies and outcomes, Nash equilibrium, Subgame perfect equilibrium, Finding subgame perfect equilibria of finite horizon games, backward induction **Module 4** Extensive Games with Perfect Information: Extensions and Discussion, Allowing for simultaneous moves, Coalitional Games and the Core, Coalitional games, The core	15 Hours 15 Hours
Pedagogy:	Chalk and talk aided by ICT enabled lectures PC lab exercises Assignments and presentations Group activity MOOC (or similar) Component	
References/Readings	**Core Reading** **C1.** Martine, Osborne . (2009), An Introduction to Game Theory, Oxford University Press, Oxford. **Additional References** A1. Dixit, Avinash.;Skeath, Susan and Reliey, David H. (2015), Games of Strategy, W. W. Norton & Company, New York. A2. Rasmusen, E. (2007), Games and Information, Blackwell, Maiden, M.A.	
Learning Outcomes	The students will be able to explain the strategic behaviour of agents in a world of perfect information.	

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Annexure III

Programme: Doctor of Philosophy
Course Code: ECRM-601
Title of the Course: Research Methodology in Economics
Number of Credits: 4
Effective from AY: 2023-24

Prerequisites for the course:	Post graduate in any discipline	Hours Per Module
Objective:	Provide exposure to incoming research students in economics to a broad range of research protocols and methods	
Content:	.**Module -1: Objectives and types of research:** Motivation and objectives – Research methods vs Methodology. Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical. Defining and formulating the research problem - Selecting the problem - Importance of literature review in identifying research gap, Development of working hypothesis. **Module-2 Research design and methods:** Research design – Basic Principles- Need of research design –– Features of good design – Important concepts relating to research design – Observation and Facts, Laws and Theories, Prediction and explanation, Induction, Deduction, Development of Models. Developing a research plan - Exploration, Description, Diagnosis, Experimentation. Determining experimental and sample designs. **Module- 3: Data Collection and analysis:** Execution of the research - Observation and Collection of data - Methods of data collection – Sampling Methods- Data Processing and Analysis strategies, Hypothesis Testing, Probability Distribution – Normal, Student 't'-distribution, chi-square & F-distribution – Hypothesis Testing for Statistical Significance – Correlation and two variable regression, Anova test. **Module -4: Reporting and thesis writing:** Structure and components of scientific reports - Types of report – Technical reports and thesis – Significance – Different steps in the preparation – Layout, structure and Language of typical reports – Illustrations and tables - Bibliography, referencing and footnotes - Oral presentation – Planning – Preparation – Practice – Making presentation – Use of visual aids - Importance of effective communication.	15 15 15 15
Pedagogy:	In class or MOOC of GU	

References/ Readings	• Kothari C.R., Garg, Gaurav; (2020), *Research Methodology*, Fourth Edition, New Age International, New Delhi.. • John W. Creswell. 2014. "*Research Design: Qualitative, Quantitative and Mixed Methods* Approaches, Fourth Edition, Sage, NewDelhi. • Babbie, Earl. R. 2013. "*The Practice of Social Research.*" Cengage Learning, Canada. • Young P.V., *Scientific Social Surveys and Research*, Prentice Hall of India Pvt Ltd, 2012. Cooper, R. Donald and Pamela S. Schindler (2003) *Business Research Methods*, Delhi, Tata McGraw-Hill. Kumar, Renjith (2009) *Research Methodology: A Step by Step Guide for Research*, Delhi, Pearson Education. Uma, Shekaran; and Bougie, Roger (2016) *Research Methodology for Business: A Skill Building Approach*, Wiley, New York, John Wiley Publishers. • Kate L. Turabian. 2006. "*A Manual for Writers of Term papers, Theses and Dissertations*." The University of Chicago press, Chicago.	
Learning Outcomes	Upon completion of this course, the students are expected to: • Develop the most appropriate methodology for the research studies of their choice. • Familiarize and differentiate the use of various research methods and techniques. • Define a research problem and prepare the appropriate research design for the research problem. • Illustrate the data collection techniques and data analysis and presentation. • Demonstrate the sampling techniques and its fundamentals. • Familiarize the task of interpretation and the art of writing research reports.	

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