Banaras Hindu University

Faculty of Social Sciences

Department of Economics

Masters of Arts in Economics (Energy Economics)

(In force from Session 2022-23)

Revised & Updated Ordinance, Course Structure & Curriculum

Content

BANARAS HINDU UNIVERSITY
Faculty of Social Sciences
DEPARTMENT OF ECONOMICS

SYLLABUS — MASTER OF ARTS IN ECONOMICS
(ENERGY ECONOMICS)
IN FORCE FROM SESSION 2022-23

Objectives

1. Training Students in basic Economics of Energy and techniques of analysis.
2. Generalized training with more intensive selected areas of Energy Economics.
3. Enabling students to analyse relevant issues of Energy and find solutions to complex problems of Renewable and non-renewable Energy.
4. Keeping tact with the latest development in the dynamic field of Energy .

Outcome

After Successful completion of the course students—

- would be able to find a rewarding job in the organized job market in the private and the public sectors.
- would be able to start his/her own business like setting up his/her own concerns or taking up consultancy services
- would be able to undertake quality research for himself/herself/ the organization he/she decides to serve
- would be better equipped in Energy policy formulation and economic administration.

Structure

M.A. Economics (Energy Economics) will be a four semester, 64 credit Course. Total Number of Courses spread over 4 Semesters in the MA Course will be – 19. These Courses are divided into five broad categories. Their spread and weightage is shown in the Table given below-

Types of Courses in MA Economics (Energy Economics)

Sl. No.	Type of Course	Number of Credits Per Course	Total Number of Course of the type	Total Credits for the Particular Type
1	Core/Compulsory Courses	3	11	33
2	Core/Compulsory Courses	4	4	16
3	Seminar Presentation	5	1	5
4	MOOCS/DST Courses	2	2	4
5	Project/Dissertation	6	1	6

The Semester wise breakup of the Courses is given below:

Semester wise Details of Core and MOOCS/DSTCourses

Type of Courses	Semester I	Semester II	Semester III	Semester IV	TOTAL
Core/Compulsory	05	05	03	02	15
Project/Field Work/ Dissertation	00	00	00	01	01
Seminar Presentation on Internship Report	00	00	01	00	01
MOOCS/DST Course	00	01	01	00	02
TOTAL	05	06	05	03	19

Semester-I& II

Course	Semester-I **Core Courses-05**	Course	Semester-II **Core Courses-05**
MEE-101	Applied Microeconomics	MEE -201	Applied Econometrics
MEE-102	Applied Macroeconomics	MEE -202	Natural Resource Economics
MEE-103	Energy Economics	MEE -203	Economics of Green Energy
MEE-104	Environmental Economics	MEE-204	Research Methods
MEE-105	Applied Statistics	MEE-205	Evaluation of Mineral Resources
XXXX	XXXXXXX	MEE-206	MOOCS/DST Course -Financial Modelling

Semester-III& IV

Course	Semester-III **Core Course - 03**	Course	Semester-IV **Core Course - 02** Field Work/Dissertation & Viva-Voce – 01
MEE -301	Operations Research	MEE-401	Project Evaluation
MEE -302	International Trade and Business in Energy	MEE -402	Energy Efficiency and Audit
MEE -303	Energy Policies and law	MEE -403	Field Work/Dissertation & Viva-Voce
MEE -304	Seminar Presentation on Internship Report	XXXXXXX	
MEE -305	MOOCS/DST Course - Computation Skills		

A brief description of the Core/Compulsory and MOOCS/DST Courses is given below:

Core/Compulsory Courses

Core/ Compulsory Courses will be mandatory for all the students. There will be 15(Fifteen) Core Courses in all. Out of these (five) Courses each would be taught in Sem-I & Sem-II, while 3 (three) Courses would be taught in Sem-III &while 2 (two) Courses inSem-IV, mentioned as above.

MOOCS/DST Course

MOOCS/DST Courses will be mandatory for all the students. There will be 02 (Two) MOOCS/DST Courses in all. Out of these 01 (one) Course would be taught in Sem-II &01 (one) Course would be taught in Sem-III.

Seminar Presentation on Internship Report

Seminar Presentation on Internship Report will be mandatory for all the students. There will be 01 (ONE) Course of Seminar Presentation on Internship Report in Sem-III. Internship Report submitted by the students would be evaluated by Internall Examiners appointed by the University for marks of 60 (Sixty). Remaining 40(Forty) marks would be for Seminar presentation of Internship Report. It will be conducted by the Department as per the rules and regulations of the University.

Project Work/Dissertation

The MA in Economics (Energy Economics) students in the final semester would be required to do project work/ dissertation. Dissertation submitted by the students would be evaluated by External Examiners appointed by the University for marks of 70 (Seventy). Remaining 30(Thirty) marks would be for Viva-Voce that will be conducted by the Department as per the rules and regulations of the University.

Master of Arts in Economics (Energy Economics)
Semester-wise Syllabi

Semester-I

Course	Semester-I **Core Courses-06**	Credit
MEE -101	Applied Microeconomics	03
MEE -102	Applied Macroeconomics	03
MEE -103	Energy Economics	04
MEE -104	Environmental Economics	03
MEE -105	Applied Statistics	03

Semester-I Core Paper
MEE 101: Applied Microeconomics

Unit 1: Central economic problems, Business decision-making. (2 Lectures)

Unit 2: Demand analysis and estimation: Duality and consumer demand, restrictions in demand theory, Static and dynamic demand functions with examples, short-run and long-run demand functions, Partial and complete demand systems: Engel expenditure model and linear expenditure system,Demand for Energy as a Derived Demand; Consumer demand and producer demand, Demand Substitution among Energy Commodities; demand forecasting and its tools.(11 Lectures)

Unit 3: Production function estimation: Cobb-Douglas, Leontief, Constant Elasticity of Substitution (CES), Variable Elasticity of Substitution (VES), trans-log production functions and their properties; duality: output maximization and cost minimization; derivation of input-demand functions; returns to scale and to a factor.(10 Lectures)

Unit 4: Derivation of cost function from production function, Empirical estimation of cost functions: linear, quadratic, and cubic cost functions, Envelope curve, economies of scale and scope, L-shaped cost curve, taxes and subsidies, break-even and shut-down point analysis, cost forecasting. (10 Lectures)

Unit 5: Introduction to Market Structure:Oligopolistic market: collusive and non-collusive models, Limit pricing models,Energy market and Pricing: Structure of energy markets, Natural resource Cartels: An example of OPEC, energy trading and auctions, Concepts of energy pricing, Empirical Determination of Breakeven (economic) Price.(12 Lectures)

Selected Readings:

1. Banks, Blundell and Lewbel. (1997). Quadratic Engel Curves and Consumer Demand. Review of Economics and Statistics 79(4): 527-539.
2. Barnett, W. A., &Serletis, A. (2008). Consumer preferences and demand systems. Journal of Econometrics, 147(2), 210-224.

3. Cameron, A. C., & Trivedi, P. K. (2005). Microeconometrics: methods and applications. Cambridge university press.
4. Deaton and Muellbauer. (1980). An Almost Ideal Demand System. American Economic Review 70 (3): 312-326.
5. Deaton, A. (1992). Understanding consumption. Oxford University Press.
6. Deaton, A., &Muellbauer, J. (1980). Economics and consumer behaviour. Cambridge university press.
7. Heathfield, D. F. (2016). An introduction to cost and production functions. Macmillan International Higher Education.
8. Henderson, James M. &Quandt, Richard E (1980): Microeconomic Theory: A Mathematical Approach, McGraw-Hill, 1st Edition.
9. Keller, W. J. (1976). A nested CES-type utility function and its demand and price-index functions. European Economic Review, 7(2), 175-186
10. Koutsoyiannis, A. (1975). Modern microeconomics. Springer.
11. Krishna, K. L. (Ed.). (1997). Econometric Applications in India. Oxford university press.
12. Nicalson& Snyder (2012), Microeconomics theory: Basic principles and extensions, 11th edition.
13. Phlips, L. (2014). Applied consumption analysis: advanced textbooks in economics. Elsevier.
14. Pollak, R. A., & Wales, T. J. (1992). Demand system specification and estimation. Oxford University Press.
15. Prasad A.R.& Mohan I.(2022), A Study of Consumer Demand: An Exposition with Simple Mathematics, Himalaya Publishing House.
16. Radhakrishnan, R (2019). Essay on the Econometrics of Consumer behavior, Academic Foundation.
17. Stone, R. (1954). Linear expenditure systems and demand analysis: an application to the pattern of British demand. The Economic Journal, 64(255), 511-52.
18. Varian, Hal R. (1992), Microeconomic Analysis, W. W. Norton & Company 3rd edition.
19. Andreu Mas-Colell Michael D. Whinston& Jerry R. Green (1995): Microeconomics theory, Oxford University Press, New Yark
20. David M. Kreps (1990), A course in Microeconomics theory, Princeton University Press
21. Geoffrey A. Jehle, Philip J. Reny (2011), Advance Microeconomics theory, Prentice Hall 3rd edition,
22. Hugh Gravelly & Ray Rees (2004): Microeconomics, Prentice Hall, 3rd edition,
23. Koutsoyiannis, A. (1975). *Modern microeconomics*. Springer.
24. Pindyck, R. S., Rubinfeld, D. L., & Mehta, P. L. (1995). *Microeconomics* (Vol. 4). Englewood Cliffs, NJ: Prentice Hall.
25. Henderson, James M. &Quandt, Richard E (1980): Microeconomic Theory: A Mathematical Approach, McGraw-Hill, 1st Edition,

26. Choudhury Kalyanjit, (2004), Modern Microeconomics, Pragati Publication, Part-1 & 2

MEE102: Applied Macroeconomics

Unit-1: National Income Accounting and National Income Identities, Measurement of National Income and Growth Rates in India, Circular Flow of Income in a two, three and four sector economy (8 Lectures)

Unit-2: Determination of Income, Output & Employment- Classical Approach (Introductory), Keynesian Approach and Introduction to Post-Keynesian debate (New Classical Vrs. New Keynesian), Consumption Function- Absolute Income Hypothesis and preview of post-Keynesian theories, Investment Function-MEC & MEI- Multiplier & Accelerator (Introduction & Application), Analysis of Fiscal and Monetary policies in the closed and open economy IS-LM models, including the Mundell-Fleming model.(13 Lectures)

Unit-3:Supply of Money –The H-Theory, R.B.I. Classification, Understanding the components of supply of money in India and their significance for business and economy, Methods followed by the RBI to regulate Supply of Money.(9 Lectures)

Unit-4: Demand for Money-Concept & Determinants (theoretical as well as applied perspective), Preview of theories of Demand for Money Estimating Demand for Money in India.(6 Lectures)

Unit-5: Macroeconomic Problem- Inflation & Unemployment- Phillips Curve, Theoretical Model of Inflation in India, Measurement of Inflation in India, Economic Fluctuations-Nature and Characteristics of Trade Cycle, causes of occurrence of trade cycle from demand side (theoretical interpretation has to be given) and supply side (In context of Real Business Cycle Theory), Recent Crises in the world. (9 Lectures)

Suggested Readings:

1. Frisch, H: Theories of Inflation, Cambridge University Press
2. Dornbusch, Fischer &Startz, Macroeconomics, Tata McGraw-Hill Publishing Co. Ltd.
3. Snowdown Brian and Richard Vane, 'Modern Macroeconomics' Edward Elgar Publishing House
4. Mankiw Gregory, Macroeconomics, Worth Publishers
5. Shapiro, Edward., Macroeconomic Analysis,Golgotia Publications Pvt.Ltd., New Delhi
6. Blanchard Olivier & Fischer Stanley. Lectures on Macroeconomics. Cambridge: MIT Press,
7. Lewis M. K. and P.D.Mizen (2000)Monetary Economics, , 1st Edition, Oxford
8. Thorn, R.S. Edited (1976), "Monetary Theory and Policy" Praeger Publishers, New York

9. Levacic, R. and A. Rebman: Macroeconomics: An Introduction to Keynesian and Neo-Classical Controversies.

MEE 103: Energy Economics

Unit 1: Introduction to Energy Economics Energy and Multidimensional Interactions, Energy Basics, How Energy Is Defined, Alternative Classification of Energy, Introduction to Energy System, Energy Information, Energy Accounting Framework: Components of Energy Account, Commodity Accounts and Overall Energy Balance, Units, Conversion Factors and Aggregation of Energy Flow. Energy Resources and Energy Commodities; Properties of Energy Resources and Energy Commodities; Law Of Thermodynamics; Energy, economy and environment interactions, role of energy in development and growth.(9 Lectures)

Unit 2: The Increasing Global Demand for Energy, Causes and Impact of increase in Demand for Energy; World Energy Consumption Energy Consumption by End-use Sector (Buildings Sector, Industrial Sector, Transportation Sector), Global Variations in Energy Use; Understanding and analysing energy demand: evolution of demand analysis, overview of energy demand decision, economic foundation of energy demand, consumer demand for energy: utility maximization problem, demand models.(9 Lectures)

Unit 3: Energy Supply Analysis Classify energy on the basis of sources, renewable or non-renewable; worldwide energy supply by country; sources of energy supply, Fossil fuels (coal, oil, natural gas), economic theory of depletable resources, Trend and patterns of energy production; Social, Economic and Environmental Effects of Energy Production; Life Cycle of Energy Sources. Fossil fuel Supply Models, Supply Forecasting, Economics of Fossil fuel supply, Electricity, oil and gas, coal, strategiesfor modelling exhaustible resources, economics of energy generation such as power, coal, oil and gas, estimation of supply functions and cost functions.(9 Lectures)

Unit 4: Cost versus Return of Investment; Basic pricing model, Pricing Structure of different Energy sources such as short run and long run, peak and off peak, single part and two-part tariffs, Regulated vs market price, Average and Marginal cost pricing, ToD pricing, seasonal, and block pricing. (9 Lectures)

Unit 5: Energy taxes and subsidies: principles of optimal indirect taxation, equity considerations, issues related to numerical determination of a burden, Tax and subsidy structure in Indian Context, Energy pricing in Indian Context (Coal, Gas and Electricity), Different Energy Markets. (9 Lectures)

Case Studies of ONGC, NTPC, GAIL,.HINDALCO(Private thermal power plants)

Suggested Readings: -

1. SC Bhattacharya: Energy Economics
2. Banks: Energy Economics A Modern Introduction
3. Peter M. Schwarz: Energy Economics
4. CarolA.Dahl, International Energy Markets:UnderstandingPricing,PoliciesandProfits,Tulsa:Pennwell,2004

MEE 104: Environmental Economics

Unit1: Economy and Environment= Environment economy relationship-Laws of Thermodynamics and Material Balance Model, Environmental Kuznets Curve (EKC): Concepts and Genesis. Explanations of inverted-U shaped EKC-empirical evidence- N-shaped EKC.(8 Lectures)

Unit 2: Environmental Pollution as Economic Problem- Environmental Pollution as a Negative Externality (Pigou), the issue of Property Rights (Coase), Optimal Pollution (7 Lectures)

Unit 3: Pollution Control: Command and Control and Alternative Market Based Instruments- Command and Control measures; Pigouvian taxes and subsides, marketable pollution permits and mixed instruments (the charges and fees), Tradable pollution permits and international carbon tax, Coase' s bargaining solution and collective action; Hybrid Instruments- two-part tariff, double dividend hypothesis, illicit dumping. (10 Lectures)

Unit 4: Environmental Valuation- Basic issues of environmental valuation, Revealed Preference Approach- household production function, travel cost, Hedonic price; Stated Preference Approach-contingent valuation method. (10 Lectures)

Unit 5: Sustainable Development and Environmental Accounting- Concept of sustainable development- sustainable development rules and indicators measures of sustainable development, Sustainable accounting-economics of green accounting and sustainable resource management. Environment law: Carbon tax (vs cap and trade), its purpose and how it works, Control and Command (environmental economics), The Environment Protection Act (1986), Forest Conservation Act (1980), Indian Forest Act (1947), National Action Plan on Climate Change: its 8 missions. (10 Lectures)

Suggested Readings

1. Pearce,D.W. and Turner,R.K. (1991) : Economics of Natural Resources and the Environment, Hemel Hempstead, Harvester-Wheatsheaf.
2. Baumol, W.J. and Oates W.E. (1988) : Theory of Environmental Policy, 2nd Edition, Cambridge University Press.
3. Bhattacharyya, R.N. (2001): Environmental Economics: Indian Perspective, Oxford University Press.

4. Hanley,N., Shrogen J.F. and White B. (1997) : Environmental Economics in Theory and Practice, MacMillan.
5. Perman R.,Ma Y.,McGilvary, Jand Common, M (1999) : Natural Resources and Environmental Economics, 2nd Edition , PrenticeHall.
6. Freeman III, A.M. (1999) : The Measurement of Environmental and Resource Values : Theory and Methods, Resources for the Future, Washington D.C.
7. Kolstad, C.D. (2000): Environmental Economics, Oxford University Press. Bromley,
8. D.W. (1995): Handbook of Environmental Economics, Blackwell.

Articles

- Banerjee, S. (2001): "Economic Valuation of Environmental Benefits/Costs" in BhattacharyyaR.N. (ed) "EnvironmentalEconomics: Indian Perspective", Oxford University Press.
- Chakraborti, P. (2001): "Global Environmental Issues and Initiatives" in BhattacharyyaR.N. (ed) "Environmental Economics: Indian Perspective", Oxford University Press.
- Chichilinski, G. (1994): "North-South Trade and Global Environment", American Economic Review, 84(4):857-875.
- Chopra, K. (2004): "The Valuation of Biodiversity: The Case of Keoladeo National Park" in Kadekodi, G.(ed) "Environmental Economics in Practice: Case Studies from India", Oxford University Press.
- Dinda, S. (2004):"Environmental Kuznets Curve Hypothesis- A Survey",Ecological Economics,49 :431-455.
- Harrison,D. and D.L. Rubinfeld (1978) : " Hedonic Housing Price and the Demand for Clean Air", Journal of Environmental Economics and Management,5: 81-102.
- Markandya,A. and Murty, M.N.(2001) ; ' Measuring Non-user Benefit from Cleaning Ganges " in Markandya,A. and Murty, M.N " Cleaning up the Ganges :A Cost-Benefit Analysis of the Ganga Action Plan," Oxford University Press.
- Munasinghe, M. (1999):"Is Environmental Degradation an Inevitable Consequence of Economic Growth: Tunnelling through the EKC", Ecological Economics,29 :89-109.
- Sanyal, K. (2001) : "International Trade and the Environment" in Bhattacharyya R.N. (ed) "Environmental Economics : Indian Perspective" ,Oxford University Press.

MEE 105: Applied Statistics

Unit 1: Data type and Measurement, Graphical representation and Point estimate(8 Lectures)

Unit 2: Correlation and Regression Analysis Meaning And Linear and Nonlinear Correlation, Partial and Multiple Correlation Analysis, Properties of Correlation Coefficient, Regression Analysis: Meaning, basic concepts of Regression, Estimating function, Properties of Regression Coefficients/lines. (8 Lectures)

Unit 3: Sampling Distributions of Sample mean and variance, Planning of Sample Surveys - Methods of data collection, problem of sampling frame, sample size, choice of sampling design, pilot survey, processing of survey data, sampling andnon-samplingerrors, complex Sampling, Sources and treatment of non-sampling errors. Non –sampling bias and variance. (10 Lectures)

Unit 4: Probability and Random variables:Meaning of probability and types of events, Laws of probability-Addition, Multiplication, Bayes Theorem and Expected Value Theorem. - Applications. Random variables and their distributions. (10 Lectures)

Unit 5: Theoretical Distribution: Binomial, Poisson and Normal,ConceptofanEstimator: ConceptofanEstimatoranditsSamplingDistribution,PropertiesofgoodEstimator. (9 Lectures)

Selected Readings:

- Gupta,S.C and Kapoor,V.K(2005): Fundamentals of Mathematical Statistics (New Delhi, Sultan Chand & Sons)
- Patri Digambar and Patri D.N. (2005): Statistical Methods. (New Delhi: Kalyani Publishers)
- Mood, A.M., Graybill, F.A. and Boes, D.C.: Introduction to the Theory of Statistics.
- Hogg, R.V. and Craig, A.T.: Introduction to the Mathematical Statistics.
- Parzen, E.: Probability Theory and its applications.
- Goon A.M., Gupta M.K. and Dasgupta B.: Fundamental of Statistics, Vol. I.
- Kapoor V.K. and Saxena H.C.: Mathematical Statistics.
- M.R. Spiegel, Theory and Problems of Statistics, Schaum Series
- Gupta,S.C and Kapoor,V.K(2005): Fundamentals of Applied Statistics (New Delhi: Sultan Chand & Sons).
- Cochran, W.G: Sampling Techniques.
- Koutsoyiannis, A(2006): Theory of Econometrics
- Croxton, F.E., D.J. Cowden and S.Klein (1973): Applied General Statistics, Prentice Hall, new Delhi.
- Speigal M.R. (1992), Theory and Problems of Statistics, McGraw Hill Book London.
- S.P.Gupta: Statistical Methods
- A.M.Gun, M.k.Gupta AND B.Dasgupta: Fundamentals of Statistics

- S.C.Gupta and V.K.Kapoor: Fundamentals of Applied Statistics
- Schaum' outline: Introduction to Probability and Statistics

Semester-II

Course	Semester-II **Core Courses-05** **MOOCS Course-01**	Credit
MEE -201	Applied Econometrics	03
MEE -202	Natural Resource Economics	03
MEE -203	Economics of Green Energy	04
MEE -204	Research Methods	03
MEE -205	Evaluation of Mineral Resources	03
MEE -206	MOOCS/DSTCourse -Financial Modelling	02

Semester-II Core Paper

MEE201: Applied Econometrics

Unit 1: Model specification, Estimation of model, estimating functions, Evaluation of parameter estimates, Forecasting power of model, Desirable proportion of an econometric model. (9 Lectures)

Unit 2: Simple linear regression model, assumption of linear stochastic regression model, goodness of fit and R^2, Violation of assumptions of OLS Regression(multicollinearity, heteroscedasticity, autocorrelation), Simultaneity Bias. (9 Lectures)

Unit 3: Functional forms,Assumptions of Nonlinear Regression, its limitations and Numerical methods, Estimation of limited dependent variable: Logit and Probit, analysis of count data. (9 Lectures)

Unit 4: Time Series and Forecasting: Stochastic process, Unit root stochastic process, TS & DS stochastic process, integrated stochastic process, spurious regression, Test of stationarity: Graphical analysis, the unit root test – DF & ADF, ARIMA, Forecasting – Box – Jenkins (BJ) Methodology.(12 Lectures)

Unit 5: Evolution and Significance of Panel Data, Static and Dynamic Panel Data.(6 Lectures)

Reading List

1. D. Gujarati, Basic Econometrics, McGraw Hill
2. D. M. Nachane, Econometrics: Theoretical Foundations and Empirical Perspectives, Oxford University Press
3. Robert S. Pindyck& Daniel L. Rubinfeld, Econometric Methods and Economic Forecast
4. A Koutsoyiannis , Theory of Econometrics , Publisher: Ane Books; ISBN: 0333778227
5. J. Johnston, Econometric Methods, McGraw Hill
6. G. S. Maddala, Econometrics, McGraw Hill
7. R.G.D.Allen, Econometrics,
8. D. Gujarati, Essentials of Econometrics, Schaum Series
9. A.S. Goldberger, Introductory Econometrics, Harvard University Press, Cambridge

MEE 202: Natural ResourceEconomics

Unit 1: Introduction to Resource Economics:Meaning and importance of natural resource economics, classification of natural resource, Taxonomy of Natural Resources, Mc Kelvy's Resource Diagram, Resource Curse Hypothesis. Dimensions of Resource Scarcity, Physical and Economic Measures.(9 Lectures)

Unit 2: Capital Theoretic Approach to Economics of Natural Resources, Dynamic resource allocation problem, Maximum Principle, Discounting. (6 Lectures)

Unit 3: Economics of Exhaustible Resources: Basic concepts – Hotelling rule, The concept of backstop, A simple model of optimal depletion, Optimal extraction of an exhaustible resource.(9 Lectures)

Unit 4: Dynamic framework with optimal control- competitive and monopolistic models, Towards a backstop-exploration and technical progress, environmental cost and resource extraction.(9 Lectures)

Unit 5: Economics of Inexhaustible Resources: Economic Models in Renewable Resources. (6 Lectures)

Unit 6: Political Economy of Natural Resources: Corruption (Government monopoly over Natural resources), issue of displacement, compensation and Rehabilitation (6 Lectures)

Suggested Readings

1. Conrad, J.M.and C.W. Clark. 1987.Natural Resource Economics: Notes and Problems. Cambridge University Press, Cambridge.

2. Conrad, J.M: Resource Economics, Cambridge Univ. Press

3. Dasgupta,P.S.and G.M.Heal.1979.EconomicTheory and Exhaustible Resources. Cambridge University Press, Cambridge.

4. Hartwick, J.M.and N.D. Olewiler. 1998.The Economics of Natural Resource Use(2nd Edition). Addison Wesley, Reading, MA. Macmillan.

5. N.Hanley, J.Shogren and B.White: Environmental Economics in Theory and Practice,

6. Pearce, D and R K Turner: Economic of Natural Resources and the Environment, Prentice.

7. R.N.Bhattacharyya(Ed.):Environmental Economics

MEE 203: Economics of Green Energy

Unit 1: The rationale, Strategies and Planning for an inclusive green economy: Green Growth economy and green growth strategies, Rationale: Rethinking an economic paradigm, the rationale for embarking on the green transition, The 2030 Agenda and inclusive green economies, India's climate agenda and commitments, NAPCC, GHG inventory estimation, NDC and reporting(9 Lectures)

Unit 2: Understanding the New and Green Energy Sector, ESG, Renewable energy, The Renewable energy technologies, supply side and demand side Economics of renewable energy technologies, making green energy competitive ,Economic analysis of green energy investments, economics of small-scale decentralized renewable energy systems, Green energy pricing, and market: Green energy market, various pricing models and methods and structures.(9 Lectures)

Unit 3: Fiscal and financial instruments and incentives to promote green energy such as GBI, Feed in Tariff (FiT) and VGF etc. International regulatory mechanisms and frameworks guiding the green transition, Inclusive green economy initiatives around the world. International Development finance for an inclusive green economy, Enabling change agents through capacity development, Domestic regulatory regime for green energy and green building.(8 Lectures)

Unit 4: Renewable energy (Hydro, wind, solar, Geothermal, bio, Nuclear power); Indian Institutes and agencies: National Institute of Solar Energy, National Institute of WindEnergy, Indian Renewable Energy Development Agency, Solar Energy Corporation of India, Associations of renewable energy agencies of states. (9 Lectures)

Unit 5: Rural energy system inIndia, Mapping India's energy subsidies: Fossil fuels, renewables and electric vehicles, role of energy in the agriculture sector. GOBAR (Galvanizing Organic Bio-Agro Resources) DHAN scheme, 2018.(8 Lectures)

Case studies: Decarbonization of Indian Transport system (how transformation in Indian railways and transportation sector is taking place with reference to zero carbon emission). Case study of carbon footprints(2 Lectures)

Suggested Readings

1. Green Growth and Sustainable Development in India Towards The 2030 Development Agenda - Teri Report
2. Renewable Energy Technologies A Practical Guide For Beginners -Chetan Singh Solanki
3. Green Finances: Progress and Challenges - Article ByRBI
4. The Sustainable Development Agenda 2030: UNReport
5. Green Energy Finance in India Challenges And Solutions - By Gopal Sarangi - ABDIREPORT
6. Energy Transitions -The UnitedNations
7. Inclusive Green Growth - A Pathway to Sustainable Development byWorld Bank
8. Handbook On Green Growth By RogerFouquet.
9. Report on India's energy subsidies by VibhutiGarg, BalasubramanianViswanathan, DanwantNarayanaswamy, ChristopherBeaton, KarthikGanesan, ShrutiSharma, © 2020 The International Institute for Sustainable Development.
10. The food and agriculture organization of United Nations (chapter2, energy for agriculture):https://www.fao.org/3/x8054e/x8054e05.htm
13. Report on GOBAR scheme, government of India.
14. National energy policy report, Government of India.
15. Government reports on: National electric mobility mission plan, PM KUSUM YOJANA, development of solar parks and other related schemes.
16. S.C.Bhattacharya:Energy Security
17. India energy security by: Ligia Noronha and Anant Sudarshan

MEE 204: Research Methods

Section-I Research Methodology:

Unit 1: Research- Meaning & Types (Descriptive, Analytical etc.), Introduction to Philosophy of Research- The Research Onion. (5 Lectures)

Unit 2: Literature Review, Formulation of a Research Problem & Writing of a Research Synopsis: Research Design- Quantitative, Qualitative & Mixed and their various kinds, Hypothesis – Formulation (including Sources) & Types of hypotheses, Value neutrality of hypothesis. (10 Lectures)

Unit 3: Data Collection, Tools of Primary data collection- Questionnaire (Structured and Non-Structured) & Interview and their data entry and interpretation, (10 Lectures)

Unit 4: Question of Confirmation of a statement, Hypothesis Testing- Type I & Type II Errors, concept of Confidence, Confidence Interval, Limits and critical region, Test of significance for large and small samples –analysis of variance – one- and two-way classifications analysis & discussion, non-Parametric tests, Analysis of Results.(12 Lectures)

Section-II

Unit 5: Computer and its Application: Data Mining, Advance EXCEL, Statistical Softwares. (8 Lectures)

Suggested Readings

1. Kothari R.C. Research Methodology, Methods and Techniques, New AgeInternationalPublishers,IInd revised edition,reprint2008.
2. Cooper D.and Schindler P. Business Research Methods, TataMcGrawHill.
3. Don E. Ehridge Research Methodology in Applied Economics: Organizing, Planningand Conducting Economics Research, John Wiley and sons, April2004
4. JohnW.BestandJamesV.Kahn,ResearchinEducation. Goode and Heart, ResearchMethod
5. JerryW.Willis,FoundationsofQualitativeresearch:InterpretativeandCritical Approaches.Sage.
6. R.BogdanandS. Biklon;QualitativeResearchforEducation:AnIntroductiontoTheoryand Methods, Allyn andBecon
7. Chalmers; What is this thing Called Science: An Assessment of the Nature and Status of Science and its Method,Hackett.
8. J. Creswell; Qualitative Inquiry and research Design: Choosing among Five Traditions,Sage.
9. Flick Uwe; An Introduction to Qualitative Research,Sage.
10. Anselm Strauss and Juliet Corbin; Basics ofQualitative Research: Grounded Theory-Procedures and techniques, Sage.
11. Charles Teddlie and Abbas Tashakkori; Foundation of Mixed Methods Research,Integrating Quantitative and Qualitative Approaches in Social and Behavioural Sciences,Sage.

MEE 205: Evaluation of Mineral Resources

Unit 1: Mineral formation: Geological time scale, Formation of deposits (Igneous, sedimentary and metamorphous deposits), Identification of minerals, Competitive extraction, Monopoly extraction, socially optimal extraction, Extraction with capacity constraint, Extraction with exploration, Extraction with taxes.(9 Lectures)

Unit 2: Mineral Resources for Energy: Fossil fuels, classification of fossil energy resources: Coal, Petroleum (properties & grading), non-fossil energy resources, Uranium, Geographical location: World scenario and Indian scenario & Statistics of important mineral resources (coal, petroleum, uranium), Special features of mineral and mining industry, Conservation of minerals, National mineral policy.(9 Lectures)

Unit 3: Estimation of Mineral Reserves: Methods of sampling during exploration and mining, Concepts of Cut-off grade, and stripping ratio, Classification of resources: Estimation of reserves, Introduction to geostatistical ore reserve estimation. (9 Lectures)

Unit 4: Economic Evaluation: Break-even analysis, Economic appraisal of capital investments by NPV and IRR methods, Comparison of investment alternatives, Feasibility studies, Critical variables, price forecasting and sensitivity analysis, Global mineral marketing. (9 Lectures)

Unit 5: Mineral Economics: Special features of coal mining industry, Conservation of minerals, National mineral policy. (9 Lectures)

Suggested Readings

1. Conrad,J.M.andC.W.Clark.1987.NaturalResourceEconomics:NotesandProblems. Cambridge University Press,Cambridge.
2. Conrad,J. M : Resource Economics, Cambridge Univ.Press
3. Dasgupta,P.S.andG.M.Heal.1979.EconomicTheoryandExhaustibleResources. Cambridge University Press,Cambridge.
4. Hartwick,J.M.andN.D.Olewiler.1998.TheEconomicsofNaturalResourceUse(2nd Edition). Addison Wesley, Reading,MA.Macmillan.
5. N. Hanley, J. Shogren and B. White: Environmental Economics in Theory andPractice,
   Pearce,DandRKTurner:EconomicofNaturalResourcesandtheEnvironment,Prentice.
6. R.N. Bhattacharyya (Ed.): Environmental Economics,OUP

MEE 206:Financial Modelling

MOOCS/DST Course

Semester-III

Course	Semester-III **Core Course - 03** **Seminar Presentation - 01** **MOOCS Course-01**	Course
MEE -301	Operations Research	03
MEE -302	International Trade and Business in Energy	04
MEE -303	Energy Policies and law	04
MEE -304	Seminar Presentation on Internship Report	05
MEE -305	MOOCS/DST Course-Computation Skills	02

Semester-III Core Paper

MEE 301: Operations Research

Unit 1: Operations Research: Operational definitions of PERT/CPM Technique, Phases of OR, Models of Modelling in OR, OT techniques, Uses and limitations of OR. (8 Lectures)

Unit 2: Linear Programming: Problem formulation, Graphical Solution, Simplex Method, Duality, Concept of Input –Output Analysis.(9 Lectures)

Unit 3: Decision Theory: Basic Structure and Components of Decision, Decision Criteria, Decision Tree.(8 Lectures)

Unit 4: Game Theory: Theory of two person, Zero sum game, Mixed strategies, Theory of Two person, non-zero sum game, Solution method of game. Queuing Theory: Basic Characteristics, Queuing models: M/M/1 system, M/M/C system, M/Ek/1 System. (10 Lectures)

Unit 5: Sequencing Models: Classification, Assumptions, Sequencing Problem, n jobs through two machines 7 three machines Replacement, Maintenance and Reliability Problems: Failure rates, Reliability function, Hazard Rate, MTBF, Information Theory – Entropy- A Measure of Uncertainty. (10 Lectures)

Suggested Readings

1. Vohra, N.D.; Quantitative Techniques in Management; Tata McGraw HillPublishingCompany Ltd., NewDelhi.
2. Wanger, H.M., Principles of Operation Research with Applications to Managerial Decision, Prentice Hall of India, NewDelhi.
3. Levin, R. I. and Kirkpatrick, C.A., Quantitative Approaches to Management, McGraw-Hill. Hardy, A. Taha, Operations Research – An Introduction, Macmillan Publishing Co., New York.

4. Harper, W.M., Operations Research, ELBS,London.
5. Hilier, F.S. & Lieberman, G.J., Introduction to Operations Research, Holden Day Inc. San Francisco.
6. Hartley, R.V., Operation Research: A Managerial Emphasis, Good Year PublishingCompany, California.

MEE 302: International Trade and Business in Energy

Unit1: Global Scenario of Energy: Energy consumption in various sectors and its changing patterns. The future energy security and market behaviour, Global demand and supply outlook, Energy needs and demand of developing countries. Energy and climate nexus, Climate commitments and energy implications.(6 Lectures)

Unit 2: Challenges for International Trade in Energy: Unequal distribution of energy resources, Issues related to restrictive practices of energy exporting countries; Energy dual pricing policies, Period of high oil prices;1973-85 and post COVID, Increasing Global Competition, Import Dependence.(9 Lectures)

Unit 3: Models of the Oil Market: Competitive Models: Property Rights Model (Nationalization), Supply Shocks Model, Target Revenue Model. Non-Competitive Models: OPEC Cartel, Oligopoly Model. Market for coal and issues around coal import and export. International trading and market around gas. Energy security related challenges around gas.(10 Lectures)

Unit 4: International Business Environment- Global Trade; Foreign Direct Investment; National and Regional Competitiveness; Regional Economic Integration; Global Growth Generators (Emerging economies); Intellectual property rights. (8 Lectures)

Unit 5: Trade in oil, gas and electricity; Challenges in Trade in oil, gas and electricity: Infrastructure and construction of transportation pipe lines, Transmission grid. Global initiatives taken around renewable energy such as OSOG, ISA and other initiatives, WTO and energy and climate change related issues. Climate change commitments and energy issues in global declarations such as carbon trading (voluntary and mandatory), energy, climate change and SDGs etc. (10 Lectures)

Case Studies: (i) Drivers of crude prices and product prices and(ii) Pricing benchmark methodologies - Case study of Platts (2 Lectures)

Suggested Readings

1. Andre Mornier(2008):“Setting the Rules of Energy Trade” In Fundamentals of the Global Oil and Gas Industry. London: Petroleum Economists.
2. AlainVerbeke;InternationalBusinessStrategy
3. Adelman, M. A. (1982) “OPEC as a Cartel.”in J. M. Griffin and D.J. Teece, OPEC

Behavior and World Oil Prices, London: George Allen &Unwin

4. Adelman, M. A. (1986) “Scarcity and World Oil Prices.” Review of Economicsand Statistics.
5. Alhajji, A. and Huettner, D. (2000b) “OPEC and World Crude Oil Markets From 1973 to 1994: Cartel, Oligopoly, or Competitive?” Energy Journal,21(3).
6. Alhajji, A. and Huettner, D. (2000c) “The Target Revenue Model and the International Oil Market: Empirical Evidence from 1971 to 1994.” Energy Journal,21(2).
7. AlsmillerR.G.andHorwedelJ. E. (1985) “AModeloftheWorldOilMarketwithanOPEC Cartel.” Energy, 10(10).
8. Baldwin N.and Prosser R. (1988): “World Oil MarketSimulation.” InSterner T., International Energy Economics. Chapman &Hall.
9. Bob De Wit & Ron Meyer; Strategy: An International Perspective. Cavusgil; International Business.
10. Carl Nelson; Import/Export: How toTakeYour Business across Borders.
11. Michael Kennedy(1974):An Economic Model of the World Oil Market, The Bell JournalofEconomics and Management Science, Vol. 5, No. 2 , Published by: RAND Corporation.
12. Pankaj Ghemawat: RedefiningGlobal Strategy: Crossing BordersinaWorldwhere Differences Still Matter.
13. SRaghunath&ElizabethL.Ross;InternationalBusinessStrategy:Perspectiveson Implementation in Emerging markets.
14. Statement of the Energy Charter Secretariat at the Council for Trade in Services, WTO, 11, February,2010.
15. Tarun Khanna &Krishna G. Palepu: Winning in Emerging Markets:Road Map for Strategy and Execution.
16. The Energy and Resources Institute (TERI) Energy Data Year Books International Energy Agency,WorldEnergy Outlook,Executive Summary.
17. YuliaSelivanova(2007): “The WTO and Energy. WTO Rules and Agreements of Relevance to the Energy Sector, Trade and Sustainable Energy Series, ICTSD Programme on Trade and Environment, International Centre for Trade and Sustainable Development .
18. YuliaSelivanova(2004) “WorldTrade Organization Rules and Energy Pricing: Russia’ s Case, 38 Journal of World Trade 4(2004)
19. YuliaSelivanova(2008): “Energy Dual Pricing in WTO Law, Analysis and Prospects in the Context of Russia’s Accession to the WTO.” Cameron.

20. https://www.eia.gov/finance/markets/crudeoil/
21. https://www.eia.gov/finance/markets/products/
22. https://www.spglobal.com/commodityinsights/en/our-methodology/methodology-specifications
23. https://www.bp.com/en/global/corporate/energy-economics/energy-outlook.html
24. https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html
25. https://www.shell.com/energy-and-innovation/the-energy-future/scenarios.html

MEE 303: Energy Policies and Law

Unit 1: Energy Policies: Commercial mining of coal in India, Single -Window clearance process, National Auto Fuelpolicy, National Policy on Biofuels and its Development, Waste Management Policy, Zero liquid discharge, Water Regulation Act, India Atomic energy development and policy, EnergyProduction, Consumption policy (Which type, how much, Where), Annual strategy of energy transition under the mandate of the Committee. Energy (and power) policies in the country, tariffs and subsidies, energy utility interface, private sector participation in power generation, energy and development, National energy plan, role of modelling in energy policy analysis, energy investment planning and Energy pricing.(8 Lectures)

Unit 2: Energy Law : The energy law and policy triangle , International and National Energy Law, and its policy drivers , what causes influence on them. , Law related to different Energy sectors (oil , gas and electricity) ,IPR , Policies for renewable energy transition ,Energy charter treaty and protocol on energy efficiency, The Aarhus convention, Land acquisition law, Different advisory bodies related to energy (CEA), Agreement vs Contract.(10 Lectures)

Unit 3: An Introduction to Indian Energy Policy, Electricity Act, National Tariff Policy, National Action Plan on Climate Change, National RE Policy, National Solar Missions, Wind Power, Regulatory Commissions, Grid Code, Green Corridor, Solar Parks, Hybrid Parks, Repowering, Offshore, Scheduling and Forecasting, Electricity Trading, Open Access, RPO Distributed Generation Regional Grid in the South Asian Region. Electrification and off grid status/scenario in India Scenario evolving with competitive bidding Overview of Global RE Sector, DDG scheme under Rajiv Gandhi Grameen Vidyut Karan Yojana (RGGVY) Remote Village Electrification Program Village Energy Security Programme (VESP) Off grid programme under JNNSM KUSUM Scheme, RTS schemes, Energy Conservation Act (2001), the National Green Tribunal act (2010). UNFCCC, Biodiversity Protection.(9 Lectures)

Unit 4: Institutions, Organisations, Laws and Policies: Constitutional provisioning of energy, Role of national level Organisations and institutions such as MNRE, MoP, Ministry of Coal, CERC, CEA, FoR, NLDC, CTU and other committees and associations Role of state level organisations and entities such as state level ministries and departments, SERCs, DISCOMs and other Statutory bodies such as SLDC, RLDC, State Nodal Agencies 9NDAs) etc. Policies and regulations such as The Electricity Act, NAPCC, National Energy Policy - NITI AYOG, various programmes and schemes Jawaharlal Nehru National Solar Mission, Promotion of energy efficient led bulbs (UJALA SCHEME),Ujjwala Yojana, KUSUM scheme, SHAKTI Scheme etc. Biofuels as an alternative to energy sources: National Biofuel Policy (2018), PM JI-VAN Yojana (2019). (10 Lectures)

Unit 5: Politics and Economics of International Energy, Climate change politics: International Agreements: The United Nations Framework Convention on Climate Change and Kyoto Protocol, Policy Mechanisms to address climate change Beyond Kyoto, COP 21 and aftermath. Energy Charter Treaty (ECT): International Energy Agency; Global Conventions on Renewable Energy.(8 Lectures)

Suggested Readings

1. Policies: Government websites
2. Energy law and the environment: RosemaryLyster , Adrian Bradbrook
3. Environment and energy law: Karen E. Makuch , Ricardo Pereira
4. Energy law: an introduction by Raphael J.Heffron
5. Natural resource and Environment Economics: Roger Perman

MEE 304: Seminar Presentation on Internship Report

There will be Programme of Summer Internship for a period of 6 to 8 weeks.Its time period will be after Second Semester Exam till the beginning of Sem-III.Summer Internship will be compulsory for all the students.Students will complete their Internship before Semester III. During Semester they will prepare their Internship Report and submit it before the start of Theory Exams of Semester III. Seminar Presentation of Internship Report will be after the completion of Theory Exams of Semester III.

Internship Report submitted by the students would be evaluated by the Board of InternalExaminers constituted by the Policy Planning Committee of the Department.It would be mandatory for every student to do Internship on any of the areas of Energy chosen by him/ her in any Public/Private company or Energy Consultancy firms/Research agency/Institution.

InternshipReport will be presented before the open house consisting of students and panel of Internal and Externalteachers.There would be weightage of 60:40 marks on Evaluation and Seminar presentation of Internship Report respectively.

MEE -305: MOOCS/DST Course: Computation Skills

Semester-IV

Course	Semester-IV Core Course - 02 Field Work/Dissertation & Viva- Voce – 01	Credit
MEE -401	Project Evaluation	03
MEE -402	Energy Efficiency and Audit	03
MEE -403	Field Work/Project Work/ Dissertation	06

Semester-IV Core Paper

MEE401: Project Evaluation

Unit 1: Project Organization-structure and establishing the Organizational Breakdown Structure (OBS) for the project. Through an analysis of the project information-transfer needs (i.e., who needs information from whom), project teams and a reporting structure may be determined. Specifically, several product developments processes and the Design Structure Matrix are studied.(9 Lectures)

Unit 2: Project Planning: Work Breakdown Structure and mapping this structure to the established OBS. Furthermore, a project budget and Cost Breakdown Structure are developed and mapped to the OBS and WBS. The planning phase also includes establishing an appropriate timeline for the project in the context of resource constraints. Finally, the project manager must acknowledge that very few (if any) of the estimates and predictions at hand will prove to be accurate in the future; she needs to account for risk factors and their possible consequences on the schedule, budget, quality and environment while planning a project. Specific methodologies for planning include: The Critical Path Method (CPM) The Precedence Diagramming Method (PDM) The program Evaluation and Review Technique (PERT). (9 Lectures)

Unit 3: Project Management- Comparison of PERT/CPM, Assumptions of PERT/CPM, Algorithm, Network Analysis, Fundamentals of Network model, three estimate approach of PERT, Resource Levelling and Time cost Trade-off Analysis. Inventory Control Model: Deterministic Inventory Control Model Simulation Techniques: Operational Definitions, The nature of simulation: Systems, Models and Simulation, Motivation, Limitation and Pitfalls: Monte Carlo Simulation Technique. (9 Lectures)

Unit 4: Project Monitoring refers to the configuration and metrics used to monitor the progress of a project throughout its life. Particular questions of interest to the project manager are: (a) Is the project progressing according to the schedule? (b) Will the project be completed within the allocated budget? (c) Will the product perform as

expected? (d) If there are any deviations in schedule, budget or quality, how efficiently and how fast are they captured, reported and acted upon? (9 Lectures)

Unit 5: Project Control and Project Learning

The Project Control section of the course describes techniques to help realign projects that have gone awry. Corrective action may be needed in many areas such as project scope, product performance, project schedule, and project budget. Project Control also requires a clear trace as to when and how changes are made to baselines as well as a clear understanding and documentation of project configurations.

Project Learning: is recognized by organizations as one of the most important factors for success in current and future projects. Through life-cycle and post-mortem analysis, the project manager may identify areas to be emphasized or more closely manages in future projects. Such areas are: Resource allocation. Risk and uncertainty. Budget constraints. Project feasibility and Project time and cost management. Crashing of a project.(9 Lectures)

MEE402: Energy Efficiency and Audit

Unit 1: Energy Efficiency: Energy Efficiency and Energy Conservation; Energy efficiency vs economic efficiency, market-based incentives for energy efficiency, Economics of Energy efficiency improvements. (9 Lectures)

Unit 2l: Technology in Energy, Strategic R&D management and Technological Consortia; Licensing and joint Ventures, Managing Technology Spill overs; Justification of new technology; management accounting and technology; Integration of New with Old technology, Assimilation of Technology. (9 Lectures)

Unit 3: Bureau of energy efficiency: its 6 flagship programmers' ECBE, STARLABEL, PAT, SME, DSM, And SDA. , National Mission for Enhanced Energy Efficiency, market transformation for energy efficiency, energy efficiency financing platform , Framework for Energy Efficient Economic Development (FEEED), barriers to energy efficiency, Future of Energy Service Companies (ESCOs). Indian energy Exchanges and its products: Renewable Energy Certificates, Energy Saving Certificates.(9 Lectures)

Unit 4: Energy Audit: Energy Audit Concepts, Elements, measurements, mass and energy balances, evaluation of energy conserving opportunities. Presentation of reports, discounted cash flow, present value concept, annual investments and rate of return. (9 Lectures)

Unit 5: Energy Management: Fossil fuels and combustion, combustion calculation, emissions to air, energy accounting, pollution accounting, energy uses and options for improvement.(9 Lectures)

Case studies: Energy efficiency in MSMEs,agriculture, municipality. Case studies on Energy Auditing, Case Study of financial behaviour of oil and gas companies using Energy Information Administration (EIA) Financial Review

Suggested Readings

1. Paul W. O'Callaghan, Integrated Environmental Management Hand Book, John Wiley & Sons, Chichester,1996.
2. Paul W. O'Callaghan, Energy Management: A comprehensive guide to reducing costs by efficient energy use, McGraw Hill Book Company, London,1993.
3. HarolW.Henry, FredricW.Symondsetc,EnergyManagement:TheoryandPractice,Marcel
4. Dekker, Inc., New York, 1980.
5. HirenSarkarandGopalK.Kadekodi,EnergypricinginIndia:perspectives,issuesandoptions, 1988.
6. S. C.Bhattacharya: Energy Economics Bureau of energy efficiency government website Indian energy exchangeportal.
7. *Michael E. Porter; Competitive Strategy: Techniques for Analyzing Industries &*Competitors.
8. https://www.eia.gov/finance/markets/crudeoil/
9. https://www.eia.gov/finance/markets/products/
10. https://www.spglobal.com/commodityinsights/en/our-methodology /methodology - specifications
11. https://www.bp.com/en/global/corporate/energy-economics/energy-outlook.html
12. https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html
13. https://www.shell.com/energy-and-innovation/the-energy-future/scenarios.html

MEE403: Field Work/Project Work/ Dissertation

The objective of this paper would be to expose the students pursuing MA Economics (Energy Economics) to the real world outside and develop their writing and presentation skills. The students would be therefore required to do field work and submit a dissertation/project report. The paper would be divided into two components-

a. **Part-'A'- 60 Marks** – This would consist of doing a field survey and project work and Writing Dissertation/Project Report. Dissertation/Project Report submitted by the students would be evaluated by the Board of Internal Examiners constituted by the Policy Planning Committee of the Department. It would be mandatory for every student to carryout field study related to the topic chosen by him/ her for the dissertation/project work.

b. **Part-'B'- 40 Marks**-This would consist of presentation of project report and Viva voce by external examiners, fifty percent of which would give weight to the field work conducted by the students and fifty percent to the dissertation/project report submitted.