

**[M- Group: Mechanical Engineering, Civil Engineering, Metallurgy & Materials
Science, Production Engineering and Industrial Management]**

Semester I

Sr. No.	Course Type	Course Code	Course Name	Teaching Scheme			Credits
				L	T	P	
1	PCC1	PL-19001	Fundamentals of Urban and Regional Planning	3	0	0	3
2	PCC2	PL-19002	Demography and Urbanization	3	0	0	3
3	PCC3	PL-19003	Evolution of Aesthetics, Culture and Technology	3	0	0	3
4	ESC1	MA-19004	Statistical Techniques	2	1	0	3
5	IFC1	PL(IF)-19001	Building Materials and Construction Technology	3	0	0	3
6	LC1	PL-19004	Planning and Design Studio-I (Graphics and Presentation techniques)	0	0	10	4
				14	1	10	19
			Total Academic Engagement and Credits	25			19

[PL-19001] Fundamentals of Urban and Regional Planning		Credits:3
Teaching Scheme	Examination Scheme	
Lectures: 3 Hrs/week	T1 - 20 Marks	
	T2 - 20 Marks	
	End Sem- 60 Marks	

Course Outcomes:

Students will be able to

- a. Understand importance of Urban and Regional Planning.
- b. Learn various definitions of planning, various sources of planning knowledge and various forms of planning knowledge.
- c. Learn about development plan and development control regulations also various guidelines and various land uses.
- d. Learn basics of governance in planning and Global cities and its characters.
- e. Learn fundamentals of Planning Theories and various theories of Urbanization.

Unit 1: Definitions and Rationales of Planning **(6 Hrs)**

Various definitions of town and country planning; Goals and objectives of planning; Components of planning; Benefits of planning; Arguments for and against planning

Unit 2: Foundations of Planning **(6 Hrs)**

Orthodoxies of planning including the Lamps of Planning; Sustainability and rationality in planning; Components of sustainable urban and regional development; Defining what counts as planning knowledge: various sources of planning knowledge, various forms of planning knowledge; Reasoning and its various forms in planning; Space, place and location

Unit 3: Development Plans and Development Regulations, Zoning Regulations **(6 Hrs)**

Definition of development plan; Types of development plans: master plan, city development plan, structure plan, district plan, action area plan, subject plan, town planning scheme, regional plan, sub-regional plan; Planning Advisory Group report and the URDPFI Guidelines; Sector plans and spatial plans; Defining development and development control regulations, types of development control; Implications of violations of development control regulations; Conforming and Nonconforming land uses; Compatible and non-compatible land uses, LULU and NIMBY

Unit 4: Governance of Planning **(6 Hrs)**

Local government in India; District Planning Committees and Metropolitan Planning Committees; Introduction to Internationalization and globalization of planning: meanings and forms of globalization; Characteristics of a global city; Principles for planning for a global city

Unit 5: Theories of Urbanization **(6 Hrs)**

Theories of urbanization including Concentric Zone Theory; Sector Theory; Multiple Nuclei Theory and other latest theories; Land Use and Land Value Theory of William

Alonso; City as an organism: a physical entity, social entity and political entity.

References:

- Faludi, A. A Reader in Planning Theory - Pergamon Press, Oxford.
- Faludi, A. Planning Theory - Pergamon Press, Oxford.
- Keeble, L. Principles and Practice of Town - The Estate Gazette, London Town and Country Planning
- McLoughlin, J.B. Urban and Regional Planning: - Faber and Faber, London. A System Approach
- McLoughlin, J.B. Control and Urban Planning - Faber and Faber, London.
- Hall, P. Urban and Regional Planning Fourth Routledge, London.
- Freidmann, J. Planning in the Public Domain - Princeton University Press, Princeton.
- Fainstein, S.S. and Readings in Planning Theory - Mackwell. Campbell, S.

[PL-19002]Demography and Urbanization		Credits:3
Teaching Scheme	Examination Schemes	
Lectures: 3 Hrs/week	T1 - 20 Marks T2 - 20 Marks	
	End Sem- 60 Marks	

Course Outcomes:

Students will be

- acquainted with the different data sources.
- able to analyse data from different sources and their relation with planning processes.
- aware of present policies and strategies for directing urbanization trends.

Unit 1: Study of Population

(7 Hrs)

Demographic variables: fertility, mortality, migration; evolution of population study, contribution of Malthus; mortality-trends, biological and social factors and mortality-gender, race, social structure, life style, social status, occupation etc; measures of mortality-crude and age-specific death rates; infant mortality, adjusted or standardized death rates; neonatal mortality rate; fertility trends, fertility and social and biological behaviour; differential fertility, ethnic groups, socio-economical group mobility, location etc.; measures of fertility, crude birth rate; Age-specific fertility rate; total fertility rate, net reproduction rate; migration-causes and consequences of population movement; reasons and types of migration trends; methods of measuring volumes of migration; direct and indirect measures; effect of migration of composition of population.

Unit 2: Study of Demography

(7 Hrs)

Source of demographic data; Census of India and its role as a data warehouse; population structure and composition - age sex composition, sex ratio, dependency ratio, child-woman ratio; measures of age-sex structure, age-sex pyramid, population composition; marital status, caste, region , literacy level, etc; life table techniques; techniques in preparing life table, abridged life table; population estimation, projection and population forecasting; basic cohorts survival model, inter regional cohorts survival model.

Unit 3: Urbanization in India

(7 Hrs)

A brief history of urbanization in India; Mughal and British influences of India cities; post independence urbanization; urbanization process as influenced by socio-cultural, political, economic and administrative factors; definition of urban centers, concepts

of rural-urban continuum and dichotomy; census definition of urban places town, cities, town groups, urban agglomeration, standard urban area metropolis, megalopolis, etc; functional classification of urban places.

Unit 4: Settlement Systems and Role of Urban Area

(7 Hrs)

Settlement system, senses classification of settlements, primate city, rank-size rule, central place concept, concepts of complementary area, central goods and services, range, threshold, etc; city-region relationship; structure of city regions, area of influence, dominance; rural-urban fringes; its structure, stages of growth, its role in urban growth; urbanization, industrialization and urban development; push and pull factors; migration trends and impacts on urban and rural development

Unit 5: Policies and Strategies for Directing Urbanization Trends in India

(8 Hrs)

Over view of world urbanization, Urbanization policies (States), basic issues in urbanization policy; role of national and state level policies; five year plans, latest attempts at urbanization policy formulation in the country; salient features of the report of the National Commission of Urbanization.

References:

- Agarwala, S. N. (1972), India's Population Problem, Tata McGraw Hill Co., Bombay.
- Bose, A. (1996), India's Basic Demographic Statistics, B. R. Publishing Corporation, New Delhi.
- Bogue, D. J. (1971), Principles of Demography, John Wiley, New York.

[PL-19003] Evolution of Aesthetics, Culture and Technology		Credits:3
Teaching Scheme	Examination Schemes	
Lectures: 3 Hrs/week	T1 - 20 Marks T2 - 20 Marks	
	End Sem- 60 Marks	

Course Outcomes:

Students will be able to understand

- a. Social aspects and broad inclinations of our history from spatio-temporal planning evolution.
- b. Lessons imparted by historic men of war in terms of evolutionary cycle.
- c. Planning evolution which led to complex theories of planning in India and Abroad.

Unit 1: Fundamentals of Arts

(4 Hrs)

Importance of Creative, Visual Arts. Art as a medium of Communication and Social Expression. Human Habitat as an artistic expression. Classification of various Art forms as per global location and time frame. Importance of Creativity and Interdisciplinary Symbiotic relation with other disciplines of Art forms. Art as a Communicative system/Theory of Communication. The fundamentals of Art / Principles of Art and its relation with City Planning. Various Ism's and their relation with evolution of Culture and Art

Unit 2: Fundamentals of Aesthetics

(3 Hrs)

Concepts of beauty and ugliness, classical theories of aesthetics; relationship of aesthetics with other cultural values, concepts of scale, space, form and structure; concepts of time as a dimension of built form; Role of climate in evolution of settlement form.

Unit 3: Role of Culture and Technology in Planning

(8 Hrs)

Definition and symbols of culture; Transmission of culture; Cultural traits of ethnic groups and their expression in built form; Aesthetics of mixed culture and global culture; Cultural pollution; Role of technology in changing arts, culture, aesthetics,

built form and structure of human habitat. Book Review of “The culture of Cities” by Lewis Mumford.

Unit 4: Aesthetics, Culture and Technology in India

(12 Hrs)

Aesthetics, culture and advancement of technology in ancient India and their impact on planning of settlements; planning principles of the Manasara Treatise and Indus Valley Civilization. Aesthetics, culture and advancement of technology during the Mughal and British periods and their impact on planning of human settlements; Aesthetics, culture and advancement of technology in independent India and their impact on planning of human settlements.

Unit 5: Asian, European and American Aesthetics, Culture and Technology

(10 Hrs)

Evolution of aesthetics, culture and technology in Europe and North America and their impact on city planning principles; Greek cities, Roman cities, European medieval cities; Planning during Renaissance and Baroque period. Evolution of aesthetics, culture and technology and their impact on city planning principles in America, Africa, Asia, the Middle East.

References:

- Culture Urbanism and Planning by Javer Monclus. Ashgate Publishing Limited, England 2006
- The culture of cities by Lewis Mumford. Routledge, New York. 2006
- History of Architecture in all countries by James Fergusan. 2010
- Hints of Self Culture by Lala Hardayal. Javes Publication, 1960

[MA-19004]Statistical Techniques		Credits:3
Teaching Scheme	Examination Scheme	
Lectures: 2 Hrs/week	T1 - 20 Marks	
Tutorial : 1Hr/week	T2 - 20 Marks	
	End Sem- 60 Marks	

Course Outcomes:

Students will be able to

- a. apply the Statistical and Quantitative Techniques in various planning studios
- b. analyse data collected from field and to draw conclusions with the help of various statistical tools.
- c. do forecasting of future trends and Hypothesis Testing

Unit 1: Organizing Data

(8 Hrs)

Collection, classification and tabulation of data; Diagrammatic and graphic representation of data

Unit 2: Measures of Central Tendency and Dispersion

(8 Hrs)

Simple and weighted mean mode, median, harmonic and geometric mean; Variance and standard deviation; Coefficient of variation

Unit 3: Sampling

(6 Hrs)

Statistic and parameters; Types of sampling; Different types of random sampling; Sample size; Sample size and standard error

Unit 4: Index Number

(6 Hrs)

Construction of index number: simple and weighted index; Factor reversal test and time reversal test; Cost of living index number

Text Books :

- Statistical Methods by S.P. Gupta, Sultan Chand and Sons, (Latest Edition)

References:

- Problems and Solutions in Statistics by V.K. Kapoor and S.C. Gupta. Sultan Chand Publications
- Applied Statistics by V.K. Kapoor. Sultan Chand Publications
- Theory and Problems of Statistics- Schuan Series by M.R. Spiesel. MC. Graw Hill Publications
- Fundamental of Statistics by S.K. Gupta. Himalaya Publications
- Statistics of Management by Rubin Levin. Prentice Hall Publications
- The practice of Business Statistics by Manish Sharma and Amit Gupta, Khanna Publishing Company Private Limited, New Delhi.

[PL(IF)-19001]Building Materials and Construction Technology		Credits:3
Teaching Scheme	Examination Schemes	
Lectures: 3 Hrs/week	T1 - 20 Marks	
	T2 - 20 Marks	
	End Sem- 60 Marks	

Course Outcomes:**Students will be able to**

- differentiate the basic building materials and finishes
- envisage the idea of building construction and building element.
- get awareness of principles of Site Development, and Service Lines and Networks
- realize the phenomenon of compression & tension
- realize the Design Principles of Column, Beam & Foundation

Unit 1: Introduction to Building Materials and Finishes**(8 Hrs)**

Brick, timber, stone, cement, lime, glass, R.C.C., asbestos, paints and varnishes, Fibre Reinforced Plastic (FRP), Structural Uses of Timber for lintels, post and trusses.

Unit 2: Principles of Construction and Building Elements**(8 Hrs)**

Foundations, Footings, D.P.C., flooring, sills, lintel, roofing, parapets, coping, cladding expansion joints, external wall sections with details, beams, columns, slabs, retaining walls, etc

Unit 3: Principles of Site Development and Service Lines and Networks**(8 Hrs)**

Principles and components of site-development, setting out of buildings on site, Layout and construction of roads, culverts, flyovers, sewer and storm water drain, water supplylines, service duct under the road

Unit 4: Compression and Tension**(6 Hrs)**

Forces of compression and tension, concept of equilibrium forces and conditions of equilibrium, Hooke's law, stress – strain relationship of tension and compression

Unit 5: Design Principles Column, Beam & Foundation**(6 Hrs)**

Beams, types and bending, Types of slabs, Column - short and long columns, spacing of columns, Design principles of RCC beams and slabs. Construction system: reinforced concrete.

References:

- Handbook of civil Engineering by R.N. Khanna, Engineer Publisher, New Delhi
- Building Construction by Sushil Kumar. Standars Publisher Distributer, NaiSarak
- Building Construction by W.B. Mckay. Orient Longman Pvt Ltd. Mumbai

- Principles of Building Drawings by M.G. Shah and C.M. Kale. Mac Millan India Ltd
- Fundamentals of Building construction: Material and Methods by Edward Allen and JosphIans, John Wiley and Sons, 2008

[PL-19004]Planning & Design Studio-I(Graphics and Presentation techniques) Credits:4	
Teaching Scheme	Examination Schemes
Practical: 10 Hrs/week	T1 - 20 Marks T2 - 20 Marks
	End Sem- 60 Marks

Course Outcomes:

Students will be able to

- apply concepts of building design in various architectural and planning projects
- gain the architecture outlook in solving planning problems
- learn presentation techniques that will help in various planning project

Unit 1: Drawing Equipment and Mediums

Introduction to drawing equipment and mediums, Importance of graphics and visual presentations;

Unit 2: Shapes and Forms

Use of points, lines, polygons; Horizontal, vertical, diagonal, curved lines; Line thicknesses and intensities; Texture, colour and tone in materials and graphics; Shapes and forms;

Unit 3: Concepts of Scales and Proportions

Sketching of human figures, activities, natural and man-made elements; Concept of scales and proportions; Graphic scales; Free hand lettering; Jali patterns;

Unit 4: Perspective Projections

Orthographic, isometric and perspective projections of one, two and three dimensional objects;

Unit 5: Appreciation and Presentation

Appreciation and design of Logo and Insignia of geometric merits and format of presentation drawings

References:

- Architectural Drafting and Design by Alan Jeffris and David A. Madsen. ThomansDeimer Learning, NY, 5th Edition
- Rendering with Pen and Ink by Robert W. Gill. Thames and Hudson- Revised Edition
- Graphics for Urban Design by Bally Meeda, Neil Parkyn and David Stuart Watson- Thomas Telford, Publishing London, 1979

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Science, Production Engineering and Industrial Management]**

Semester II

Sr. No.	Course Type	Course Code	Course Name	Teaching Scheme			Credits
				L	T	P	
1	PCC1	PL-19005	Surveying Techniques	3	0	0	3
2	PCC2	PL-19006	Planning Techniques	3	0	0	3
3	PCC3	PL-19007	Infrastructure Planning	3	0	0	3
4	PCC4	PL-19008	Rural Planning and Development	3	0	0	3
5	ESC2	MA-19005	Quantitative and Qualitative Techniques	2	1	0	3
6	LC2	PL-19009	Planning and Design Studio-II (Area Appreciation)	0	0	10	4
7	LC3	PL-19010	Surveying Lab	0	0	4	2
8	HSMC	HS-19001	Effective Communication Skills	0	0	2	1
9	HSMC	HS-19002	Design Thinking	0	0	2	1
				14	1	18	23
			Total Academic Engagement and Credits	33			23

[PL-19005] Surveying Techniques		Credits:3
Teaching Scheme	Examination Schemes	
Lectures: 3 Hrs/week	T1 - 20 Marks T2 - 20 Marks	
	End Sem- 60 Marks	

Course outcomes:

Students will be able to

- a. recall the units, scales and symbols in surveying
- b. carry out surveying exercise
- c. undertake levelling exercise
- d. locate contour and appreciate the topography of a settlement using GPS in documenting spatial attributes of any location

Unit 1: Introduction to Surveying

(6 Hrs)

Basic principles of surveying; Measurement units, concepts of scales and conventional symbols; Stages in surveying; Concept of trigonometry; Traversing and tacheometry in surveying; Errors in surveying

Unit 2: Primary Surveying Techniques

(6 Hrs)

Chain surveying: principles and equipment; Obstacles and errors in chaining; Types of ranging; Errors and field application Compass surveying: types of compasses; Concept of bearing, magnetic declination; Effects of local attraction; Errors and field application

Unit 3: Conventional Surveying Techniques

(6 Hrs)

Plane table surveying: accessories, methods, advantages & disadvantages; Errors; Field application Theodolite surveying: an overview Tachometric surveying: an overview

Unit 4: Contouring & Levelling

(6 Hrs)

Contouring: concept and characteristics; Methods of locating contours; Uses of contour maps Levelling: definitions, methods, types of levelling instruments; Temporary and permanent adjustments of level; Theory of direct, differential and reciprocal levelling; Longitudinal sectioning; Cross-sectioning; Errors in levelling; Field application

Unit 5: Advanced Surveying Techniques

(6 Hrs)

Introduction to total station survey and application on field; Introduction to GPS and application on field; Introduction to digital theodolite and application on field; advantages & disadvantages of advanced surveying equipment.

References:

- Surveying (Volume I and II) by B.C. Purnia, Laxmi Publications, Delhi, 2005
- Advanced Surveying: Total Station and Remote Sensing. Pearson Publishers- 2007
- Digital Photogrammetry by Wilfried Linder. Springer Publishers 2008

[PL-19006] Planning Techniques		Credits:3
Teaching Scheme	Examination Schemes	
Lectures: 3 Hrs/week	T1 - 20 Marks T2 - 20 Marks	
	End Sem- 60 Marks	

Course Outcomes:**Students will be able to**

- Prepare base map
- Learn data requirements and prepare questionnaire for Socio-economic survey
- Conduct Physical Surveys
- Present the statistical data through graphic presentation
- Present spatial data through Graphic presentation

Unit 1: Urban Data Inventory (6 Hrs)

Data requirements for spatial planning – data checklist

Unit 2: Data Collection Techniques (6 Hrs)

Primary data collection techniques; Stages of conducting primary survey; Visual survey and reconnaissance survey; Personal interview and dialogues; Focused group discussion; Participatory Rapid Appraisal; Designing of questionnaire Secondary data collection: published and unpublished sources of data: Topo sheets, aerial photography, satellite imagery, GSI, Bhuvan geo portal

Unit 3: Types of Surveys (6 Hrs)

Socio – economic survey; Land use / utilization surveys; Density surveys - net and gross residential and non-residential density patterns and analysis; Infrastructure surveys

Unit 4: Analytical Techniques (6 Hrs)

Trend Analysis: Moving average method

Unit 5: Data Representation Protocol (6 Hrs)

Land use and land cover classification and coding at various levels; Color and black and white presentation techniques; Basic protocols of illustration

References:

- Building Structures – James Ambrose
- Statistical Methods – S. P. Gupta
- Regional Planning: Concepts, Techniques Policies – R. P. Mishra
- Community Analysis and Planning Techniques - Richard E. Klasterman
- Geospatial Techniques in Urban Planning – ShenZhesujiang

[PL-19007]Infrastructure Planning		Credits:3
Teaching Scheme	Examination Schemes	
Lectures: 3 Hrs/week	T1 - 20 Marks	
	T2 - 20 Marks	
	End Sem- 60 Marks	

Course Outcomes:**Students will be able to**

- estimate water supply demand for an area
- prepare City Sanitation Plans
- analyse requirement of social infrastructure in city planning.
- analyse infrastructural services in Regional Plans.
- analyse Regional Infrastructure issues.

Unit 1: Water supply

Concept of basic needs; formulation of objectives, norms and standards; Planning for water supply; Source of supply, source analysis, quality and quantity; Issues related to transmission of water, treatment methods, sequence, benefits; Distribution systems suitable in large city, small town; basic requirements, design guidelines; Technological options for water supply; Aspects of water distribution in far flung areas; Water supply projects financing and management; water pricing, water pollution. **(8 Hrs)**

Unit 2: Sewage and Sanitation

Biological / Environmental / Cultural concepts in environmental sanitation; Low cost sanitation options: biogas, Sulabh Sauchalaya, etc.; Basic information, alternative disposal systems and conditions of use; Principles of sewage system layout; Collection, transportation and treatment of sewage; Principles of water bound disposal system, storm water drainage systems; Different methods of sewage treatments; Issues related to development parameters. Solid waste: basic principles, generation, characteristics, collection, collection, disposal, management of city waste; Environmental issues of garbage disposal; Alternative technological innovations, conversion of garbage into usable forms. **(10 Hrs)**

Unit 3: Social Infrastructure

Planning for fire protection services and space standards; Locational criteria, implications on land-use and density. Planning for electrification, general scenario, services and space standards of transformers; Locational criteria, load forecasting, standards for education and health care facilities. Institutional arrangements for municipal services, sector issues and assessments, financing systems, administrative set-up, people's participation **(6 Hrs)**

Unit 4: Regional Infrastructure Planning

Regional poverty and basic needs; Basic needs approach to the provision of infrastructure and networks; Regional infrastructure and network systems: Physical (roads, irrigation system, water supply, sanitation, drainage, watershed management, fire services, telecommunication, energy, electricity, solid waste disposal, etc.); Social (health and education) and economics (banking, marketing and public distribution systems); issues, methodology, role of regional planner. **(6 Hrs)**

Unit 5: Issues in Regional Infrastructure Planning

Planning and programming approaches for regional infrastructure and network systems; Environmental, social and economic impacts of infrastructure and network systems; Integrated planning organization and management of regional infrastructure and network systems; Economic costing of regional networks and services; Pricing and cost recovery for district networks and services **(6 Hrs)**

References:

- Infrastructure Planning Handbook / Alvin S. Goodman & Makarand Hastak
- Infrastructure Management/ W.R. Hudson ,R.C.G. Hass, W. Uddin
- Water Supply and waste water Engg. / B S N Raju
- Inclusive Planning and Social Infrastructure / A.K. Jain
- Central Public Health and Environmental Engineering Organization (CPHEEO) Manual
- URDPFI Guidelines/ 2014 / Mott MacDonald Consultants

[PL-19008]Rural Planning and Development		Credits: 3
Teaching Scheme	Examination Schemes	
Lectures: 3 Hrs/week	T1 - 20 Marks T2 - 20 Marks	
	End Sem- 60 Marks	

Course Outcomes:

Students will be able to

- a. explain the nature and constraints of rural societies.
- b. relate rural areas with development steps in the past.
- c. interpret the importance and implications of Panchayat Raj system.
- d. apply planning models and tools for rural development.
- e. adapt the legal scopes and procedures for rural planning

Unit 1: Introduction to Rural Development (6 Hrs)

Meaning, nature and scope of development; Nature of rural society in India; Hierarchy of settlements; Social, economic and ecological constraints for rural development, changing patterns of rural India in terms of consumption, land utilization, cropping, holding size, living standards and its implications on planning process.

Unit2: Roots of Rural Development in India (6 Hrs)

Rural reconstruction and Sarvodaya programme before independence; Impact of voluntary effort and Sarvodaya Movement on rural development; Constitutional direction, directive principles; beginning of planning and community development; National extension services.

Unit 3: Evolution of Decentralized Governance and Planning Process in India (10 Hrs)

Need for decentralized planning, Balwant Rai Mehta Committee - three tier system of rural local Government; Need and scope for people's participation and Panchayati Raj; Ashok Mehta Committee - linkage between Panchayati Raj, participation and rural development, 73rd Constitution Amendment Act, including - XI schedule, devolution of powers, functions and finance; Panchayati Raj institutions - organizational linkages; Gram Sabha - revitalized Panchayati Raj; Panchayati Raj divergence at state level.

Unit 4: Rural Planning Procedure (10 Hrs)

Planning process at National, State and District levels; Planning, development, implementing and monitoring organizations and agencies; Urban and rural interface - integrated approach and local plans; Multi-Sector and multi-level integrated approach to planning (vertical and horizontal spatial integration); Rural Planning Schemes/ village Development Plans- their procedures, scope, resource mapping, data base, funding sources, spatial planning etc; Case Studies; Special component plan and sub-plan for the weaker section; Micro-eco zones;

Unit 5: Programs/Policies/Schemes for rural development (6 Hrs)

Five Year Plans and Rural Development, Development initiatives/programs/policies for rural infrastructure development (housing, water, sanitation, electrification, roads etc), agriculture, social development, employment etc; case studies.

Unit 6: Technology in Rural Development (6 Hrs)

ICT in rural development, Rural Information system, Weather forecasting, disaster minimization, market information, etc. E- Panchayats, energy efficient technologies and alternative technologies, Sustainable rural development, case studies

References:

- Rural Development and Planning in India, by V. Nath, 2010
- Dynamics of New Panchayati Raj System in India: Select states, Ganapathy Palanithurai, Concept Publishing Company, 2002
- Reading Material on Village Planning and Rural Development, ITPI, New Delhi
- Human Settlements A Planning Guide to Beginners, K.R. Thooyavan , published by Ma Publication
- Constitution (73rdGoI, New Delhi Amendment) Act
- Manual of Integrated District Planning, 2006, Planning Commission
- Five Year Plans, Planning Commission

[MA-19005]Qualitative and Quantitative Techniques		Credits : 3
Teaching Scheme	Examination Schemes	
Lectures: 2 Hrs/week	T1 - 20 Marks	
Tutorial : 1Hr/week	T2 - 20 Marks	
	End Sem- 60 Marks	

Course outcomes:**Students will be able to**

- apply Statistical and Quantitative Techniques in planning projects
- analyse data collected from field and to draw conclusions with the help of various statistical tools.
- do forecasting of future trends and decision theory

Unit 1: Correlation and Regression Analysis**(6 Hrs)**

Degree of correlation, Scatter Diagram, correlation analysis, correlation co-efficient, coefficient of rank correlation, simple Linear regression, lines of regression, coefficient of regression.

Unit 2: Statistical Inference**(8 Hrs)**

Types of estimation; point, interval, testing of hypothesis, statistical hypothesis, simple and composite tests of significance, null hypothesis, alternative hypothesis, types of errors, level of significance, critical region; two tailed and one tailed tests, large and small sample tests for mean and proportion; Applications in planning.

Unit 3: Chi-Square Test and Analysis of Variance (ANOVA)**(6 Hrs)**

Chi-square distribution: applications of chi-square distribution; test of goodness of fit; ANOVA distribution; Applications in planning

Unit 4: Decision Theory**(8 Hrs)**

Decision making under conditions of certainty, uncertainty, and conditions of risk, decision trees, pay off matrix.

Text Book:

- Statistical Methods by S.P. Gupta, Sultan Chand and Sons, (Latest Edition)

References:

- Applied Statistics by S.C. Gupta and V.K. Kapoor. Sultan Chand Publishers
- Problems and Solutions in Statistics by V.K. Kapoor- Sultan Chand Publishers
- Fundamentals of Statistics by S.C. Gupta. Himalaya Publications
- Statistical Methods for Social Scientists by K.A. Yeomans- Penguin Education Series
- The practice of Business Statistics by Manish Sharma and Amit Gupta, Khanna Publishing Company Private Limited, New Delhi.

[PL-19009]Planning and Design Studio II (Area Appreciation) Credits:4	
Teaching Scheme	Examination Schemes
Practical: 10 Hrs/week	T1 - 20 Marks T2 - 20 Marks
	End Sem- 60 Marks

Course Outcomes:

Students will be able to

- a. appreciate an area in terms of land uses, administration, urban form etc through primary physical surveys and secondary data.
- b. represent the data through standard graphics, drawings, and photographs.
- c. familiarize with software for base map, data entry, analysis and multi-media presentations.
- d. acquire skills of written and verbal communication.

Suggested Exercises

Exercise 1 (Individual): Base map Preparation

Prepare base map of a chosen area (approximately 1 sq km) based on satellite image. All components of base map to be shown.

Exercise 2 (Group): Introductory Survey Assignment

Prepare survey questionnaires, conduct physical (field) and household/ user/ person surveys, compile data in tabular format and basic analysis of the data

Exercise 3: Area Appreciation

Appreciation studies of residential, commercial, institutional areas in small urban and / or rural settlements; Data collection through site visits, surveys and documentation; Graphic presentation of collected primary and secondary data; Preparation of base maps and key maps of study area; Composition of drawings, proportions of lettering and line thickness, standard symbols, line-styles, color-coding; Legend and drawing formats; Appreciation through thematic maps of various levels of planning; Basic principles, composition for architectural building photographs and planning, site photographs; Graphic presentation and communication skills; Use of power point and multi-media projections.

References:

- Qualitative Analysis for Planning and Policy by John Gaber and Sharon Gaber. Planner Press, APA 2007
- Fundamentals of land development by David and PE Johnson. John Wiley and Sons, 2008
- Community Analysis and Planning techniques by Richard E Closterman. Rowman and Littlefield 1990

[PL-19010]Surveying Lab Credits:2	
Teaching Scheme	Examination Schemes
Practical: 4 Hrs/week	T1 - 20 Marks T2 - 20 Marks
	End Sem- 60 Marks

Course outcomes:

The students will be able to

- a. understand the fundamentals of surveying such as units, symbols, type of work etc. for the better understanding of subject.
- b. contribute in conducting scientific measurements and compute the area of the sites before commencement of actual project.
- c. plot and measure on site with the help of different methods of plane table survey
- d. carry out measurements in horizontal and vertical plane.
- e. use Aerial Photography and GIS for Preparation of Maps and Plans.

Suggested Lab Experiments for Surveying and Photogrammetry:

Exp.No	Name of Practical
1	Measurement of distance by Ranging and Chaining.
2	Determination of area of given polygon by chain & cross-staff survey.
3	Measurement of bearings of sides of traverse with prismatic compass and computation of correct included angle.
4	Locating given points or building by plane table surveying
5	Three point problem in plane table surveying.
6	Measurement of horizontal angles Theodolite
7	Measurement of vertical Angles with Theodolite
8	Determination of elevation of various points with dumpy level by height of instrument method and rise & fall method.
9	To study Stereo pair, Pocket and Mirror Stereoscopes
10	To study total station and its uses
11	To study GPS receiver and its uses.

References:

- Surveying (Volume I and II) by B.C. Purnia. Laxmi Publications, Delhi, 2005
- Advanced Surveying: Total Station and Remote Sensing. Pearson Publishers- 2007
- Digital Photogrammetry by Wilfried Linder. Springer Publishers 2008

[HS-19001]Effective Communication Skills

Credit: 1

Teaching Scheme:

Practical: 2 hrs / week

Examination Scheme:

6 Assignments: 90 Marks
15 marks each
10 Marks: Attendance

Course Outcomes:

Student will be able to

- analyze aspects of effective communication and its usage in various fields
- reflect on basic language skills – listening, speaking, reading and writing and attempt tasks by using functional grammar and vocabulary effectively
- reproduce their understanding of concepts / principles of communication skills
- present themselves well in front of large audience on a variety of situations related to group communication and presentation in a relevant scenario. Moreover, they will get the knack for structured conversation to make their point of views clear to the listeners

Unit 1: Foundation of Language

[6 Hrs]

Effective communication, grammaticality and acceptability, accuracy and appropriateness, common errors, vocabulary enhancement

Unit 2: Listening

[6 Hrs]

Stages of listening (pre, while and post), strategies to develop listening skills, listening comprehension, problematic sounds

Unit 3: Speaking

[6 Hrs]

Oral communication, pronunciation, stress, connected speech, intonation and pauses, formal and informal expressions, conversation skills, group discussion, presentation skills

Unit 4: Reading and Writing

[6 Hrs]

Types of reading, techniques of reading, reading comprehension, reading manuals, formal emails, memos,

etc. Stages of writing (pre, while and post), 7 Cs of technical communication, drafting, editing, summarizing, letter / email writing

References

- Communication Skills for Engineers by S. Mishra & C. Muralikrishna (Pearson)
- Communication Skills for Technical Students by T.M. Farhathullah (Orient Longman)
- Written Communication in English by Saran Freeman (Orient Longman)
- Essential English Grammar (Elementary & Intermediate) Raymond Murphy (CUP)
- Communication for Business: A Practical Approach by Shirley Tailor (Longman)
- Developing Communication Skills by Krishna Mohan & Meera Banerji (Macmillan)
- Business Correspondence and Report Writing, R. C. Sharma & Krishna Mohan (Tata McGraw Hill)

[HS-19002] Design Thinking

Credit: 1

Teaching Scheme:

Practical: 2hrs/week

Examination Scheme

CCE: 50 Marks,

ESE: 50 Marks

Course Outcomes:

Student will be able to

- relate with and Compare the various learning styles and memory techniques and Apply them in their engineering education
- analyse emotional experience and Experiment with emotional expressivity to better understand users while designing products
- appreciate the importance of design thinking, Develop new ways of thinking and Learn the innovation cycle for creating innovative products
- understand individual differences and its impact on everyday decisions so as to demonstrate frameworks, strategies, techniques while creating innovative products
- develop skills for evaluating, articulating, refining, and creating an innovative engineering product that solves customer problems(s)

Unit 1: An Insight to Learning

Understanding the Learning Process, Kolb's Learning Styles, Assessing and Interpreting

Unit 2: Remembering Memory

Understanding the Memory process, Problems in retention, Memory enhancement techniques

Unit 3: Emotions: Experience & Expression

Understanding Emotions: Experience & Expression, Assessing Empathy, Application with Peers

Unit 4: Basics of Design Thinking

Definition of Design Thinking, Need for Design Thinking, Objective of Design Thinking, Concepts & Brainstorming, Stages of Design Thinking Process (explain with examples) – **Empathize, Define, Ideate, Prototype, Test**

Unit 5: Being Ingenious & Fixing Problem

Understanding Creative thinking process, Understanding Problem Solving, Testing Creative Problem Solving,

Unit 6: Process of Product Design

Process of Engineering Product Design, Design Thinking Approach, Stages of Product Design, Examples of best product designs and functions, **Assignment – Engineering Product Design**

Unit 7: Prototyping & Testing

What is Prototype? Why Prototype? Rapid Prototype Development process, Testing, **Sample Example**, Test Group Marketing

Unit 8: Celebrating the Difference

Understanding Individual differences & Uniqueness

Group Discussion and Activities to encourage the understanding, acceptance and appreciation of Individual differences

Unit 9: Design Thinking & Customer Centricity

Practical Examples of Customer Challenges, Use of Design Thinking to Enhance Customer Experience, Parameters of Product experience, Alignment of Customer Expectations with Product Design

Unit 10: Feedback, Re-Design & Re-Create

Feedback loop, Focus on User Experience, Address “ergonomic challenges, User focused design, rapid prototyping & testing, final product, **Final Presentation – “*Solving Practical Engineering Problem through Innovative Product Design & Creative Solution*”**