JSPM UNIVERSITY PUNE

Recognized by UGC u/s 2 (f) of UGC Act 1956 and enacted by the State Government of Maharashtra - JSPM University Act, 2022 (Mah.IV of 2023)

JSPM University Pune

Faculty of Science and Technology

School of Civil and Environmental Sciences

NEP aligned Syllabus

for

FY M. Tech. (Real Estate Valuation)

(Effective from AY: 2025-26)

JSPM University Pune

FACULTY OF SCIENCE & TECHNOLOGY	W. E. F	2024 - 2025
SCHOOL OF CIVIL AND ENVIRONMENTAL SCIENCES	RELEASE DATE	01/07/2024
FIRST YEAR MASTER OF TECHNOLOGY (REAL ESTATE VALUATION)	REVISION NO.	1.0 (NEP)

COURSE STRUCTURE (NEP 2020 Aligned)

SEMESTER I (LEVEL 6.5)

COURSE			TEACHING SCHEME				EXAMINATION SCHEME AND MARKS									
			Hours / Week				THEORY (Equal Weightage for CIE and ESE)				PRACTICAL (Equal Weightage for CIE and ESE)		ORAL (Equal Weightage for CIE and ESE)		TOTAL	CREDITS
TYPE	CODE	COURSE NAME	L	T	P	EL	CONTINUOUS INSEMESTER EVALUATION (100 Marks)			END SEMESTER EXAMINATION (100 / 50 Marks)	CONTINUOUS INSEMESTER EVALUATION (50 Marks)	END SEMESTER EXAMINATION (50 Marks)	CONTINUOUS INSEMESTER EVALUATION (50 Marks)	END SEMESTER EXAMINATION (50 Marks)		
							T1 (30 Marks)	T2 (30 Marks)	Assign-ments (40 Marks)							
PSMC	230GMAM03_01	Probability and Statistics	2	1	-	-	30	30	40	100	-	-	-	-	100	3
PSBC	230GRVM01_01	Principles of Valuation	3	-	-	-	30	30	40	100	-	-	-	-	100	3
PCC	230GRVM02_01	Bookkeeping and Accountancy	2	-	-	2	30	30	40	100	-	-	-	-	100	2.5
PCC	231GRVM03_01	Regional Planning and Urban Land Development	2	-	-	-	30	30	40	50	-	-	-	-	50	2
MMC	-	Multidisciplinary Minor Course- I	1	-	2	-	-	-	-	-	50	50	50	50	100	2
SEC	230GTEM19_01	Geospatial Analysis	2	-	2	-	-	-	-	-	50	50	50	50	100	3
VSC (HSMC)	230IDCB01_01	Design Thinking and Creativity	1	-	-	2	-	-	-	-	-	-	50	50	50	1.5
AEC (HSMC)	231UENM01_01	Communicative English for Professionals	1	-	2	-	-	-	-	-	50	50	-	-	50	2
RMC	230IRMM01_01	Research Methodology	2	-	-	-	30	30	40	50	-	-	-	-	50	2
LC	230GRVM16_01	Valuation lab	-	-	2	-	-	-	-	-	-	-	50	50	50	1
TOTAL			16	1	8	4									**750**	**22**

Sem	Multidisciplinary Minor Course	
I (MMC – I)	Course Code	230GRAM24_01
	Course Name	Sensors and Automation
II (MMC – II)	Course Code	230GETM16_02
	Course Name	IoT Basics and Applications

Ms. Ankita Turate
Programme Coordinator, MTech-REV

Dr. Aniket Patil
Director (I/C), School of Civil and Environmental Sciences

Dr. R. S. Deshpande
Dean, Faculty of Science and Technology

Dr. Anuradha S. Deshpande
Associate Dean (Academics)

Prof. B.B. Ahuja
Vice Chancellor, JSPM University Pune

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	FACULTY OF SCIENCE & TECHNOLOGY	W. E. F	2024 - 2025
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FIRST YEAR MASTER OF TECHNOLOGY (REAL ESTATE VALUATION)		REVISION NO.	1.0 (NEP)

COURSE STRUCTURE (NEP 2020 Aligned)

SEMESTER II (LEVEL 6.5)

COURSE			TEACHING SCHEME				EXAMINATION SCHEME AND MARKS									
			Hours / Week				THEORY (Equal Weightage for CIE and ESE)				PRACTICAL (Equal Weightage for CIE and ESE)		ORAL (Equal Weightage for CIE and ESE)		TOTAL	CREDITS
TYPE	CODE	COURSE NAME	L	T	P	EL	CONTINUOUS INSEMESTER EVALUATION (100 Marks)			END SEMESTER EXAMINATION (100 / 50 Marks)	CONTINUOUS INSEMESTER EVALUATION (50 Marks)	END SEMESTER EXAMINATION (50 Marks)	CONTINUOUS INSEMESTER EVALUATION (50 Marks)	END SEMESTER EXAMINATION (50 Marks)		
							T1 (30 Marks)	T2 (30 Marks)	Assign-ments (40 Marks)							
PCC	230GRVM04_02	Principles of Insurance and Loss Assessment	2	1	-	-	30	30	40	100	-	-	-	-	100	3
PCC	231GRVM05_02	Advanced Surveying	3	-	-	-	30	30	40	100	-	-	-	-	100	3
PCC	231GRVM06_02	Real Estate Management	2	-	-	2	30	30	40	100	-	-	-	-	100	2.5
MMC	-	Multidisciplinary Minor Course- II	1	-	2	-	-	-	-	-	50	50	50	50	100	2
SEC	230GSEM19_02	Building Information Modelling	2	-	2	-	-	-	-	-	50	50	50	50	100	3
VSC (HSMC)	230IINB02_02	Innovation	1	-	-	2	-	-	-	-	-	-	50	50	50	1.5
AEC (HSMC)	231UENM02_02	Business Communication	1	-	2	-	-	-	-	-	50	50	-	-	50	2
RMC	230IRMM02_02	Research Design and Techniques	2	-	-	-	30	30	40	50	-	-	-	-	50	2
LC	230GRVM18_02	Advanced Surveying Lab	-	-	2	-	-	-	-	-	50	50	-	-	50	1
IITP/FP/CEP	230GRVM19_02	Internship / Field Project / Community Engagement Programme	4 to 6 weeks													50
TOTAL			14	1	8	4									**750**	**22**

Sem	Multidisciplinary Minor Course	
I (MMC – I)	Course Code	230GRAM24_01
	Course Name	Sensors and Automation
II (MMC – II)	Course Code	230GETM16_02
	Course Name	IoT Basics and Applications

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JSPM University Pune

F.Y. M. Tech "Real Estate Valuation"

Semester I

Course Type: PSMC	**Course Title:** Probability and Statistics	
Course Code: 230GMAM03_01	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 3	**Lecture (L):** 2 **Tutorial (T):** 1 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 100 Marks

Prerequisite Courses, if any: -

Course Objectives:

- The course objective of this course is to give students a foundation in statistical and probabilistic analysis, which is usually utilized in a variety of engineering and scientific applications.

Course Outcomes: On completion of the course, learner will be able to

CO1: Understand statistical problem concepts.
CO2: Observe and analyze the behavior of given sample.
CO3: Apply the concept of correlation and regression to find relation between data.
CO4: Learn discrete and continuous probability
CO5: Acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life problems.
CO6: Understand of probability principles and be familiar with standard distributions, which can be used to explain phenomena in real life.

Course Contents

Unit I	**Introduction to Statistics**	**(7 Hrs)**
Statistical methods, Scope and limitations, Population and sample, Frequency distribution, Measures of Central Tendency		
Unit II	**Measures of Dispersion**	**(7 Hrs)**
Mean Deviation, Standard Deviation, Coefficient of Variation, Moments, Skewness, Kurtosis		
Unit III	**Correlation and Regression**	**(7 Hrs)**
Coefficient of correlation, Rank correlation, Regression coefficients, Lines of regression		

Unit IV	**Probability Distributions**	**(8 Hrs)**
Binomial Distributions, Mean, Variance and Recurrence formula for Binomial distribution, Poisson Distributions, Mean, Variance and Recurrence formula for Poisson distribution, Normal Distributions		
Unit V	**Statistical Decisions**	**(8 Hrs)**
Significance levels-Tests concerning Mean, Type I & Type II errors, critical region, Null and Alternative hypothesis, Chi-square test for goodness of fit, The T-Test, Confidence interval, Forecasting and time series analysis problems		
Unit VI	**Probability**	**(8 Hrs)**
Review, Dependent and Independent events, Addition & Multiplication Rules, Conditional Probability, Total Probability, Bayes' Theorem and independence		

Learning Resources

Text Books:

1. Gupta, S.C. and Kapoor V.K. "Fundamentals of Mathematical statistics", Sultan Chand and Sons, 1978.

Reference Books:

1. Johnson R and G. Bhattacharya, "Statistics-Principles and methods". John Wiley, NY, 1985.
2. Miller & Freund's, "Probability & Statistics, for Engineers & Scientists", 6th Edition, Pearson Education.
3. Vijay K. Rohatgi and A.K. Md. Ehsanes Saleh, "An Introduction to Probability and Statistics", John Wiley, second edition, 2001.
4. Sheldon M. Ross, "Introduction to Probability and Statistics for Engineers and Scientists", Academic Press, 2009.

MOOC / NPTEL Courses:

1. NPTEL Course "Introduction to theory of probability", Prof. Mrityunjoy Chakraborty, IIT Kharagpur (Link of the Course: http://nptel.ac.in/courses/117105085/)
2. NPTEL Course "Introduction to probability theory and Statistics", Prof. S. Dharmaraja, IIT Delhi (Link of the Course: https://onlinecourses.nptel.ac.in/noc22_ma81/preview)
3. Swayam Course "Probability and Probability Distribution" by Dr. P. Nagesh.(Link of the Course: https://onlinecourses.swayam2.ac.in/cec23_ma09/preview)

Additional Web Resources:

1. https://www.coursera.org/learn/probability-statistics
2. https://www.coursera.org/learn/introductiontoprobability
3. https://www.coursera.org/learn/basic-statistics

JSPM University Pune F.Y. M. Tech "Real Estate Valuation" Semester I		
Course Type: PSBC	**Course Title:** Principles of Valuation	
Course Code: 230GRVM01_01	**Teaching Scheme:** (Hrs. / Week)	**Examination Scheme:** Theory
Credits: 3	**Lecture (L):** 3 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 100 Marks

Prerequisite Courses:
Quantity Surveying and Valuation

Course Objectives:

- To Develop the ability to assess the value of real estate properties based on market data and appraisal techniques.
- To gain a comprehensive understanding of the real estate market, including factors that influence supply and demand, market trends, and regional variations.
- To explore different valuation models and their underlying statistical and analytical components.
- To create clear and professional valuation reports that meet industry standards.
- To Understand the importance of selecting appropriate comparable sales for valuation.
- To Build practical valuation skills through hands-on exercises, case studies, and real-world examples.

Course Outcomes: On completion of the course, learner will be able to-
CO1: Describe the fundamental concepts and classify different types of valuation.
CO2: Compute present and future values of ordinary annuities and annuities due using appropriate financial formulas.
CO3: Apply various income-based approaches to determine property or asset value.
CO4: Analyze the distribution of sales instances using the Bell Curve method.
CO5: Interpret the principles and evaluate values using the cost approach.
CO6: Utilize statistical concepts and methods in the context of property valuation.

Course Contents

Unit I	**Introduction to Valuation and Value Concepts**	**(7 Hrs)**

Introduction to Valuation: Cost, price and value Definitions and Distinctions; Types of Value and Their Importance in Real Estate; Value Elements: Ingredients, Characteristics, and Components.		
Unit II	**Annuities, Capitalization, and Sinking Fund**	**(8 Hrs)**
Annuities and Their Application in Valuation; Capitalization Rate and Its Significance; Sinking Fund and Capital Redemption: Methods and Implications.		
Unit III	**Income Approach and Lease Analysis**	**(7 Hrs)**
Construction and Use of Valuation Tables; Income Approach: Concepts and Theories; Rent Theories: Origin, Evolution, and Types		
Unit IV	**Market Approach and International Standards**	**(8 Hrs)**
Real Estate Market and Market Value; Bell Curve and Distribution of Sale Instances; Comparison of Sale Instances: Factors, Methods, and Weightages; Application of International Valuation Standards		
Unit V	**Cost Approach and Depreciation**	**(7 Hrs)**
Cost Approach to Value: Methods and Concepts; Accrued Depreciation: Calculation and Importance; Depreciation and Remaining Life: Economic Life and Effective Age		
Unit VI	**Analytical Methods, Ethics, and Conclusion**	**(8 Hrs)**
Statistical and Analytical Methods in Valuation; Application of IOWA Type Survival Curves; Ethical Considerations in Valuation Practice; Review, Conclusion, and Future Trends.		

Learning Resources

Text Books:

1. McKinsey & Company Inc. and Tim Koller Marc Goedhart, and David Wessels, *"Valuation: Measuring and Managing the Value of Companies"* Wiley, Sixth Edition.
2. Roshan Namavati, *"Theory and Practice of Valuation"*, Lakhani Book Depot, Latest Edition.
3. Sheridan Titman and John D. Martin, *"Valuation: The Art and Science of Corporate Investment Decisions",* Pearson, Third Edition.

Reference Books:

1. B.D. Chatterjee, *"An Illustrated Guide to Business Valuation"*, Bloomsbury India, 2020.
2. Corporate Professionals, *"Business Valuation in India – Beyond the Numbers"*, Commercial Law Publishers (India) Pvt. Ltd., Third Edition, 2025.
3. Siddharth Jain, *"Business Valuation: A Handy Guide for Beginners & Professionals"*, Self-Published, 2023.

MOOC / NPTEL Courses:

1. NPTEL Course "Corporate Finance" By Prof. Abhijeet Chandra, IIT Kharagpur (Link for the course: https://onlinecourses.nptel.ac.in/noc22_mg92/preview)

Additional Web Resources:

1. https://www.udemy.com/course/business-valuation/
2. https://www.udemy.com/course/company-valuation-financial-modelling-and-analysis/
3. https://www.coursera.org/courses?query=valuation

JSPM University Pune

F.Y. M. Tech "Real Estate Valuation"

Semester I

Course Type: PCC	**Course Title:** Bookkeeping and Accountancy	
Course Code: 230GRVM02_01	**Teaching Scheme:** (Hrs. / Week)	**Examination Scheme:**
Credits: 2.5	**Lecture (L):** 2 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 2	**Theory (TH):** 100 Marks

Prerequisite Courses:

1. Basics of Finance and Accounting

Course Objectives:

- To familiarize students with the double-entry accounting system and the bookkeeping process.
- To provide knowledge of the golden rules of accounting, budgeting, and forecasting techniques to aid in financial planning.
- To enable students to prepare and analyze financial statements, including balance sheets, cash flow statements, and income statements.

Course Outcomes: On completion of the course, learner will be able to-

CO1: Apply the golden rules of accounting to classify real, personal, and nominal accounts.

CO2: Record transactions through journal and ledger entries.

CO3: Prepare Profit & Loss Account and calculate net profit.

CO4: Track and categorize revenue, expenses, and assets.

CO5: Apply depreciation methods to fixed assets.

CO6: Understand the applications of bookkeeping in real estate and valuation.

Course Contents

Unit I	**Introduction to BookKeeping**	**(5 Hrs)**

Meaning and Objectives of BookKeeping; Double Entry BookKeeping: Principles and Significance, Golden rules of accounting: Real, Personal and Nominal Account.

Unit II	**Books of Prime Entry and Subsidiary Books**	**(5 Hrs)**
Introduction to Books of Prime Entry and Their Importance; Cash Book, Bank Book, Journal, and Ledger Purchase and Sale Books, Debit and Credit Notes Register.		
Unit III	**Accounting Records and Financial Statements**	**(5 Hrs)**
Writing of Books: Recording Transactions; Posting and Closing of Accounts; Trading Account, Profit and Loss Account, Income and Expenditure Account; Presentation of Balance Sheet: Structure and Components.		
Unit IV	**Overheads, Expenses, and Break-Even Analysis**	**(5 Hrs)**
Factory Overhead, Administrative Overhead, and Their Calculation; Fixed and Variable; Expenses: Differentiation and Management; Break-Even Point: Understanding and Calculation.		
Unit V	**Depreciation and Methods**	**(5 Hrs)**
Depreciation: Concept, Importance, and Types; Methods of Computing Depreciation in Accounts.		
Unit VI	**Practical Applications and Case Studies**	**(5 Hrs)**
Application of Bookkeeping in Real Estate Valuation; Case Studies: Financial Analysis in Real Estate Investment.		

Learning Resources

Text Books:

1. Jerry J. Weygandt, Paul D. Kimmel, and Donald E. Kieso, *"Financial Accounting",* Wiley, Ninth Edition.
2. Ray H. Garrison, Eric W. Noreen, and Peter C. Brewer, *"Managerial Accounting"*, McGraw-Hill Education, Sixteenth Edition.
3. Charles T. Horngren, Srikant M. Datar, and Madhav V. Rajan, *"Cost Accounting: A Managerial Emphasis",* Pearson, Sixteenth Edition.

Reference Books:

1. Benjamin Graham and Spencer B. Meredith, *"The Interpretation of Financial Statements"*, Harper Business.
2. Jae K. Shim and Joel G. Siegel, *"Accounting Handbook",* McGraw-Hill Education, Sixth Edition.
3. Steven Bragg, *"The Accountant's Guide to the Universe: Heaven and Hell by the Numbers",* Accounting Tools, Second Edition.

MOOC / NPTEL Courses:

1. "*Financial Accounting,* Prof. CA. Varadraj Bapat, IIT Bombay (Link of the Course: https://onlinecourses.nptel.ac.in/noc19mg37/preview)

Additional Web Resources:

1. https://www.udemy.com/course/mastering-quickbooks
2. https://www.coursera.org/specializations/finance-accounting

JSPM University Pune

F.Y. M. Tech "Real Estate Valuation"

Semester I

Course Type: PCC	**Course Title:** Regional Planning and Urban Land Development	
Course Code: 231GRVM03_01	**Teaching Scheme:** (Hrs. / Week)	**Examination Scheme:**
Credits: 2	**Lecture (L):** 2 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 100 Marks

Prerequisite Courses, if any: -

Course Objectives:

1. Understand the basic principles of regional planning and urban land development
2. Analyze the role of government in allocation, distribution and regulation of land.
3. Articulate theory and practice by applying the concepts to real life problems.

Course Outcomes: On completion of the course, learner will be able to

CO1: Understand the importance of and application regional planning
CO2: Understand stylized facts about cities, their sizes and types, and their contributions to economic and social development
CO3: Understand the Administrative hierarchy and principles of town planning
CO4: Understand the role infrastructure plays in the modern city and in real estate markets with an emphasis on transportation
CO5: Explain density analysis to accommodate population and design infrastructure
CO6: Formulate zoning regulation and building bylaw in various contexts

Course Contents

Unit I	**Concept of Region**	**(5 Hrs)**
Concept and meaning of Region - Classification of Regions - Reason for the popularity of the concept of region- Functional and Formal Regions		
Unit II	**Regions & Regionalization**	**(5 Hrs)**
Hierarchy of regions - Types of Regions – Multi-Level Planning Perspective- Regions on the basis of stages of economic Development- Regions based on the activity status analysis - Delineation of Regions in India		
Unit III	**Urban Growth and Features**	**(5 Hrs)**
Administrative hierarchy- Humans as Modifiers of the Earth- History of Regional Planning- Importance & Need of Regional Plan - Principles of Town Planning		

Unit IV	Need & Significance of Infrastructure	(5 Hrs)
Introduction to Infrastructure - Importance of Infrastructure - Twelfth Plan Target- Evaluation of the Performance of Infrastructural Services- Theories of urban land development		
Unit V	**Regional Planning and urban Development**	**(5 Hrs)**
Benefits of regional planning - Scope & Purpose of Perspective Plan - scoping and project planning - development plan approach: concepts, objectives and functions - Master planning - Five-year plans in India - Development Control Regulations (DCR) in India – Limitations of Planning		
Unit VI	**Regional Planning in India & Planning Norms**	**(5 Hrs)**
Planning for Urban Development in India- Role of flexible FSI in Urban Design and Planning- Transportation and Land Use Integration - Challenges of Inclusion		

Learning Resources

1. Fredrick Gibbered *"Town Design"*, London Architecture Press London.
2. Lewis Keeble *"Principles of Town & Country Planning",* Estates Gazette Ltd; 4th edition
3. Willian Lean *"Economics of land use planning, Urban & Rural"*, Estate Gazette Ltd.

Reference Books:

1. J.V. Henderson *"Land resource economics"* - Prentice Hall Economic theory and Cities by, New York Academic Press.
2. Kevin Lynch *"Site Planning",* M.I.T.Press, Cambridge.,U.K.
3. Arthur O'Sullivan *"Urban Economics",* McGraw-Hill Education; 8th edition
4. Ralph Turvey *"The Economics of Real Property: An Analysis of Property Values and Patterns of Use",* George Allen & Unwin Limited.
5. N. Viswanadham, Sowmya Vedula *"Design of Smart Villages",* The Centre for Global Logistics and Manufacturing Strategies.

JSPM University Pune

F.Y. M. Tech "Real Estate Valuation"

Semester I

Course Type: MMC	**Course Title:** Sensors & Automation	
Course Code: 230GRAM24_01	**Teaching Scheme:** (Hrs. / Week)	**Examination Scheme:**
Credits: 2	**Lecture (L):** 1 **Tutorial (T):** 0 **Practical (P):** 2 **Experiential Learning (EL):** 0	**Practical (PR):** 50 marks **Oral (OR):** 50 marks

Prerequisite Courses, if any:

1. Basic Electronics
2. Instrumentation & Control

Course Objectives:

- Study of means of measuring various physical variables using sensors.
- Study of various kinds of actuators.
- Introduce technologies related to upcoming Industry 4.0 paradigm.
- To prepare the learner for a career in industrial automation.

Course Outcomes: On completion of the course, learner will be able to…

CO1: Identify sensor characteristics, calibration and error analysis
CO2: Understand how different physical variables are measured
CO3: Identify different types of actuators and their implementation
CO4: Understand Hydraulic and Pneumatic actuators
CO5: Explain scope and benefit of industry 4.0 technologies.
CO6: Plan, design and implement automation systems

Course Contents

Unit I	**Instrumentation & Sensors characteristics**	**(3Hrs)**

Instrumentation & Sensors: Significance of Sensor Measurements, Classification of sensors based on domain, technology and operation.
Static characteristics: Static calibration, Linearity, Static Sensitivity, Accuracy, Static error, Precision, Reproducibility, Threshold, Resolution, Hysteresis, Drift, Span & Range etc.
Dynamic Characteristics: Sensor bandwidth and frequency response.
Signal conditioning: Amplifier, Conversion, Filtering, Impedance Buffering

Unit II	Measurements	(3Hrs)
Proximity and Distance Measurement: Limit Switch, Reed switch, Inductive, Capacitive, Hall Effect Sensors, Optical and Ultrasonic distance measurement. **Displacement Measurement:** Transducers for displacement, potentiometer, LVDT, Capacitance Types, Digital Transducers (optical encoder). **Measurement of Angular Velocity:** Tachometers, Digital tachometers and Stroboscopic Methods. MEMS 3 axis Gyroscope. **Acceleration Measurement: T**heory of accelerometer and vibrometers, accelerometers, strain gauge based and piezoelectric accelerometers. MEMS 3 Axis Accelerometer.		
Unit III	**Electrical Actuating systems**	**(2Hrs)**
Electrical Actuating systems: **DC motors:** Review of DC motor, Modelling of DC motor behaviour, Servo Amplifier, DC motor drive. DC Servo Motors. **Stepper Motors:** Characteristics of a Stepper motor, Classification of a Stepper motor, Principle of Operation, Step Angle, Electrical model of energized coil, Drive method, Stepper motor performance.		
Unit IV	**Pneumatic and Hydraulic actuating systems**	**(2Hrs)**
Pneumatic and Hydraulic actuating systems: Components of pneumatic and hydraulic systems, pumps, compressor, filter, control valves, pressure regulation, relief valves, accumulator. Single Acting and Double acting cylinders, Hydraulic motors. Simple single actuator circuits. Harmonic drive, Comb drive.		
Unit V	**Industry 4.0 and Evolution of automation**	**(3Hrs)**
Industry 4.0: Industrial Revolutions 1,2,3,4, Productivity in Manufacturing, how manufacturing changed at each IR, Work Study & motion study, Need and Types of Automation, **Evolution of automation: Automation hierarchy.** Relentless increase in computational power (Moore's law), basket of technologies, which make up Industry 4.0. Reference Architecture Model of Industry 4.0 (RAMI)		
Unit VI	**Automation Circuits**	**(2Hrs)**
Automation Circuits: Introductory Principles in Designing, Electrical and mechanical latch, Logical Design of Automation PLC and SCADA. **Case Studies:** Data Acquisition & Control Systems in Process Plants like chemical, railways and defence applications **Communication: C**ommunication protocols, Device Interfaces		

Learning Resources

Text Books:

1. Clarence W Silva, "*Sensors and Actuators: Control System Instrumentation*", CRC Press USA.
2. Frank Lamb, "*Industrial Automation Hands-On*", McGraw Hill Education 2013.

Reference Books:

1. E.O. Doebelin, "*Measurement Systems (Applications and Design)*", McGraw Hill., 5th Ed.
2. A. Smaili and F. Mrad, "*Applied Mechatronics*", OXFORD university press.
3. Thomas Beckwith, N.Lewis Buck, "*Mechanical Engineering Measurement*", Roy Marangoninarosa Publishing House, Bombay
4. Kataria Sanjay *"Industrial Automation Solutions For Plc, Scada, Drive And Field Instruments: Easy To Learn Industrial Automation"*
5. Arshadeep Bagha , Vijay Madisetti "I*nternet of Things A Hands-on Approach*", Universities Press 2018

MOOC / NPTEL Courses:

1. https://nptel.ac.in/courses/108/105/108105064/
2. https://nptel.ac.in/courses/112/107/112107242/
3. https://nptel.ac.in/courses/108105088
4. https://nptel.ac.in/courses/106105195

JSPM University Pune

F.Y. M. Tech "Real Estate Valuation"

Semester I

Course Type: MMC	**Lab Course Title:** Sensors & Automation	
Course Code: 230GRAM24_01	**Teaching Scheme:** (Hrs. / Week)	**Examination Scheme:**
Credits: 2	**Lecture (L):** 1 **Tutorial (T):** 0 **Practical (P):** 2 **Experiential Learning (EL):** 0	**Practical (PR):** 50 marks **Oral (OR):** 50 marks

Prerequisite Courses, if any: -

List of Laboratory Experiments (Minimum 10)

	Group A
1.	Characterization of Temperature Sensor (RTD).
2.	Linear Conveyor Control System
3.	Study of Two-Dimensional Position Control
4.	Demonstration of Electro hydraulic Controls through Trainer Kit
5.	Characterization of Linear Variable Differential Transformer (LVDT) (Virtual Lab) https://sl-coep.vlabs.ac.in/exp/characterize-temperature-sensor/
	Group B
6.	Demonstration of Electro pneumatic Controls through Trainer kit
7.	Study of Rotary Encoder for Speed & angle measurement
8.	Data acquisition system
9.	Demonstration of Programmable Logic Controller (PLC) based Servo motor Controller
	Group C
10.	Characterization of Strain Gauges (virtual Lab) https://sl-coep.vlabs.ac.in/exp/strain-gauge-sensor/

Virtual LAB Links:

1. Lab Name: COEP, Pune

JSPM UNIVERSITY PUNE
Recognized by UGC u/s 2 (f) of UGC Act 1956 and enacted by the
State Government of Maharashtra - JSPM University Act, 2022 (Mah.IV of 2023)

https://sl-coep.vlabs.ac.in/exp/characterize-temperature-sensor
https://sl-coep.vlabs.ac.in/exp/strain-gauge-sensor

JSPM University Pune
F.Y. M. Tech "Real Estate Valuation"
Semester I

Course Type: SEC	**Course Title:** Geospatial Analysis	
Course Code: 230GTEM19_02	**Teaching Scheme:** (Hrs. / Week)	**Examination Scheme:**
Credits: 3	**Lecture (L):** 2 **Tutorial (T):** 0 **Practical (P):** 2 **Experiential Learning (EL):** 0	**Practical (PR):** 50 marks **Oral (OR):** 50 marks

Prerequisite Courses, if any:

1. Basic Computer Knowledge
2. Remote Sensing basics

Course Objectives:

- Apply the concepts of Photogrammetry and its applications such as determination of heights of objects on terrain.
- Understand the basic concept of Remote Sensing and know about different types of satellite and sensors.
- Illustrate Energy interactions with atmosphere and with earth surface features, interpretation of satellite and top sheet maps.
- Understand different components of GIS and Learning about map projection and coordinate system.
- Develop knowledge on conversion of data from analogue to digital and working with GIS software.

Course Outcomes: On completion of the course, learner will be able to

CO1: Understand the concepts of Photogrammetry and compute the heights of objects

CO2: Apply knowledge of GIS and understand the integration of Remote Sensing and GIS **CO3:** Understand the basic concept of GIS and its applications, know different types of data representation in GIS

CO4: Understand and Develop models for GIS spatial Analysis and will be able to know what the questions that GIS can answer are

CO5: Apply knowledge of GIS software and able to work with GIS software in various application fields

CO6: Illustrate spatial and non-spatial data features in GIS and understand the map projections and coordinates systems

Course Contents

Unit I	**Introduction to GIS**	**(5 Hours)**

Basic concepts: Definition and history, Components of GIS, Recent trends and applications of GIS; Data structure and formats, Spatial data models – Raster and vector, Data base design- editing and topology creation in GIS, Linkage between spatial and non-spatial data, Data inputting in GIS. Rectification, Transformation Methods; Root Mean Square (RMS) Error.		
Unit II	**Data Types and Data Models**	**(5 Hours)**
Data Types; Spatial Data; Non-Spatial Data, Data Input; Existing GIS Data, Metadata; Conversion of Existing Data, Creating New Data, Data Models; Vector Data Model; Raster Data Model; Integration and Comparison of Vector and Raster Data Models.		
Unit III	**Spatial Data Editing**	**(5 Hours)**
Types of Digitizing Errors, Causes for Digitizing Errors; Topological Editing and Non- topological Editing; Other Editing Operations; Editing Using Topological Rules.		
Unit IV	**Attribute Data and Data Exploration**	**(5 Hours)**
Attribute Data in GIS, Attribute Data Entry, Manipulation of Fields and Attribute Data, Data Exploration; Attribute Data Query, Raster Data Query, Map- Based Data Manipulation,		
Unit V	**Spatial Analysis**	**(5 Hours)**
Spatial Data: Definition, Analysis, Processes & Steps, Software and Tools, Geodatabase Model, Role of Databases in GIS, Creating, Editing and Managing, Classification scheme of Vector- Based and Raster- Based GIS Operation Raster-Based Techniques: Methods of reclassification, overlay analysis, Digital Terrain Analysis and Modeling- TIN and DEM, Surface representation and analysis, Slope and Aspect, Geographic Visualization Data Classification, Map Comparison,		
Unit VI	**Geo Statistical Analysis Techniques:**	**(5 Hours)**
Introduction to Spatial Interpolation: Control Points, Global Method- Trend surface analysis, regression model, local methods- Thiessen polygons, density estimation, Inverse Distance weighted Interpolation, Kriging- Ordinary Kriging and Universal Kriging, GIS and decision support system, Introduction to AHP, basic principle of AHP. Principal and components of multiple criteria decision making		

Learning Resources

Text Books:

1. Jahne, B. *"Digital Image Processing"* New York: Springer-Verlag
2. Lillsand, R.M. and R.W. Kiefer, *"Remote Sensing and Image Interpretation"*, New York: Wiley.

Reference Books:

1. Pratt, W.K., "*Digital Image Processing"* New York Wiley.
2. Jain, A.K., "*Fundamentals of Digital Image Processing*", Englewood Cliffs, NJ, Prentice Hall.

MOOC / NPTEL Courses:

1. Link of the Course: https://archive.nptel.ac.in/courses/107/105/107105088/, IIT Kharagpur

Additional Web Resources:

1. https://docs.qgis.org/3.28/en/docs/training_manual/index.html

JSPM University Pune F.Y. M. Tech "Real Estate Valuation" Semester I		
Course Type: SEC	**Lab Course Title:** Geospatial Analysis	
Course Code: 230GTEM19_02	**Teaching Scheme:** (Hrs. / Week)	**Examination Scheme:**
Credits: 3	**Lecture (L):** 2 **Tutorial (T):** 0 **Practical (P):** 2 **Experiential Learning (EL):** 0	**Practical (PR):** 50 marks **Oral (PR):** 50 marks
Prerequisite Courses, if any: -		

List of Laboratory Experiments

1. Familiarization with GIS Software, Data Input
2. Geo Referencing and Projections
3. Digitization of Map/ Toposheet
4. Creation of Thematic Maps
5. Base Map Preparation
6. Data Conversion – Vector to Raster, Raster to Vector
7. Adding Attribute Data – Querying on Attribute Data
8. Vector Analysis
9. Raster Analysis
10. Map Composition
11. Developing Digital Elevation Model
12. Simple Applications of GIS in Transportation Engineering GIS

SOFTWARE: Arc GIS 10.3

TEXT BOOKS:

1. "*Concept and Techniques of GIS*" by C.P.L.O. Albert, K.W. Yong, Printice Hall Publishers

JSPM University Pune F.Y. M. Tech "Real Estate Valuation" Semester I		
Course Type: VSC	**Course Title:** Design Thinking and Creativity	
Course Code: 230IDCB01_01	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 1.5	**Lecture (L):** 1 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 2	**Oral (OR):** 50 marks
Prerequisite Courses, if any: -		
Course Objectives:		
Course Outcomes: On completion of the course, learner will be able to **CO1:** Describe the Design thinking principles of Human Centeredapproach to real life problem solving **CO2:** Demonstrate through the project-oriented approach thebasic theories and knowledge of design thinking and master the tools and principles of design thinking, and their application. **CO3:** Experiment with design thinking principles to come up with innovative solutions to the problems, as new products, services, experiences, or new Business models. **CO4:** Analysis of various applications of design thinking. **CO5:** Determine the suitable design thinking approach to solve theproblem. **CO6:** Develop a low fidelity prototype of the alternative Solutions to theidentified Problem		
Course Contents		
Unit I	**Design Thinking Introduction**	**(3 Hrs)**
Introduction & definition of design thinking, Principles, the process, Innovation in design thinking, importance of design thinking method, the relationship between design thinking and innovation & entrepreneurship. Five step method of Design thinking (Empathize, Define, Ideate, Prototype, Test). Class Activity: Students are asked to form groups. Classroom Project begins: Share ideas with team members, discuss about meaning of DT, it"s importance in today"s world. Case: ABC Nightline- IDEO Shopping Cart, (the video can be shown in classroom for discussion.)		
Unit II	**Awareness of the five stages of design thinking, Empathize & Define**	**(5 Hrs)**

Stage 1 & 2: Empathize & Define
Introduction of the tools in the stage of empathy. Emphasize the skills and tactics of interviews. Understand the persona, Methods of collecting the data from interviews. The empathy map. Establishing the Problem statement using 5 Why"s technique as a tool to understand the root cause.
(Ex.26/11 attack, rescue team not able to move with ambulance due to stagnation) & Emphasis on establishing the "Problem Statement" only for faculty ref.

Classroom Project: Each group will write the Problem Statement by using Stages of Empathy and technique of 5 Why"s.
Each group member will do the interview round for writing the problem statement.
Take record of the interview process.

Unit III	**Ideate**	**(5 Hrs)**

Stage 3, Ideate
Process to Find and select ideas, The creative process and creative principles, Creativity techniques, Evaluation of ideas. Idea Generation Stage-Fine tuning process of ideas (every team member comes up with 1 idea and passes on to next person, each idea will be fine-tuned by each team member and ultimately matured ideas are established- round robin method) and selection of best three ideas by voting method.

Classroom Project: Through the project, students will know how to propose the point of view (POV) statement based on the analyses of data from user research via the brainstorm and others.
Students are asked to submit ideas as many as possible.
Note in POV practice: please define the problem which each group is finally going to resolve.
The practice process: unpack the interview data, select one interviewee as analysis target and solution. Make inferences to generate ideas and POV statement. Please remember:
No solution in the POV statement.

Unit IV	**Prototype & Test**	**(4 Hrs)**

Stage 4 and 5, Prototype & Test
Prototype and test stage, Prototype model, The role of prototype and test in the innovation and entrepreneurship. prototype and the way to test, visualization of ideas.
Classroom project: groups design the prototype to show ideas about the innovative way to resolve the problem in the dormitory life.
Concerning the test practice: Ask other group to visit your group and test your prototype, and then in turn.

Unit V	**Understanding Business Viability**	**(3 Hrs)**

Checking the Business viability of selected ideas derived in stage 3 using BXT model, Tools for the Design Journey, Pillars of Design thinking.

Unit VI	**Presentation and closure**	**(3 Hrs)**

The student groups will give the final presentation of the project they have done (Unit 1 to 5) and close the DT process.

Learning Resources

MOOC / NPTEL Courses:

Additional Web Resources:

1. How design thinking is transforming lives in rural India - https://www.youtube.com/watch?v=EH9u1bHqwpc.
2. Design Thinking in Netflix | | Case Studio - 04 - https://www.youtube.com/watch?v=8P8gspd_Bx8)

JSPM University Pune

F.Y. M. Tech "Real Estate Valuation"

Semester I

Course Type: AEC	**Course Title:** Communicative English for Professionals	
Course Code: 231UENM01_01	**Teaching Scheme:** (Hrs. / Week)	**Examination Scheme:**
Credits: 2	**Lecture (L):** 1 **Tutorial (T):** 0 **Practical (P):** 2 **Experiential Learning (EL):** 0	**Practical (PR):** 50 Marks

Prerequisite Courses, if any: -

Course Objectives:

- Remember the different aspects of communication.
- Understand basics of grammar, sentence construction and vocabulary to write and speak effectively.
- Apply appropriate modes of expressions in written and oral communication.
- Analyze the attitude and aptitude of the speaker in the professional sphere for effective listening skill.
- Evaluate the non-verbal clues of the speaker for effective communication.
- Cultivate students to create commendable personalities.

Course Outcomes: On completion of the course, learner will be able to

CO1: Understand and practice different types of communication.

CO2: Reflect on basic language skills-listening, speaking, reading, and writing and attempt tasks by using functional grammar and vocabulary effectively.

CO3: Reproduce their understanding of concepts/principles of business communication skills.

CO4: Build relationships, solve problems, ensure understanding, resolve conflicts, and improve accuracy.

CO5: Become more self-confident and develop a strong determination.

CO6: Build social skills with ease and comfort.

Course Contents

Unit I	**Foundation of Communication**	**(3 Hrs)**
Importance and types of Communication, Types of communication: Verbal and Non-verbal, Channels of communication, Barriers to Effective Communication and ways to mitigate.		
Unit II	**Language Competency/Functional English**	**(3 Hrs)**
Basic rules of Phonics, Parts of Speech, Sentence Constructions, Prefixes and Suffixes		
Unit III	**Business Communication at Workplace**	**(2 Hrs)**

Types of business letter, Characteristics of good business letter, Letter Components and Layouts, Email Communication, memo		
Unit IV	**Mindful Listening**	**(2 Hrs)**
The purpose and types of listening, Principles of effective listening, Ways to improve listening skills, Role of Active listening in professional interactions and conflict resolutions		
Unit V	**Art of Effective Verbal Interaction**	**(2 Hrs)**
Identifying common fears and anxieties related to speaking, Techniques to build confidence and overcome stage fright, Voice modulation, pitch, and pace for engaging delivery, Impromptu Speaking		
Unit VI	**Effective Body Language**	**(3 Hrs)**
Basic Principles of Body Language and Nonverbal Communication, Signs and Clusters, Kinesics & Proxemics, Gesture & Posture		

Learning Resources

Textbook:

1. Adair, John. Effective Communication. London: Pan Macmillan Ltd., 2003.

Reference Book:

1. Carnegie, Dale. The Quick and Easy Way to Effective Speaking. New York: Pocket Books, 1977.
2. Mitra, Barun. Personality Development & Soft Skills, New Delhi: Oxford Press, 2011

MOOC / NPTEL Course:

NPTEL Course “Developing Soft Skills and Personality” by Prof. T Ravichandran, IIT Kharagpur (Link of the Course: https://nptel.ac.in/courses/109104107)

Additional Web Resources: https://www.britishcouncil.in/english/online/resources-websites/moocshttps://www.dailywritingtips.com/

JSPM University Pune F.Y. M. Tech "Real Estate Valuation" Semester I		
Course Type: AEC	**Course Title:** Communicative English for Professionals	
Course Code: 230UENM01_01	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 2	**Lecture (L):** 1 **Tutorial (T):** 0 **Practical (P):** 2 **Experiential Learning (EL):** 0	**Theory (TH):** 50 Marks
Prerequisite Courses, if any: - Nil		

List of Laboratory Experiments	
Group A	
1.	Phonics
2.	Parts of Speech
3.	Presentation Skills
4.	Tenses
5.	Verbal and Non-verbal Communication
Group B	
6.	Listening Skills
7.	Reading Skill
8.	Body Language
9.	Formal Writing
10.	Email Writing
Virtual LAB Links:	

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F.Y. M. Tech "Real Estate Valuation"

Semester I

Course Type: RMC	**Course Title:** Research Methodology	
Course Code: 230IRMM01_01	**Teaching Scheme:** (Hrs. / Week)	**Examination Scheme:**
Credits: 2	**Lecture (L):** 2 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 50 marks

Prerequisite Courses, if any: -

Course Objectives:

- To develop a research orientation among the students and to acquaint them with fundamentals of research methodology, research process and research design
- To develop skills in effectively searching for relevant literature sources and familiarize with formulation of research hypotheses
- To establish an understanding of various data types, data collection methods, and the importance of research ethics and integrity.
- To acquaint students with the process of crafting research reports and thesis

Course Outcomes: On completion of the course, learner will be able to

CO1: Demonstrate Proficiency in Research Fundamentals
CO2: Identify and Frame Research Problems
CO3: Conduct Comprehensive Literature Reviews and Formulate Testable Hypotheses
CO4: Collect and Differentiate the Types of Research Data
CO5: Practice Ethical Research Conduct
CO6: Create Effective Scientific Papers Through the Application of Scientific Writing Principles

Course Contents

Unit I	**Introduction to Research**	**(5 Hrs)**
Meaning and Definition of Research, Objectives of Research, Characteristics of Research Need of Research, Importance of Research, Types of Research		
Unit II	**Problem Identification & Formulation**	**(5 Hrs)**
Research Process, Research design, Defining the Research Problem, Formulation of Research Problem, Errors in selecting Research Problem, Research Questions, Research Methods vs. Research Methodology		
Unit III	**Literature Review and Hypothesis**	**(5 Hrs)**

Literature Review Concepts and Theories, Meaning of Hypothesis and Formulation of Hypothesis, Sources of Hypothesis, Characteristics of Hypothesis, Role of Hypothesis, Tests of Hypothesis		
Unit IV	**Research Data**	**(5 Hrs)**
Sampling Design and Types and Techniques, Types of Data, Methods of Data Collection, Questionnaires, Observation Method and Interview Method, Case Study Method		
Unit V	**Ethics in Research**	**(5 Hrs)**
Ethics in conduct of Research, Ethical challenges in Data Collection, Ethical issues in scientific Publication, Plagiarism and Self-Plagiarism, Cases of Scientific Misconduct		
Unit VI	**Scientific Writing**	**(5 Hrs)**
Preparation of Title, Keywords and Methods Section, Preparation of Figures and Schematics, Citations and Referencing, Report writing and Presentation, Layout of a Research Paper, Research Journals and its Impact factor, Research Metrics.		

Learning Resources

Text Books:

1. Wayne Goddard, Stuart Melville, "*Research Methodology: An Introduction*", Juta, Lansdowne, Second Edition.
2. Ranjit Kumar "*Research Methodology*: A Step-by-Step Guide for Beginners", SAGE Publications Pvt. Ltd Fourth Edition.
3. Dr. C. R. Kothari, "*Research Methodology: Methods and Trends*", New Age International Publishers, Third Edition

Reference Books:

1. Nicholas Walliman, *"Research Methods: The Basics",* Routledge – Taylor and Francis Group, Third Edition.
2. Vinod Chandra, Anand, Hareendran "*Research Methodology*", Pearson 1st Edition
3. Dr. Prabhat Pandey, Dr. Meenu Mishra Pandey, "Research Methodology: Tools and Techniques", Bridge Center, 2015.
4. Alan Bryman & Emma Bell, "*Business Research Methods*", Oxford University Press, Third Edition.

MOOC / NPTEL Courses:

1. NPTEL Course "*Research Methodology*", Prof. Edamana Prasad, Prof. Prathap Haridoss, IIT Madras.
   Link of the Course: https://onlinecourses.nptel.ac.in/noc23_ge36/preview
2. NPTEL Course "*Research Methodology*", Prof. Soumitra Banerjee, IISER Kolkata.
   Link of the Course: https://archive.nptel.ac.in/courses/127/106/127106227/

Additional Web Resources:

1. https://www.coursera.org/learn/research-methods
2. https://www.coursera.org/specializations/data-collection
3. https://www.coursera.org/learn/introduction-to-academic-writing

JSPM University Pune F.Y. M. Tech "Real Estate Valuation" Semester I		
Course Type: LC	**Lab Course Title:** Valuation Lab	
Course Code: 230GRVM16_01	**Teaching Scheme:** (Hrs. / Week)	**Examination Scheme:**
Credits: 1	**Lecture (L):** 0 **Tutorial (T):** 0 **Practical (P):** 2 **Experiential Learning (EL):** 0	**Oral (OR):** 50 marks
Prerequisite Courses, if any: -		

List of Laboratory Experiments	
1.	Visit a real estate property and draft a report considering structural integrity, physical condition, factors affecting value, and defects influencing valuation.
2.	Prepare a report on List of documents, its collection required to carry out the valuation process.
3.	Collection of data on recent property sales and apply the comparable sales approach to estimate the value of a subject property using industry grade software.
4.	Computation of property value using industry grade software considering depreciation and land valuation for a commercial property.
5.	Computation of property value using industry grade software considering depreciation and land valuation for a residential property.
6.	Prepare a report on recent trends in Valuation.
7.	Prepare a valuation report of a residential property using industry grade software and write a report using O-1 form.
8.	Prepare a valuation report on any government-based property using industry grade software and write a report using O-1 form.
9.	Study and evaluate real estate investments considering cash flow, return on investment (ROI), and associated risks.
10.	Prepare a case study involving rental property.

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F.Y. M. Tech "Real Estate Valuation"

Semester II

Course Type: PCC	**Course Title:** Principles of Insurance and Loss Assessment	
Course Code: 230GRVM04_02	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 3	**Lecture (L):** 2 **Tutorial (T):** 1 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 100 marks

Prerequisite Courses:
Introduction to Insurance

Course Objectives:

- To demonstrate a comprehensive understanding of insurance principles, policies, and risk management techniques.
- To apply principles and legal concepts related to insurance in real-world scenarios.
- To evaluate losses, understand valuation principles, and settle claims effectively.
- To differentiate between various types of fire policies and their applications.
- To effectively prepare claims for damages due to insured perils.
- To interpret information presented in the IRDAI Annual Report.

Course Outcomes: On completion of the course, learner will be able to-

CO1: Apply insurance contract principles to evaluate policies.

CO2: Implement risk management strategies to minimize financial losses.

CO3: Manage third-party claims and assess consequential loss coverage.

CO4: Analyze fire insurance policies for property and business protection.

CO5: Verify compliance with insurer and policyholder rights and obligations.

CO6: Interpret the IRDAI Annual Report to assess industry trends.

Course Contents

Unit I	**Introduction to Insurance**	**(7 Hrs)**

Features and Function of Insurance, Principles of Insurance, principles and legal concepts in relation to insurance of buildings and plant & machinery, contract of insurance, Insurable interests and liability to insure, duties of the insurer and the insured.		
Unit II	**Insurance Policy and Risk Management**	**(8 Hrs)**
The insurance policy, terms and conditions, perils, beneficial and restrictive clauses, different types of policies, Risk and Insurance, Technicalities and classification of risk, safeguards, property protection. Importance of risk management in insurance sector and its techniques, insurance market and functions of the insurance broker.		
Unit III	**Loss Assessment**	**(8 Hrs)**
Valuation principles and techniques in relation to insurance loss assessment, valuation bases, Principles of claim settlement, Functions of the loss assessor and loss adjuster, Obligations and rights of insurer and insured, Third party claims, Consequential loss insurance, its scope and intention, policy conditions, definition of terms, approach to the consequential loss claim.		
Unit IV	**Fire Insurance Policy**	**(8 Hrs)**
Basics of Fire Insurance Policy and Engineering Policy, Fire Insurance - Origin and Nature, Principles of Fire Insurance, Policy Conditions for Fire Insurance, the types of Fire Policies - Reinstatement Value and Indemnity Policies and policies for other perils, Terms and Conditions, Perils, Beneficial and Restrictive Clauses - Value at Risk, Sum Insured and Condition of Average		
Unit V	**Miscellaneous Insurance**	**(7 Hrs)**
Over and Under Insurance, Inflation Provisions, other contents, Depreciation, Obsolescence and Betterment - Preparation of Claim for Damages due to Insured Perils. - Obligations and Rights of Insurer and Insured, Miscellaneous forms of insurance, Insurance Information Bureau of India, PRAN (Property Risk Analyzer),		
Unit VI	**IRDA Annual Report**	**(7 Hrs)**
Background and establishment of IRDA, Overview of the insurance industry in India, IRDA Annual report Structure, IRDA report for property insurance.		

Learning Resources

Text Books:

1. Scott E. Harrington and Gregory R. Niehaus. *"Risk Management and Insurance",* McGraw-Hill Education Publication, Second Edition.
2. George E. Rejda and Michael McNamara, *"Principles of Risk Management and Insurance",* Pearson Publication, Thirteenth Edition.
3. Marshall Wilson Reavis III, *"Insurance: Concepts & Coverage",* National Underwriter Company Publication, Fifth Edition.

Reference Books:

1. Dr. P. Periasamy. "*Principle of practice of Insurance",* Himalaya publishing House, 2005.
2. Inderjit Singh, Rakesh Katyal and Sanjay Arora. *"Insurance Principles and practice*", Kalyani Publishers.
3. M.N. Mishra & S.B. Mishra. *"Insurance Principles and Practice",* Sultan & Chand Publications. 22nd Edition,
4. Dr. A. Murthy. *"Elements of Insurance"*, Margham Publications.
5. E. Gordon, P.K. Gupta . "*Banking and Insurance*", Himalaya Publishing House.

MOOC / NPTEL Courses:

1. NPTEL Course, "*Fundamental of Insurance*", by Dr. K. UMA Madurai, Kamaraj University (Link for the course: https://onlinecourses.swayam2.ac.in/cec20_mg24/preview)

Additional Web Resources:

https://www.udemy.com/course/fundamentals-of-insurance/

https://www.udemy.com/course/insurance-principles-and-types-business-services- class-xi/

JSPM University Pune

F.Y. M. Tech "Real Estate Valuation"

Semester II

Course Type: PCC	**Course Title:** Advanced Surveying	
Course Code: 231GRVM05_02	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 3	**Lecture (L):** 3 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 100 marks

Prerequisite Courses, if any:
Mathematics, Surveying

Course Objectives:

- To understand the basics and elements of different types of curves on roads and their Preliminary survey
- To learn about surveying applications in setting out of curves, buildings, culverts and tunnels
- To get introduced to different geodetic methods of survey such as triangulation and trigonometric leveling
- To learn about errors in measurements and their adjustments in a traverse
- To get introduced to modern advanced surveying techniques involved such as remote sensing, Total station, GPS, Photogrammetry and drone-based aerial surveying.

Course Outcomes: On completion of the course, learner will be able to

CO1: Define and explain the basics of plane surveying and differentiate the instruments used for it.
CO2: Express proficiency in handling surveying equipment and analyse the surveying data from this equipment.
CO3: Describe the principles of photogrammetry, drone-based image acquisition and computing distances and heights using aerial photographs.
CO4: Execute curve setting for civil engineering projects such as roads, railways etc.
CO5: Articulate advancements in surveying such as space-based positioning systems
CO6: Differentiate maps and aerial photographs, also interpret aerial photographs.

Course Contents

Unit I	**Application of Theodolite Surveying**	**(7 Hrs)**
Application of Theodolite Surveying – Tachometry, Height & distance, Curve setting problems (Compound, Reverse & Transition),		
Unit II	**Traversing & Triangulation survey**	**(8 Hrs)**
Traversing & Triangulation survey: Principle, Planning & Methods. Geodesy		

Unit III	Photogrammetric Surveying	(7 Hrs)
Photogrammetric Surveying – Principle, Scale, Number of Photographs, Deduction of distance & height, Drone Technology in Aerial Photogrammetry and its Applications		
Unit IV	**Astronomical survey**	**(8 Hrs)**
Elements of Astronomical survey, Solution of problems dealing with celestial triangle.		
Unit V	**Remote Sensing and GIS**	**(8 Hrs)**
Principles of Remote Sensing & Geographic Information System, Application to Civil Engineering.		
Unit VI	**Electronic distance measurement**	**(7 Hrs)**
Electronic distance measurement, Total Station, Global Positioning System.		

Learning Resources

Text Books:

1. T. P. Kanetkar and S. V. Kulkarni, Pune Vidyarthi , *"Surveying and Levelling Vol. I and Vol. II"* by Griha Prakashan.
2. Dr. B. C. Punmia, Ashok K. Jain, Arun K. Jain, *"Surveying, Vol. I & II"* by Laxmi Publications.
3. Dr A. M. Chandra, *"Plane Surveying & Higher Surveying"* by New age international publishers New Delhi.

Reference Books:

1. Alfred Leick "*GPS Satellite Surveying" by* Wiley
2. Burrough *"Principles of Geographical Information System" by* Oxford University Press
3. M. D. Saikia *"Surveying"* PHI Learning Pvt .Ltd. Delhi
4. Satheesh Gopi, R. Sathikumar *"Advanced Surveying -Total Station, GIS and Remote Sensing"* by and N. Madhu , Pearson publication
5. R. Subramanian *"Surveying & leveling"* by, Oxford Publication.

JSPM University Pune

F.Y. M. Tech "Real Estate Valuation"

Semester II

Course Type: PCC	**Course Title:** Real Estate Management	
Course Code: 231GRVM06_02	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 2.5	**Lecture (L):** 2 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 2	**Theory (TH):** 100 Marks

Prerequisite Courses, if any: -

Course Objectives:

- To provide students with domain knowledge and expertise in the principles and framework of Real Estate design, development, management and valuation.
- To equip students to broaden scope of professional abilities through an integrated, research base approach across disciplines.
- To prepare students to face challenges, develop decision making skills, initiate entrepreneurial ventures and make a resourceful value addition.
- To enable students to be responsive and contribute to the larger spectrum of society, environment and sustainable development.

Course Outcomes: On completion of the course, learner will be able to

CO1: An ability to showcase nuances of theoretical knowledge, skill quotient, comprehension of process and application to professional practice.

CO2: An ability to critically review, assess and evaluate Real Estate based process, options, potentials and constraints in real time projects.

CO3: An ability to interpret case-based studies, engage in interdisciplinary research, publications and prepare technical documents and reports

CO4: An ability to integrate technical expertise, strategic decision making and legal mechanism to provide innovative and practical solutions.

CO5: An ability to be responsive and adapt to changing scenarios pertaining to land, development, market and environment.

CO6: An ability to contribute to holistic development solutions that are context specific and in the larger global perspective.

Course Contents

Unit I	**Basics of Real Estate**	**(5 Hrs)**
Real estate scope, classification of real estate activities and peculiarities - factors affecting real estate market - role of government in real estate market, statutory provisions, laws, rules, and regulations application,		
Unit II	**Real Estate Market**	**(5 Hrs)**

Land use controls in property development, registration and licensing requirements - knowledge base for assessment and forecasting the real estate market - environmental issues related to real estate transactions.		
Unit III	**Participants And Stake Holders**	**(5 Hrs)**
Role, scope, working characteristics and principal functions of real estate participants and stakeholders - real estate consultants and their activities - roles and responsibilities of property managers, code of ethics for real estate participants - good practices and managerial responsibilities.		
Unit IV	**Real Estate Development**	**(5 Hrs)**
Functions of real estate development like project formulation, feasibility studies, developing, costing and financing, managing including planning, scheduling and monitoring of real estate projects		
Unit V	**Forecasting The Real Estate Market**	**(5 Hrs)**
Risk management, facilities management, marketing/advertising, post construction management etc - real estate investment, sources and related issues.		
Unit VI	**Documentation**	**(5 Hrs)**
Interest rates in real estate - documentation in real estate processes - transfer of titles and title records - real estate appraisal and valuation - types of agreements between the consultants and principal - closing the real estate transactions.		

Learning Resources

Text Books:

1. Fillmore W Galaty, “Modern Real estate practice”; Dearborn Trade Publishing, New York, Third Edition
2. Gerald R Cortesi, “Mastering Real estate principles”; Dearborn Trade Publishing, New York, Second Edition

Reference Books:

1. Mike .E. Miles, “*Real estate development – Principles & Process*” Urban Land Institute, ULI, Fourth Edition
2. Richard B Peiser & Anne B. Frej, “*Professional real estate development*” – The ULI guide to the business , Urban Land Institute U.S.A, Second Edition
3. Prasad Reddy, G., and P. Mohan Reddy. "Indian Real Estate Industry: Issues And Initiatives." CLEAR International Journal of Research in Commerce & Management 6.7 (2015)
4. Dr. KR.Thooyavan. “*Human Settlements – A planning guide for beginners*”, Ma Publications, Third Edition.

JSPM University Pune **F.Y. M. Tech "Real Estate Valuation"** **Semester II**		
Course Type: MMC	**Course Title**: IOT Basics and Applications	
Course Code: 230GETM16_02	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 2	**Lecture (L):** 1 **Tutorial (T):** 0 **Practical (P):** 2 **Experiential Learning (EL):** 0	**Practical (PR):** 50 marks **Oral (OR):** 50 marks

Prerequisite Courses, if any:

1. Basic Electronics
2. Basic Electrical engineering

Course Objectives:

- The knowledge and understanding of Internet of Things
- A strong foundation of fundamentals of Internet of Things and need of IoT Security
- Get acquainted with various communication protocols of Internet of Things
- Detailed understanding of present scope of Internet of Things with case studies

Course Outcomes: On completion of the course, learner will be able to

CO1: Understand various terms related to IOT.
CO2: Understand the working of IOT devices.
CO3: Identify different types of Sensors and actuators for IOT.
CO4: Understand working of sensors and actuators
CO5: Understand the concept of various IOT Protocols
CO6: Select sensors and actuators for industrial applications

Course Contents

Unit I	**IoT**	**(2 Hrs)**
Definition and characteristics of IoT, Internet of Things: Vision, Emerging Trends, Economic Significance, Technical Building Blocks, Physical design of IoT, Things of IoT, IoT Protocols, Logical design of IoT, IoT functional blocks, IoT communication models, IoT Communication APIs, IoT enabling technologies, IoT levels and deployment templates, IoT Issues and Challenges, Applications		
Unit II	**IoT Physical Devices and Endpoints**:	**(2 Hrs)**
Basic building blocks of and IoT device, Exemplary device: NodeMCU, Aurduino, and Other IoT Devices.		
Unit III	**Sensors**	**(2 Hrs)**
Roles of Sensors & Actuators, Types of sensors, Active and passive, analog and digital, Contact and no-contact, Absolute and relative		

Unit IV	Working of Sensors	(3 Hrs)
Position, occupancy and motion, velocity and acceleration, force, pressure, flow, Acoustic, Humidity, light, radiation, temperature, chemical, biosensor, camera. Development boards		
Unit V	**IoT Protocols**	**(2 Hrs)**
MQTT, CoAP, XMPP and AMQT, IoT communication models, IoT Communication technologies: Bluetooth, BLE, Zigbee, Zwave, NFC, RFID, LiFi, Wi-Fi, Interfacing of wifi, RFID, Zigbee,NFC with development board		
Unit VI	**Applications of IOT**	**(3 Hrs)**
Smart Home: Characteristics of Smart Home - Smart Home Energy Management, Smart Appliances, Communication Technologies for Smart Homes, maintenance, security, challenges. Smart Agricultural: characteristics and applications -Scarecrow, Smart Irrigation System, Crop Water Management, Integrated Pest Management, Sensor-based field and resource mapping, Remote equipment monitoring)		

Learning Resources

Text Books:

1. Arshdeep Bahga, Vijay Madisetti, “Internet of Things – A hands-on approach”, Universities Press, ISBN: 0: 0996025510, 13: 978-0996025515 2. Honbo Zhou, “The Internet of Things in the Cloud: A Middleware Perspective”, CRC Press, 2012. ISBN : 9781439892992
2. Raj Kamal, Internet of Things: Architecture and Design Principle” , ISBN-13: 978-93-5260- 522-4, McGraw Hill Education (India) 2017

Reference Books:

1. The Internet of Things: From RFID to the Next-Generation Pervasive Networked Lu Yan, Yan Zhang, Laurence T. Yang, Huansheng Ning.
2. Designing the Internet of Things , Adrian McEwen (Author), Hakim Cassimally HakimaChouchi, “The Internet of Things Connecting Objects to the Web”, ISBN 078 -1-84821-140-7, Wiley Publications Asoke K Talukder and Roopa R Yavagal, “Mobile Computing,” Tata McGraw Hill, 2010.

MOOC / NPTEL Courses:

1. https://onlinecourses.nptel.ac.in/noc22_cs53/preview
2. https://nptel.ac.in/courses/106105166

JSPM UNIVERSITY PUNE
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State Government of Maharashtra - JSPM University Act, 2022 (Mah.IV of 2023)

JSPM University Pune F.Y. M. Tech "Real Estate Valuation" Semester II		
Course Type: MMC	**Lab Course Title**: IOT Basics and Applications	
Course Code: 230GETM16_02	**Teaching Scheme:** (Hrs. / Week)	**Examination Scheme:**
Credits: 2	**Lecture (L):** 1 **Tutorial (T):** 0 **Practical (P):** 2 **Experiential Learning (EL):**	**Practical (PR):** 50 marks **Oral (OR):** 50 marks
Prerequisite Courses, if any: -		

List of Laboratory Experiments	
Group A	
1.	Controlling GPIO pins in NodeMCU.
2.	LED blinking using Node MCU(Digital Write)
3.	Controlling LED using push button with NodeMCU (Digital Read)
4.	Temperature measurement using thermistor and NodeMCU Communication between Two NodeMCU using
5.	Smart lighting system using LDR and NodeMCU Study of smart material actuators.
Group B	
6.	Motion Detection using PIR Sensor and NodeMCU
7.	Gas detection using MQ135 and NodeMCU Experimental characterization of any one sensor.
8.	Servo motor (SG-90) control using NodeMCU Experimental characterization of DC motor
9.	Harmful gas monitoring using NodeMCU and ThingSpeak
Group C	
10.	Designing Weather station by HTTP GET REQUEST-RESPONSE using NodeMCU
11.	Design based experiment aiming selection of sensors for industrial application.

JSPM University Pune F. Y. M. Tech "Real Estate Valuation" Semester- II		
Course Type: SEC	**Course Title:** Building Information Modelling	
Course Code: 230GSEM19_02	**Teaching Scheme:**	**Examination Scheme:**
Credits: 3	**Lecture (L):** 2 Hrs./ week **Tutorial (T):** 0 Hr./ week **Practical (P):** 2 Hrs./ week	**Practical (PR): 50 Marks** **Oral (OR): 50 Marks**
Prerequisite Courses, if any: Nil		

Course Objectives:

- Familiarize students with the basic principles of Building Information Modeling (BIM) and the BIM cycle.
- Develop the skills to draw and modify fundamental building elements such as walls, windows, doors, and floors.
- Enable students to utilize advanced modification tools for efficient design adjustments.
- Provide in-depth knowledge of annotations, dimensions, and openings in architectural designs.
- Introduce students to visualization and rendering techniques for both interior and exterior.
- Guide students in developing a complete architectural project using all the learned tools and commands.

Course Outcomes: On completion of the course, learner will be able to

CO1: Demonstrate proficiency in navigating the user interface, creating building elements, defining project units, and understanding file types within the BIM context.

CO2: Create detailed building plans, manipulate wall structures, and efficiently use commands for elements like windows, doors, and roofs.

CO3: Demonstrate proficiency in using tools like array, mirror, split, and align, facilitating precise modifications and enhancements in architectural designs.

CO4: Create and manage annotations effectively, including dimensions, and various types of openings in walls.

CO5: Create realistic 3D images of a building/ structure.

CO6: Demonstrate comprehensive knowledge and application of Revit Architecture software.

Course Contents

Unit I	**Introduction to BIM and Building commands**	**(5 Hours)**

Introduction to BIM: Explaining basics about the (BIM) cycle and the basic information, Exploring User Interface, Building Elements, Project Units, Visual Styles, File types Creating Levels & Level Family, Grid creation, modifications for level and grid.

Building Command: Draw walls - Location line, draw wall shapes Drawing a plan as per Dimension Creating wall Structure Modify wall- Split Region, Sweep and Reveals Walls shapes and Openings Draw Windows & Doors, Family and edit type Create Floor & Floor Properties, Slab Edges, Place Components-Furniture Roof-by Footprint, by Extrusion, soffit, fascia, gutter Join/Unjoin Roof.

Unit II	**Building architectural drawing**	**(4 Hours)**

Creating Curtain Wall, Curtain Grid, Mullions, Adding Curtain Door Panel, Embedded walls Practice with project. Dimensions, Temporary Dimensions, Dimension settings by edit type Permanent Dimensions, creating ceiling, Opening-wall, face and vertical opening, Shaft and Dormer.

Unit III	**Modify commands & View**	**(5 Hours)**

Modify Tools: Join and cut geometry. Move, Copy, Paste, Rotate, Mirror, Array, Scale, Split Element, Trim, Align, Offset, Delete, Match Type, Tape Measure, filter, paint, match properties, keyboard shortcuts for all.
View: Elevation view, Section view,3D views, view range, section box, visibility graphics hatching Area, Colour Schemes, Keynotes, Text, Model text, Tag, Callout Views, Drafting Views.

Unit IV	**Circulation, Massing and Site**	**(6 Hours)**

Circulation: Stairs-Creating Stairs, creating stair by Sketching Runs. Creating stair by sketching Boundary and Riser, Spiral Staircase. Annotations for all related tools. Ramp, Railings and Rail Family, Modifying Rail Structure, Custom baluster, Staircase joints. Complete one project using all tools.
Massing and Site: Create Mass Family using forms, Introduction Extrusion, Loft, Sweep blend, sweep Creating Building Elements from Mass Instance, Model-in-place, Mass Floors, creating wall, Floors, Roof and curtain system, Building pad, Graded Region, Parking, Topo surface Components, sub region, split surface, contour labels

Unit V	**Sheet Composition and Rendering**	**(5 Hours)**

Sheet Composition: Schedule/Quantities Material Take Off Legend Creation Sheets-Title Blocks, Views on sheet, Print settings.
Rendering and Walkthrough: Lights-Adding Light Fixtures, Exterior Lighting-Solar Studies, sun setting, Camera and Walkthrough, Decal images, Exporting Walkthrough, Rendering, settings, customization, adjust exposure, Create realistic images for exterior and interior.

Unit VI	**Design and Insert Option and Family creation**	**(5 Hours)**

Design option, Export to CAD format
Family Creation- Door, Window, Project of interior view

Learning Resources

Text Books:

1. ASCENT, *"Autodesk Revit 2024 Architecture Fundamental"*, SDC Publication.
2. Daniel John Stine AIA, *"Interior Design Using Autodesk Revit 2014"*, SDC Publication.

Reference Books:

1. Autodesk, *"Autodesk Revit User Manual",* Autodesk

Website Links:

1. https://nptel.ac.in/courses/112102101

JSPM University Pune F. Y. M. Tech "Real Estate Valuation" Semester- II		
Course Type: SEC	**Course Title:** Building Information Modelling	
Course Code: 230GSEM19_02	**Teaching Scheme:**	**Examination Scheme:**
Credits: 3	**Lecture (L):** 2 Hrs./ week **Tutorial (T):** 0 Hr./ week **Practical (P):** 2 Hrs./ week	**Practical (PR): 50 Marks** **Oral (OR): 50 Marks**
Prerequisite Courses, if any: -		
List of Laboratory Experiments		
Group A		
1.	Hands on practice on Revit Architecture user interface	
2.	Practicing for creating walls, doors, and windows	
3.	Creating curtain walls and opening in the walls	
4.	Creating floors and roofs.	
5.	Modifying objects	
Group B		
6.	Creating dormer windows and stairs.	
7.	Hands on practice on View and Area command	
8.	Creating mass family	
9.	Sheet compositions	
Group C		
10.	Rendering and Walkthrough	

JSPM University Pune

F.Y. M. Tech "Real Estate Valuation"

Semester II

Course Type: VSC	**Course Title:** Innovation	
Course Code: 230IINB02_02	**Teaching Scheme:** (Hrs. / Week)	**Examination Scheme:**
Credits: 1.5	**Lecture (L):** 1 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 2	**Oral (OR):** 50 Marks

Prerequisite Courses, if any: -

Course Objectives:

- To understand the concept of innovation and creativity
- To familiarize with the tools for innovation
- To understand fundamentals of innovation management
- To get overview of real-world implementation of innovation and creativity

Course Outcomes: On completion of the course, learner will be able to

CO1: apply the concepts of creativity and innovation in all walks of life.
CO2: inculcate and incorporate individual creativity and innovative skill set at conceptual, product design and management level.
CO3: solve real time problems with enhanced ability in respective sectors of work for increased productivity and improved organizational behaviour.
CO4: perform with improved skill set in entrepreneurship and start up ecosystem.
CO5: to find solutions to social, corporate and personal problems with de novo approach.

Course Contents

Unit I	**Innovation & Creativity**	**(3Hrs)**

Innovation: Meaning, Concept, Characteristics, Importance, Principles of Innovation, Process of Innovation.
Creativity: Meaning, Concept, Importance, Creativity Process, Components of creative performance, Hurdles to Creativity

Unit II	**Tools for Innovation**	**(5Hrs)**

Creative Thinking: Traditional V/S Creative Thinking, Individual Creativity Techniques: Meditation, Self-Awareness, & Creative Focus Group Creative Techniques: Brainstorming, Off the Wall Thinking &Thinking Hats Method. Dimensions of Innovation: Innovation Eco-system in India and abroad, Social Innovation, Grass root Innovation, Frugal Innovation, Global Innovation- Global Innovation Index framework, GII, Case studies in India and abroad.		
Unit III	**Innovation Management**	**(3Hrs)**
Concept, Scope, Characteristics, Evolution of Innovation Management, Significance, Factors Influencing Innovation, Commercialization of Innovation, Innovation and Start up ecosystem		
Unit IV	**Areas of Innovation**	**(2Hrs)**
Innovation in Entrepreneurship, Product innovation, Process Innovation, Social Innovation, Case studies highlighting types, implementation imperatives and sector specific impact.		
Unit V	**Group innovation study**	**(1Hrs)**
Each student group will prepare a case study on one innovation topic either from their area of work or through participation in the exposition, symposia, workshop of any relevant forum. The project report will be submitted for the study.		
Unit VI	**Presentation and Closure**	**(1Hrs)**
The student group will give the presentation of the project in the chosen area. The report will highlight the process of exploring executing and exploiting the innovation. It will also mention methodology to manage the innovation.		

Learning Resources

Text Books:

1. Wagner, Tony. Creating Innovators: The Making of Young People Who Will Change the World. New York: Scribner, 2012.
2. "Managing Creativity and Innovation" Harvard Business School Press

Reference Books:

1. "Organizational Innovation", SAGE Publication, London, 2001.
2. "Jugaad Innovations, Navi Radjou and Jaideep Prabhu, Random House India
3. "Kelley, Tom, Jonathan Littman, and Tom Peters. The Art of Innovation: Lessons in Creativity from IDEO, America's Leading Design Firm. New York: Doubleday, 2001.
4. "Innovation Management & New Product Development", Paul Trott, published by Pitman, 2000.

MOOC / NPTEL Courses:

1. NPTEL Course "*Innovation, Business Models and Entrepreneurship",* Prof Rajat Agrawal, Prof Vinay Sharma, IIT Roorkee.

   Link of the Course: https://onlinecourses.nptel.ac.in/noc23_mg116/preview

Additional Web Resources:

https://youtu.be/FXJUDyqobbM
https://youtu.be/FF_38_ZuRbQ
https://youtu.be/33JjV_NDbpY
https://youtu.be/DNUwZctwwhw
https://youtu.be/_PC1qbAhKz0
https://youtu.be/wbFVNBNl7Bk
https://youtu.be/kfpERveB8kM
https://youtu.be/Y6R9ps2E1oM
https://youtu.be/66N5SM73AEc
https://youtu.be/1YLtkc6U3Rs

JSPM University Pune

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Semester II

Course Type: AEC	**Course Title:** Business Communication	
Course Code: 231UENM02_02	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 2	**Lecture (L):** 1 **Tutorial (T):** 0 **Practical (P):** 2 **Experiential Learning (EL):** 0	**Practical (PR):** 50 Marks

Prerequisite Courses, if any: Nil

Course Objectives:

- Remember the theoretical basics of Communication.
- Understand skills required for efficient interpersonal communication and leadership abilities.
- Apply Presentation Techniques in the Professional Environment.
- Analyze trends in the respective market to accommodate accordingly.
- Evaluate the skills related to production & presentation of messages in multiple formats.
- Create placement ready personalities.

Course Outcomes: On completion of the course, learner will be able to

CO1: Apply Verbal and Non-Verbal Communication Techniques in the Professional Environment

CO2: write impressive official correspondence and learn to make and give effective presentations in a professional environment.

CO 3: Write an impressive resume and face the interview confidently.

CO 4: Present themselves well in front of large audience on a variety of situations related to group communication and presentation in a relevant scenario.

CO5: Socialize with ease and comfort.

CO6: Develop Corporate Communication Skills

Course Contents

Unit I	**Employment Communication**	**(2 Hrs)**

Introduction and objectives of Report Writing, Types of Business Reports-Informational Reports, Analytical Report, Research Report, Progress Report, Explanatory Report, Structure of Reports- Title page, table of content, summary, the main body, conclusion, and recommendations, Writing Abstracts and Summaries

Unit II	**Resume Writing**	**(2 Hrs)**
Introduction to Resume Writing- Concept and Details, Types of Resume Writing- chronological and functional, Key components of effective Resume Writing, Structure and contents of Cover Letter		
Unit III	**Interview Skills / Techniques**	**(3 Hrs)**
Interview Skills / Techniques – Concept and Process, Peer Interview/Mock Interview- Pre-interview planning and performance, Opening Strategies and Answering Strategies, Interview through tele and video- conferencing		
Unit IV	**Group Discussion**	**(3 Hrs)**
Group Discussion – Concept and important points, Roles and Phases in Structured Group Discussion, Expectations of the Panel, Do's and Don'ts in Group Discussion		
Unit V	**Presentation Skills**	**(2 Hrs)**
Elements of Presentation- Content, Organization, Delivery, Design of Presentation- Typography, colour, layout, images and animation, Oral Presentations (individual or group) through JAM Sessions/Seminars/PPTs, Written Presentations through Posters/Projects/Reports/ E-mails/Assignments		
Unit VI	**Essential Soft Skills**	**(3 Hrs)**
Soft Skills development- Grooming Etiquettes and Manners, Stress and Conflict Management- Coping styles and symptoms, Time Management- Pomodoro Technique, Pareto Technique, Leadership Skills- Definition, Strategies, and Styles		

JSPM University Pune F.Y. M. Tech "Real Estate Valuation" Semester II		
Course Type: AEC	**Course Title:** Business Communication	
Course Code: 230UENM02_02	**Teaching Scheme:** (Hrs. / Week)	**Examination Scheme:**
Credits: 2	**Lecture (L):** 1 **Tutorial (T):** 0 **Practical (P):** 2 **Experiential Learning (EL):** 0	**Theory (TH):** 50 Marks
Prerequisite Courses, if any: -		

List of Laboratory Experiments	
Group A	
1.	Report Writing
2.	Resume Writing
3.	Interview technique
4.	Group Discussion
5.	Presentation Skills
Group B	
6.	Soft Skills: Grooming, Etiquettes and Manners
7.	Stress Management
8.	Time Management
9.	Leadership Skill
10.	PowerPoint Presentation

Learning Resources

Textbooks:

1. Bovee, Courtland L, John V. Thill & Barbara E. Schatzman. *Business Communication Today*: Tenth Edition. New Jersey: Prentice Hall, 2010.

Reference Books:

1. Collins, Patrick. *Speak with Power and Confidence*. New York: Sterling, 2009.
2. Barun, Mitra. Personality Development and Soft Skills, Barun K Mitra, Oxford Press, 2011.

MOOC / NPTEL Courses:

1. NPTEL Course “Soft skill Development” Prof. Priyadarshi Patnayak, Prof. V.N, Giri, Prof. D. Suar, IIT Kharagpur

Link of the course: https://youtu.be/Af9RoDvhTLE?si=cqQim2DX2Cepi0eX

Additional Web Resources:

http://www.englishdaily626.com/c-errors.php

https://www.stressdirections.com/personal/about_stress/stress_statistics.html

JSPM University Pune

F.Y. M. Tech "Real Estate Valuation"

Semester II

Course Type: RMC	**Course Title:** Research Design and Techniques	
Course Code: 230IRMM02_02	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 2	**Lecture (L):** 2 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 50 Marks

Prerequisite Courses, if any: -

Course Objectives:

- To develop the ability to create visual representations of data using appropriate tools
- To equip with various statistical techniques to draw meaningful conclusions from data
- To enable the students with the principles of experimental design, the formulation and execution of experiments
- To enable students to comprehend the concept of Analysis of Variance, and different types of ANOVA
- To develop proficiency in selecting and applying appropriate measures of association
- To acquaint students with the process of crafting research proposals

Course Outcomes: On completion of the course, learner will be able to
CO1: Demonstrate Proficiency in Data Visualization Techniques
CO2: Perform data analysis using statistical methods
CO3: Apply of Experimental Design Principles in various research contexts
CO4: Interpret research data using Analysis of Variance (ANOVA)
CO5: Demonstrate Proficiency in Measuring Associations
CO6: Develop Comprehensive Research Proposal

Course Contents

Unit I	**Data Visualization**	**5 Hrs**
Data preparation process, data presentation, data visualization techniques, effective communication of complex findings		
Unit II	**Data Analysis**	**5 Hrs**
Basic statistical concepts, measure of central tendency and variation, univariate statistics, sampling distribution, hypothesis testing		
Unit III	**Design of Experiments**	**5 Hrs**
Basics of experimental design, principles of randomization, factorial experiments, fractional factorial designs, Design of Experiments (DOE)		
Unit IV	**ANOVA**	**5 Hrs**

Introduction to ANOVA, One-way ANOVA, Two – way ANOVA, Analysis of Covariance (ANCOVA)		
Unit V	**Measures of Association**	**5 Hrs**
Simple regression, Multiple Regression, Chi square tests, Equality of proportion test		
Unit VI	**Research Proposal Development**	**5 Hrs**
Importance of research proposals in academic and professional contexts, Components of a research proposal, creating a realistic research timeline, Submitting the research proposal for funding or approval, Research proposal drafts and peer reviews		

Learning Resources

Text Books:

2. Wayne Goddard, Stuart Melville, "*Research Methodology: An Introduction*", Juta, Lansdowne, Second Edition.
3. Ranjit Kumar "*Research Methodology*: A Step-by-Step Guide for Beginners", SAGE Publications Pvt. Ltd Fourth Edition.
4. Dr. C. R. Kothari, "*Research Methodology: Methods and Trends*", New Age International (P) Limited, Publishers, Second Edition.

Reference Books:

5. Nicholas Walliman, *"Research Methods: The Basics",* Routledge – Taylor and Francis Group, Third Edition.
6. Vinod Chandra, Anand, Hareendran "Research Methodology", Pearson 1st Edition
7. Dr. Prabhat Pandey, Dr. Meenu Mishra Pandey, "Research Methodology: Tools and Techniques", Bridge Center, 2015.
8. Alan Bryman & Emma Bell, "*Business Research Methods*", Oxford University Press, Third Edition.

MOOC / NPTEL Courses:

1. "*Research Methodology*", Prof. Edamana Prasad, Prof. Prathap Haridoss, IIT Madras.

   Link of the Course: https://onlinecourses.nptel.ac.in/noc23_ge36/preview

2. "*Research Methodology*", Prof. Soumitra Banerjee, IISER Kolkata.

   Link of the Course: https://archive.nptel.ac.in/courses/127/106/127106227/

Additional Web Resources:

4. https://www.coursera.org/specializations/data-collection
5. https://www.coursera.org/learn/anova-and-experimental-design
6. https://www.coursera.org/learn/research-proposal-initiating-research

JSPM University Pune F.Y. M. Tech "Real Estate Valuation" Semester II		
Course Type: LC	**Lab Course Title:** Advanced Surveying Lab	
Course Code: 230GRVM18_02	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 1	**Lecture (L):** 0 **Tutorial (T):** 0 **Practical (P):** 2 **Experiential Learning (EL):** 0	**Practical (PR):** 50 Marks
Prerequisite Courses, if any: -		

List of Laboratory Experiments (Minimum 10)

Group A

1) Study of theodolite in detail – practice for measurement of horizontal and vertical angles.
2) Measurement of horizontal angles by method of repetition and reiteration.
3) Trigonometric leveling –heights and distances problem (Two exercises).
4) Heights and distance using principles of tachometric surveying (Two exercises).
5) Curve setting- different methods. (Two exercises)
6) Setting out works for buildings and pipe lines.
7) Determine of area using total station.
8) Traversing using total station.
9) Contouring using total station.
10) Determination of remote height using total station.
11) Stake out using total station.
12) Distance, gradient, diff, height between two inaccessible points using total station.

JSPM University Pune

F.Y. M. Tech "Real Estate Valuation"

Semester II

Course Type: IITP / FP/CEP	**Lab Course Title:** Internship / Field Projects/ Community Engagement programme	
Course Code: 230GRVM19_02	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 2	**Duration:** 4 to 6 Weeks	**Oral (OR):** 50 Marks

Prerequisite Courses, if any: -

Objectives:

- To expose students to the industrial environment, which cannot be simulated/experienced in the classroom and hence create competent professionals in the industry and understanding the social, economic and administrative considerations that influence the working environment of industrial organizations.
- To provide students with an opportunity to apply theoretical knowledge from academics to the realities of the field work/training.
- To provide practical experience in a field or discipline.

Course Outcomes: On completion of the course, learner will be able to

CO1: Develop professional competence through internship.

CO2: Apply academic knowledge in a personal and professional environment.

CO3: Build the professional network and expose students to future employees.

CO4: Apply professional and societal ethics in their day to day life.

CO5: Become a responsible professional having social, economic and administrative considerations.

CO6: Decide own career goals and personal aspirations.

Duration and Evaluation:

- Internship to be completed after every even semester (2, 4 and 6) and before commencement of next odd semester (03, 05 and 07).
- The internship should be at least 4 to 6 weeks and it is to be assessed immediately after completion.

Framework of Internship/ Field Project / Community Engagement Project:

- During the vacation after even a semester, students are ready for industrial experience. Therefore, they may choose to undergo Internship / Field Project /

Community Engagement Project

- Students may choose either to work on innovation or entrepreneurial activities resulting in start-up or undergo internship with industry/ NGO's/ Government organizations/ Micro/ Small/ Medium enterprises to make themselves ready for the industry.
- Every student is required to prepare a file containing documentary proofs of the activities done by him.
- The evaluation of these activities will be done by Programme Coordinator/ Project Head / faculty / TPO/ mentor or Industry Supervisor.

Internship Guidelines:

Step 1: The department will issue request Letter/ Email to the respective industry/ firm/ NGO/ organization to allot various slots of 4-6 weeks as internship**/** Field Project / Community Engagement Project periods for the students.

Step 2: Industry will confirm the training slots allocated for internships via Confirmation Letter/ Email.

Step 3: Students on joining Training at the concerned Industry / Organization, submit the Joining Report/ Letters / Email.

Step 4: Students undergo industrial training/ Field Project / Community Engagement Project at the concerned Industry / Organization. In- between Faculty Member(s) can evaluate(s) the performance of students once/twice by visiting the Industry/Organization and Evaluation Report of the students is submitted in department.

Step 5: Students will submit training report after completion of internship.

Step 6: Training Certificate to be obtained from industry / Organization.

Internal Reporting Guidelines for students:

- Every intern should send weekly report to their internal guide without fail. It is mandatory for the intern to send weekly reports to their respective guide on regular basis.
- Interns should have at least fortnightly verbal communication with the internal guide without fail.
- In cases where in the company wants to secure their confidential information in the project / internship report, the internal guide should duly co-ordinate with the respective mentor/reporting manager on the method of reporting to assure that no information will be leaked outside and is purely for academic purposes.

Internship Diary / Internship Workbook:

- Students must maintain Internship Diary/ Internship Workbook. The main purpose of maintaining diary/workbook is to cultivate the habit of documenting. The students

should record in the daily training diary account of the observations, impressions, information gathered and suggestions given, if any.

- The training diary/workbook should be signed after every day by the supervisor/ in charge of the section where the student has been working.
- Internship Diary/workbook and Internship Report should be submitted by the students along with attendance record and an evaluation sheet duly signed and stamped by the industry to the Institute immediately after the completion of the training.

Internship Diary / workbook may be evaluated on the basis of the following criteria:

- Proper and timely documented entries.
- Adequacy & quality of information recorded
- Data recorded.
- Thought process and recording techniques used.
- Organization of the information.

Internship Work Evaluation:

- Every student is required to prepare and maintain documentary proofs of the activities done by him / her as internship diary or as workbook.
- The evaluation of these activities will be done by Programme Coordinator/ Project Head / faculty / TPO/ mentor or Industry Supervisor based on- overall compilation of internship activities, sub-activities, the level of achievement expected, evidence needed to assign the points and the duration for certain activities.

Evaluation-Seminar presentation / Oral Examination at the institute:

The student will present a seminar based on his training report, before an expert committee constituted by the concerned department as per norms.

The evaluation will be based on the following criteria:

- Depth of knowledge and skills Communication & Presentation Skills.
- Team Work
- Creativity
- Planning & Organizational skills
- Adaptability and Analytical Skills
- Attitude & behaviour at work.
- Societal Understanding
- Ethics
- Regularity and punctuality
- Attendance record
- Log book
- Student's Feedback from External Internship Supervisor

- **Internship Report:**
- The report shall be presented covering following recommended fields but limited to:
- Title/Cover Page

- Internship completion certificate.
- Internship Place Details- Company background-organization and activities/Scope and
- object of the study / personal observation.
- Index/Table of Contents
- Introduction
- Title/Problem statement/objectives
- Motivation/Scope and rationale of the study
- Methodological details
- Results / Analysis /inferences and conclusion
- Suggestions / Recommendations for improvement to industry, if any
- Attendance Record
- List of reference (Library books, magazines and other sources)

Feedback from internship supervisor (External & Internal):

Post internship, faculty coordinator should collect feedback about student with following recommended parameters:

- Technical knowledge
- Discipline
- Punctuality
- Commitment
- Willingness to do the work
- Communication skill
- Individual work
- Team work
- Leadership

JSPM University Pune

Faculty of Science and Technology

School of Civil and Environmental Sciences

NEP aligned Syllabus

for

SY M. Tech (Real Estate and Valuation)

(Effective from AY: 2025-26)

JSPM University Pune

FACULTY OF SCIENCE & TECHNOLOGY		W. E. F	2024-2025
SCHOOL OF CIVIL AND ENVIRONMENTAL SCIENCES		RELEASE DATE	01/07/2024
SECOND YEAR MASTER OF TECHNOLOGY (REAL ESTATE VALUATION)		REVISION NO.	0.0 (NEP)

COURSE STRUCTURE (NEP 2020 Aligned)

SEMESTER III (LEVEL 7)

COURSE			TEACHING SCHEME				EXAMINATION SCHEME AND MARKS									
			Hours / Week				THEORY (Equal Weightage for CIE and ESE)				PRACTICAL (Equal Weightage for CIE and ESE)		ORAL (Equal Weightage for CIE and ESE)		TOTAL	CREDITS
TYPE	CODE	COURSE NAME	L	T	P	EL	CONTINUOUS INSEMESTER EVALUATION (100 Marks)			END SEMESTER EXAMINATION (100 / 50 Marks)	CONTINUOUS INSEMESTER EVALUATION (50 Marks)	END SEMESTER EXAMINATION (50 Marks)	CONTINUOUS INSEMESTER EVALUATION (50 Marks)	END SEMESTER EXAMINATION (50 Marks)		
							T1 (30 Marks)	T2 (30 Marks)	Assign-ments (40 Marks)							
PEC	-	Program Elective-I / MOOCs	3	-	-	-	30	30	40	100	-	-	-	-	100	3
PEC	-	Program Elective-II / MOOCs	3	-	-	-	30	30	40	100	-	-	-	-	100	3
IOC	-	Interdisciplinary Open Course -I	2	-	-	-	30	30	40	100	-	-	-	-	100	2
IOC	-	Interdisciplinary Open Course -II	2	-	-	-	30	30	40	100	-	-	-	-	100	2
VEC	230USYB01_03	Behavioral Science and Ethics	2	-	-	-	30	30	40	50	-	-	-	-	50	2
SLC	240GRVM03_03	Seminar	-	-	-	8	-	-	-	-	-	-	50	50	50	2
PROJ	240GRVM01_03	Field Project	-	-	4	8	-	-	-	-	50	50	50	50	100	4
TOTAL			**12**	**0**	**12**	**0**									**600**	**18**
MLC#		Audit Course - I	1	-	-	-	-	-	-	50	-	-	-	-	50	1

Sem.	Interdisciplinary Open Elective Course (IOC)		
	Specialization	**Management (IOC – I)**	**Computer Science (IOC – II)**
III	**Course Code**	230VBCB04_03	230GCSM31_03
	Course Name	Basics of Accounting	Artificial Intelligence for All
III	**Course Code**	230VMSM11_03	230GCSM32_03
	Course Name	Fundamentals of Financial Management	Machine Learning in Practice
III	**Course Code**	230VMSM08_03	230GCSM33_03
	Course Name	Startup and Entrepreneurship Development	Introduction to Python Programming

Sem.	Programme Elective Course (PEC)		
	Specialization	**Real Estate and Valuation**	
III (PEC – I)	**Course Code**	230GRVM07_03	230GRVM08_03
	Course Name	Principle of Economics	Advanced Town and Regional Planning
III (PEC – II)	**Course Code**	230GRVM09_03	230GRVM10_03
	Course Name	Life Cycle Cost and Value Engineering	Environmental Impact Assessment
IV (PEC – III)	**Course Code**	230GRVM11_04	230GRVM12_04
	Course Name	Real Estate Economics	Property investment and feasibility
IV (PEC – IV)	**Course Code**	230GRVM13_04	230GRVM14_04
	Course Name	Legal Aspects of Valuation	Environmental Issues in Valuation

Sem.	**Mandatory Learning Course (MLC#)- Audit Course**	
III (Audit Course - I)	**Course Code**	**230GSEM29_03**
	Course Name	**Structural Audit**
IV (Audit Course - II)	**Course Code**	**230UPOB02_04**
	Course Name	**Introduction to Indian Constitution**

Ms. Ankita Turate
Programme Coordinator, MTech-REV

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Dr. R. S. Deshpande
Dean, Faculty of Science and Technology

Dr. Anuradha S. Deshpande
Associate Dean (Academics)

Prof. B.B. Ahuja
Vice Chancellor, JSPM University Pune

	JSPM University Pune	**COURSE STRUCTURE (NEP 2020 Aligned)**	
	FACULTY OF SCIENCE & TECHNOLOGY	**W. E. F**	**2024-2025**
	SCHOOL OF CIVIL AND ENVIRONMENTAL SCIENCES	**RELEASE DATE**	**01/07/2024**
SECOND YEAR MASTER OF TECHNOLOGY (REAL ESTATE VALUATION)		**REVISION NO.**	**0.0 (NEP)**

SEMESTER IV (LEVEL 7)

COURSE			**TEACHING SCHEME**				**EXAMINATION SCHEME AND MARKS**									
			Hours / Week				**THEORY (Equal Weightage for CIE and ESE)**				**PRACTICAL (Equal Weightage for CIE and ESE)**		**ORAL (Equal Weightage for CIE and ESE)**			
TYPE	**CODE**	**COURSE NAME**	**L**	**T**	**P**	**EL**	**CONTINUOUS INSEMESTER EVALUATION (100 Marks)**			**END SEMESTER EXAMINATION (100 / 50 Marks)**	**CONTINUOUS INSEMESTER EVALUATION (50 Marks)**	**END SEMESTER EXAMINATION (50 Marks)**	**CONTINUOUS INSEMESTER EVALUATION (50 Marks)**	**END SEMESTER EXAMINATION (50 Marks)**	**TOTAL**	**CREDITS**
							T1 (30 Marks)	**T2 (30 Marks)**	**Assign-ments (40 Marks)**							
PEC	-	Program Elective-III/ MOOCs	3	-	-	-	30	30	40	100	-	-	-	-	100	3
PEC	-	Program Elective-IV/ MOOCs	3	-	-	-	30	30	40	100	-	-	-	-	100	3
PROJ	240GRVM02_04	Project/ Internship with Project	-	-	12	24	-	-	-	-	200	200	100	100	300	12
TOTAL			**6**	**0**	**24**	**0**									**500**	**18**
MLC#		Audit Course - II	1	-	-	-	-	-	-	50	-	-	-	-	50	1

Sem.	Interdisciplinary Open Course (IOC)		
	Specialization	**Management (IOC – I)**	**Computer Science (IOC – II)**
III	**Course Code**	230VBCB04_03	230GCSM31_03
	Course Name	Basics of Accounting	Artificial Intelligence for All
III	**Course Code**	230VMSM11_03	230GCSM32_03
	Course Name	Fundamentals of Financial Management	Machine Learning in Practice
III	**Course Code**	230VMSM08_03	230GCSM33_03
	Course Name	Startup and Entrepreneurship Development	Introduction to Python Programming

Sem.	Programme Elective Course (PEC)		
	Specialization	**Real Estate and Valuation**	
III (PEC – I)	**Course Code**	230GRVM07_03	230GRVM08_03
	Course Name	Principle of Economics	Advanced Town and Regional Planning
III (PEC – II)	**Course Code**	230GRVM09_03	230GRVM10_03
	Course Name	Life Cycle Cost and Value Engineering	Environmental Impact Assessment
IV (PEC – III)	**Course Code**	230GRVM11_04	230GRVM12_04
	Course Name	Real Estate Economics	Property Investment and Feasibility
IV (PEC – IV)	**Course Code**	230GRVM13_04	230GRVM14_04
	Course Name	Legal Aspects of Valuation	Environmental Issues in Valuation

Sem.	Mandatory Learning Course (MLC#)- Audit Course	
III (Audit Course - I)	**Course Code**	**230GSEM29_03**
	Course Name	**Structural Audit**
IV (Audit Course - II)	**Course Code**	**230UPOB02_04**
	Course Name	**Introduction to Indian Constitution**

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JSPM University Pune

S.Y. M. Tech "Real Estate Valuation"

Semester- III

Course Type: PEC	**Course Title:** Principle of Economics	
Course Code: 230GRVM07_03	**Teaching Scheme:** **(Hrs./Week)**	**Examination Scheme:**
Credits: 3	**Lecture (L):** 3 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 100 Marks

Prerequisite Courses, if any:

1. Introduction to Microeconomics

Course Objectives:

- To introduce basic economic concepts and their real-world applications.
- To analyze market dynamics, production, and cost structures.
- To explore macroeconomic indicators, national income, and policy impacts.

Course Outcomes: On completion of the course, learner will be able to

CO1: Explain core economic concepts like scarcity and market equilibrium.
CO2: Analyze demand, supply, and elasticity for market efficiency.
CO3: Apply production and cost theories to decision-making.
CO4: Evaluate market structures and their regulatory impacts.
CO5: Interpret national income and macroeconomic indicators in India.
CO6: Assess monetary and fiscal policy impacts on trade and exchange rates.

Course Contents

Unit I	Introduction to Economics	(7 Hrs)

Basic concepts and philosophy of economics, nature of economics as a science or an art, definitional distinctions (micro vs. macro, theories vs. models), a brief history of economic thought, techniques of economic analysis including theories, models, and tools.

Unit II	Demand, Supply, Elasticity, and Market Efficiency	(7 Hrs)

Scarcity, choice, and opportunity cost, demand and supply fundamentals, market equilibrium, consumer and producer surplus, market efficiency, elasticity of demand and supply (concepts, estimation, and applications), utility and consumer choice, indifference curve analysis, and behavioral economics as an alternative framework.

Unit III	Production and Cost	(7 Hrs)

Production theory and production functions (short-run and long-run), isoquants and MRTS, total, average, and marginal products, economies of scale and scope. Theory of costs (short-run and long-run), cost minimization, and applications in production and cost analysis.

Unit IV	Market Structure and Regulation	(8 Hrs)

Market equilibrium and price determination across various market structures, perfect and imperfect markets, welfare costs of monopoly, market efficiency, and regulatory approaches. Applications in infrastructure industries like energy and water.		
Unit V	**National Income Accounting**	**(8 Hrs)**
Methods of measuring national income (output, income, and expenditure approaches), determinants of aggregate output, price level, and interest rate through classical, Keynesian, and modern approaches. GDP estimation with a focus on India.		
Unit VI	**Macro-Economic Policies**	**(8 Hrs)**
Monetary and fiscal policy effects, evolution of Indian monetary and fiscal policies, open economy macroeconomics including balance of payments, exchange rates, and international trade with an Indian case study.		

Learning Resources

Text Books:

1. Paul A. Samuelson & William D. Nordhaus, "*Economics*," McGraw-Hill.
2. R. G. Lipsey & K. A. Chrystal, "*Economics*," Oxford University Press.
3. S. K. Mishra & V. K. Puri, "*Indian Economy: Its Development Experience*," Himalaya Publishing.

Reference Books:

1. Hal R. Varian, "*Intermediate Microeconomics: A Modern Approach*," W. W. Norton.
2. H. L. Ahuja, "*Modern Microeconomics: Theory and Applications*," S. Chand Publishing.
3. Dornbusch, Fischer, & Startz, "*Macroeconomics*," McGraw-Hill.

MOOC / NPTEL Courses:

1. NPTEL Course "*Principles of Economics*", By Prof. Sabuj Kumar Mandal, IIT Madras.

Link of the Course:

https://onlinecourses.nptel.ac.in/noc23_ec06/preview

Additional Web Resources:

https://www.udemy.com/course/principles-of-economics-101-complete-micro-macro/?

JSPM University Pune

S.Y. M.Tech " Real Estate Valuation "

Semester- III

Course Type: PEC	**Course Title:** Advanced Town and Regional Planning	
Course Code: 230GRVM08_03	**Teaching Scheme:** **(Hrs./Week)**	**Examination Scheme:**
Credits: 3	**Lecture (L):** 3 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 100 Marks

Prerequisite Courses, if any:
1. Town/Urban Planning

Course Objectives:

- Plan and design spaces for the needs of people and the function of both rural and urban communities by undertaking a critical study of socioeconomic data in relation to the spatial characteristic analysis.
- Understand the basis for zoning regulation and building bylaws in various contexts defined for neighborhood plans and master plans by using norms, guidelines, and innovative approaches.
- Understand the division of land use and distribution patterns for both rural and urban human settlements.

Course Outcomes: On completion of the course, learner will be able to-

CO1: Understand the evolution of human settlements and the philosophies guiding the early and modern Town and Country Planning with case studies.
CO2: Explain the systems of City planning in pre-& post-industrial periods.
CO3: Understand the various schools of thought guiding the theories on settlements and urban & regional planning.
CO4: Have a better understanding of Ancient, medieval and modern planning practices
CO5: Evaluate the works of prominent urban philosophers and Planning theories.
CO6: Gain a better understanding of Urban & Regional Planning techniques.

Course Contents

Unit I	**Planning History**	**(8 Hrs)**

A brief history of human settlements, from the Stone Age and milestones, in prehistoric to the historic period. Evolution of physical forms as a result of geographical, geological, climatic, social, economic, political, and technological aspects of human settlements. Ancient river valley civilizations (Egyptian, Mesopotamian, Indus valley, and Chinese). Types of plans described in Vedic Scripts (Swastika, Karmukha, Dandaka, Padmaka, etc.) Settlements and their physical forms during various dynasties up to the 18Th century and during colonization (Case studies – Jaipur, New Delhi, etc.), Town planning after independence (Case studies – Chandigarh, Gandhinagar, Amaravati, etc.).		
Unit II	**Town Planning after 18th Century**	**(7 Hrs)**
The industrial revolution, Evolution of towns as per the functions of the towns, Constraints on city form, Elements of urban structure – Networks, Buildings, open spaces, etc. The form of the modern city in the age of automobile – Inner-city & Suburban area.		
Unit III	**Utopian Concepts and Contribution of Planners**	**(7 Hrs)**
Robert Owen, Georges Eugene Haussmann, Arturo Soria Y Mata, Walter Griffin, Patrick Geddes, Patrick Abercrombie, Tony Garnier, Ebenezer Howard, Daniel Burnham, Le Corbusier, Clarence Perry, Frank Lloyd Wright, CA Doxiades, Lucio Costa. (Case studies – Garden Cities, Satellite Towns, first-generation Towns, and New Towns).		
Unit IV	**Theories of Urban Planning**	**(8 Hrs)**
Scope, purpose, and methods of Planning, the nature, and purpose of Town and Country Planning at National, Regional and local levels. Land-use planning, determinants of Land Use and spatial patterns of urban land use, Concentric Zone model, Sector model, Multiple Nuclei model, etc. The economic base of the city, the parts of the town and their relationship, planning standards, site layout and development, zoning, and Building Bye-Laws.		
Unit V	**Settlement Analysis**	**(8 Hrs)**
Methods of analysis of Socio-Economic and Physical data; Use of techniques of Location Quotient, Coefficient of Localization; Locational attributes of activity and population; Techniques for the Understanding structure of urban areas, land values, and density patterns; space standards for facility areas, utilities, and networks; Population, Distance criteria; Performance standards; Case studies.		
Unit VI	**Plan Preparation Techniques**	**(7 Hrs)**
The setting of Goals and Objectives; Methodologies for preparation of structure plan and strategy plan techniques; plan implementation techniques; public participation and plan implementation; techniques of urban renewal and central area redevelopment; Contents of a structured plan		

Learning Resources

Text Books:

1. A.E.J. Morries, "*History of Urban Form: Before the Industrial Revolution",* Routledge, New York, 3rd Edition, 1994.
2. Rangwala, "*Town planning in India"*, Charotar Book Distributors, 28th Edition, 2015.

Reference Books:

1. Stephen V. Ward, "*The Garden City: Past, present, and future*", Routledge, 2011.
2. David Adams, Urban Planning and Development process, UCL Press London, 1994.
3. Jay M Stein, "*Classic Readings in urban planning: An introduction*", McGraw- Hill, New York1994.

MOOC / NPTEL Courses:

NPTEL Course, Introduction to Urban Planning, By Prof. Harshit Sosan Lakra, IIT Roorkee
(Link of the course: https://onlinecourses.nptel.ac.in/noc21_ar12/preview)

JSPM University Pune

S.Y. M. Tech "Real Estate Valuation"

Semester- III

Course Type: PEC	**Course Title:** Life Cycle Cost and Value Engineering	
Course Code: 230GRVM09_03	**Teaching Scheme: (Hrs./Week)**	**Examination Scheme:**
Credits: 3	**Lecture (L):** 3 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 100 Marks

Prerequisite Courses, if any: Nil

Course Objectives:

- Understand the principles, components, and applications of Life Cycle Cost Analysis (LCCA) in infrastructure and real estate.
- Develop skills to evaluate project alternatives using cost-effectiveness, sustainability, and value engineering.
- Apply LCCA tools and simulations to optimize cost profiles for infrastructure and real estate projects.

Course Outcomes: On completion of the course, learner will be able to

CO1: Explain the fundamentals and significance of LCCA in project evaluation and design.

CO1: Identify and classify cost components and calculate their present value for decision-making.

CO1: Analyze and apply LCCA to various infrastructure sectors and their financial implications.

CO1: Integrate LCCA with value engineering to reduce expenditures and optimize cost structures.

CO1: Perform LCCA for real estate valuation, including energy efficiency and sustainability metrics.

CO1: Use simulations and case studies to develop cost profiles and assess project alternatives.

Course Contents

Unit I	**Introduction to Life Cycle Cost Analysis**	**(7 Hrs)**

Definition and importance of LCCA in project evaluation. Objectives of LCCA: estimating overall costs, ensuring functionality, and achieving quality at lower ownership costs. Stages of the design process where LCCA is applied. Steps in performing LCCA: determining economic impacts and quantifying alternatives in monetary terms.

Unit II	**Components of Life Cycle Cost (LCC)**	**(7 Hrs)**

Classification of costs, Initial costs, Fuel costs, Replacement costs, Operation and maintenance costs. Finance charges and residual values. Identifying relevant and significant costs in decision-making. Present value concept: base year values, future year equivalents, and discounting to base dates.		
Unit III	**LCCA in Infrastructure Development**	**(7 Hrs)**
Application of LCCA in infrastructure sectors: Residential, commercial buildings, Rail, Urban transport. Airports. Highways, Intelligent transportation systems (ITS). Ports, industrial infrastructure. Capital expenditure and operating expenses in infrastructure projects. Replacement costs and their calculation cycles. Disposal costs and their impact on LCC.		
Unit IV	**LCCA and Value Engineering**	**(8 Hrs)**
Role of LCCA in reducing expenditures through value engineering. Modelling LCCA for cost optimization: flexibility and adjustment of cost types. Financial impact assessment of project options. Tests and comparisons for improved project cost outlines.		
Unit V	**LCCA in Real Estate Valuation**	**(8 Hrs)**
Importance of LCCA for accurate real estate valuation and sustainable property management. Estimating construction, operational, and maintenance costs for buildings. Long-term value assessment for green building certifications. Impact of energy efficiency and sustainability features on life cycle costs. Payback periods. Net present value (NPV). Internal rate of return (IRR). Benefit-cost ratio.		
Unit VI	**Applications, Case Studies, and Simulations**	**(8 Hrs)**
Simulation techniques to evaluate the financial impacts across asset life phases. Case studies on successful application of LCCA in infrastructure projects. Developing cost profiles for infrastructural projects using LCCA. Comparative analyses of project alternatives using LCCA. Real estate projects demonstrating successful LCCA implementation. Analysis of property value enhancement through sustainable design choices.		

Learning Resources

Text Books:

4. Fuller, S. K., & Petersen, S. R. *"Life-Cycle Costing Manual for the Federal Energy Management Program"*. National Institute of Standards and Technology (NIST), 1995
5. Dell'Isola, A. J. "*Life Cycle Costing for Facilities"*. RS Means, 2003.
6. Boussabaine, A. H., & Kirkham, R. J. "*Whole Life-Cycle Costing: Risk and Risk Responses"*. Wiley-Blackwell, 2004.

Reference Books:

4. Langdon, D. "*Life Cycle Costing as a Contribution to Sustainable Construction"*. CIRIA, 2007.
5. Ashworth, A., & Perera, S. "*Cost Studies of Buildings"*. Routledge, 2018
6. Mishra, S. K., & Puri, V. K. "*Indian Economy: Its Development Experience"*. Himalaya Publishing House, 2020.
7. Aggarwal, A. K., & Sharma, R. K. "*Cost and Value Management in Projects"*. PHI Learning, 2012.

JSPM University Pune
S.Y. M.Tech. "Real Estate Valuation"
Semester- III

Course Type: PEC	**Course Title:** Environment Impact Assessment	
Course Code: 230GRVM10_03	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 3	**Lecture (L):** 3 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 100 Marks

Prerequisite Courses, if any:
1. Basic knowledge of environmental engineering and environmental project planning

Course Objectives:
- Understand the ecological stability and ecological systems concept and formulate the real problem due to manmade developmental activities
- Select Environmental, Economic and social indicators, collect data and conduct analysis.
- Select appropriate technique and methodology to carry out Environmental Impact Assessment

Course Outcomes: Students completing the course will be able to:
CO1: Understand the EIA as integral part of planning process
CO2: To learn the concept and methodology of EIA and its documentation.
CO3: Select Environmental, Economic and social indicators, collect data and conduct analysis for assessing the EIA
CO4: Select appropriate technique and methodology to carry out Environmental Impact Assessment
CO5: Predict and assess the impact of environment and mitigation strategies
CO6: Explore the environmental management plan and post processing of EIA

Course Contents

Unit I	**Introduction to EIA**	**(7 Hrs)**
Environment and its interaction with human activities – Environmental imbalances, attributes, impacts, Definition of environmental impact assessment (EIA), Concepts, Methodologies, Screening, Scoping, Base line studies, Mitigation, Matrices, Check list, EIA-As An Integral Part of The Planning Process.		
Unit II	**Methods for impact assessment**	**(8 Hrs)**
Background information, interaction matrix methodologies, network methodologies, etc. environmental setting various factors, environmental impact assessment methodology, documentation and selection process, environmental indices and indicators for describing affected environment, Life cycle assessment.		
Unit III	**Prediction and assessment of impact for air and noise environment**	**(8 Hrs)**

Basic information of air quality, identification of type and quantity of air pollutant, existing air quality and air quality standards, impact prediction and assessment, mitigation. Basic information of noise, existing noise levels and standards, prediction of noise levels and assessment of impact, mitigations.		
Unit IV	**Prediction and assessment of impact for water and soil environment**	**(7 Hrs)**
Basic information of water quality (Surface water and ground water), water quality standards, identification of impact, prediction of impact and assessment, mitigations. Background information of soil environment, soil and ground water standards, prediction and assessment of impact for ground water and soil, mitigations.		
Unit V	**Prediction and assessment of impact on cultural and socioeconomic environment**	**(7 Hrs)**
Basic information on cultural resources, rules and regulations for cultural resources like archaeological, historical structures, Cultural system, prediction and assessment of impact, mitigations. Basic information of socioeconomic environment, description of existing socioeconomic environment, prediction and assessment of impact, mitigation, resettlement and rehabilitation.		
Unit VI	**Environmental management plan**	**(8 Hrs)**
EIA clearance, Provisions in the EIA notification, Categorization of Industries for seeking environmental clearance from concerned authorities, environmental clearance and EIS report, Comprehensive EIA, Environmental management plan, post environmental monitoring. Case studies of EIA.		

Learning Resources

Text Books:

1. Canter R.L., "*Environmental Impact Assessment*", Mc Graw Hill International Edition, 1997.
2. John G. Rau and David C. Wooten (Ed), "*Environmental Impact Analysis Handbook"*, McGraw Hill Book Company.

Reference Books:

1. Peter Watten (Eds.) – "*Environmental Impact Assessment Theory and Practice*", Unwin Hyman, London,1988.
2. R K Jain, "Environmental Impact Analysis – A Decision Making Tool".

MOOC / NPTEL Courses:

1. Swayam Course "Environmental Impact Assessment for Environmental Health", Prof.B. Rupini & Dr. Sushmitha Baskar,
   Link of the Course: https://onlinecourses.swayam2.ac.in/nou22_bt06/preview.
2. NPTEL course "Environmental Impact Assessment", Prof. Harshit Sosan Lakra
   Link of Course: https://archive.nptel.ac.in/noc/courses/noc22/SEM1/noc22-ar07.

JSPM University Pune S.Y. M.Tech. "Real Estate Valuation" Semester- III		
Course Type: IOC	**Course Title:** Fundamentals of Financial Management	
Course Code: 230VMSM11_03	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 2	**Lecture (L):** 2 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 100 Marks

Prerequisite Courses, if any:

- Basics of Accounting
- Principles of Economics
- Business Mathematics

Course Objectives:

1. To provide an understanding of the core concepts of financial management and its importance in business decisions.
2. To equip students with the skills to analyze financial statements and understand the financial health of a business.
3. To develop the ability to make informed financial decisions and manage financial risks.
4. To introduce recent trends and industry practices in financial management.

Course Outcomes:

CO1: Explain the fundamental concepts of financial management.
CO2: Analyze financial statements to assess the financial performance of an organization.
CO3: Apply financial management techniques to make investment and financing decisions.
CO4: Evaluate financial risks and devise strategies to mitigate them.
CO5: Integrate knowledge of recent trends and industry practices in financial decision-making.
CO6: Demonstrate the ability to communicate financial information effectively.

Course Contents

Unit I	Introduction to Financial Management	(5 Hrs)

Definition, nature, and scope of financial management; Goals of financial management; Recent trends in financial management. Basic financial calculations (e.g., profit margin, return on investment)

Unit II	Financial Analysis and Planning	(5 Hrs)
Financial statement analysis; Ratio analysis; Cash flow and fund flow analysis. Calculation of financial ratios and interpretation (e.g., liquidity ratios, profitability ratios).		
Unit III	**Time Value of Money**	**(5 Hrs)**
Concept of the time value of money; Present value and future value calculations; Applications in financial decision-making. Present value and future value problems, annuity calculations, discounting cash flows.		
Unit IV	**Investment Decisions**	**(5 Hrs)**
Capital budgeting techniques; Risk analysis in capital budgeting; Recent trends in investment decisions. Net present value (NPV), Profitability Index, IRR, payback period calculations.		
Unit V	**Financing Decisions**	**(5 Hrs)**
Cost of capital; Capital structure theories and planning; Sources of long-term finance. Calculating the cost of equity, debt, and weighted average cost of capital (WACC).		
Unit VI	**Working Capital Management**	**(5 Hrs)**
Concepts and components of working capital; Management of cash, receivables, and inventory; Financing of working capital. Working capital cycle, inventory turnover ratio, receivables turnover ratio.		

Learning Resources

Text Books:

1. I.M. Pandey "*Financial Management*"
2. Richard A. Brealey, Stewart C. Myers, and Franklin Allen "*Principles of Corporate Finance*"

Reference Books:

1. Aswath Damodaran "*Corporate Finance*: *Theory and Practice*"
2. Eugene F. Brigham and Michael C. Ehrhardt "*Financial Management: Theory & Practice*"
3. David Hillier, Mark Grinblatt, and Sheridan Titman "*Financial Markets and Corporate Strategy*"
4. R. Charles Moyer, James R. McGuigan, and Ramesh P. Rao "*Contemporary Financial Management*"

MOOC / NPTEL Course:

Coursera Course on Financial Management

JSPM University Pune
S.Y. M.Tech. "Real Estate Valuation"
Semester- III

Course Type: IOC	**Course Title:** Startup and Entrepreneurship Development	
Course Code: 230VMSM08_03	**Teaching Scheme:**(Hrs./Week)	**Examination Scheme:**
Credits: 2	**Lecture (L):** 2 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 100 Marks

Prerequisite Courses, if any: -

Course Objectives:

- To understand new venture creation opportunities, its resources, and requirements for Enterprise Start-up.

Course Outcomes: On completion of the course, the learner will be able to -

CO1: Understand the fundamental concepts and characteristics of entrepreneurship.
CO2: Demonstrate the ability to generate innovative business ideas through creative thinking techniques.

CO3: Develop a comprehensive business plan, considering all essential components.

CO4: Evaluate and choose appropriate funding options for startups.

CO5: Formulate a targeted marketing strategy tailored to the identified audience.

CO6: Plan for sustainable growth and identify opportunities for scaling operations.

Course Contents

Unit I	**Introduction to Entrepreneurship and Startup Ecosystem**	**(3 Hrs)**

Definition and Characteristics of Entrepreneurship: Understanding the entrepreneurial mindset, identifying key traits of successful entrepreneurs, Importance of Entrepreneurship in the Global Economy: Exploring the economic impact of entrepreneurship, Analyzing the role of startups in innovation and job creation, Overview of the Startup Ecosystem, Types of Entrepreneurships.

Unit II	**Idea Generation and Opportunity Assessment**	**(5 Hrs)**

Creativity and Ideation- Techniques for generating innovative business ideas, Fostering a creative environment within a startup team. Market Research and Analysis- Conducting market research to identify opportunities and trends, analyzing customer

needs and preferences, Feasibility Studies- Assessing the viability of business ideas, identifying potential challenges and risks.		
Unit III	**Business Planning and Model Development**	**(6 Hrs)**
Business plan Development- Creating a comprehensive business plan, Understanding the key components of a business plan. Lean Startup Methodology- Implementing lean principles in startup development, Iterative product development and rapid prototyping. Business Model Canvas- Using the Business Model Canvas to visualize and refine business models, Identifying key value propositions and revenue streams.		
Unit IV	**Funding and Financial management**	**(6 Hrs)**
Exploring various sources of startup funding (e.g., bootstrapping, angel investors, venture capital), Understanding the pros and cons of each funding option, developing financial projections and budgets, Monitoring and managing financial performance, Methods for valuing early-stage startups, Factors influencing startup valuation.		
Unit V	**Marketing and Branding Strategies**	**(4 Hrs)**
Creating a marketing plan tailored to the target audience, utilizing digital marketing tools and social media, Importance of branding for startups, Developing a unique and compelling brand identity.		
Unit VI	**Growth, Scaling and Sustainable Business Practices**	**(6 Hrs)**
Planning for sustainable growth, identifying opportunities for scaling operations. Adapting to market changes and technological advancements. Fostering a culture of innovation within the startup, integrating sustainable practices into business operations. Examining the role of startups in social and environmental impact.		

Learning Resources

Text Books:

1. Kathleen R Allen, "*Launching New Ventures, An Entrepreneurial Approach*", Cengage Learning
2. Anjan Raichaudhuri, "*Managing New Ventures Concepts and Cases*", Prentice Hall International
3. S. R. Bhowmik& M. Bhowmik, "*Entrepreneurship"*, New Age International

Reference Books:

1. Steven Fisher, Ja-nae' Duane, "*The Startup Equation -A Visual Guidebook for Building Your Startup*", Indian Edition, Mc Graw Hill Education India Pvt. Ltd
2. Donald F Kuratko, Jeffrey S. Hornsby, "*New Venture Management: The Entrepreneur's Road Map*" Routledge

MOOC / NPTEL Courses:
NPTEL Course on "Entrepreneurship" Prof. C Bhaktavatsala Rao, IIT Madras
https://archive.nptel.ac.in/courses/110/106/110106141/
Additional Web Resources:
https://www.startupindia.gov.in/content/sih/en/learning-and-development_v2.html

JSPM University Pune
S.Y. M.Tech. "Real Estate Valuation"
Semester- III

Course Type: IOC	**Course Title:** Artificial Intelligence for All	
Course Code: 230GCSM31_03	**Teaching Scheme:**(Hrs./Week)	**Examination Scheme:**
Credits: 2	**Lecture (L):** 2 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 2	**Theory (TH):** 100 Marks

Prerequisite Courses, if any:

1. Data structures
2. Basic Programming Skills

Course Objectives:

- To understand the Historical Development and Foundations of AI
- To develop practical skills in designing and implementing search-based and decomposition-based solutions.
- To compare different approach to AI
- To master Logical and Probabilistic reasoning in AI.
- To explore use of Neural Networks in AI and understand Natural Language Processing
- To apply AI Concepts to in Civil Engineering

Course Outcomes:

On completion of the course, learner will be able to,

CO1: Describe the history and evolution of AI, including the differences between strong and weak AI and analyze the logical reasoning in AI, knowledge representation systems and expert systems.

CO2: Understand searching algorithms, heuristics in search and problem decomposition-based solutions

CO3: Understand Logical approach to AI and importance of knowledge-based system

CO4: Understand probabilistic reasoning in Artificial Intelligence

CO5: Implement natural language processing techniques for text and word relations

CO6: Understand how apply AI fundamentals in Civil Engineering

Course Contents

Unit I	**Introduction to Artificial Intelligence**	**(5 Hrs)**

History of artificial intelligence, The birth of artificial intelligence, AI Winters, Todays' AI, Historical milestones in the development of AI, Great contributors, People who have influenced AI, Differences between strong AI and weak AI, Artificial Intelligence definitions, Emergence of AI – Technological advances, AI, Functions of AI, Characteristics of artificial intelligence

Unit II	**Problem Solving using Search and Problem Decomposition**	**(5 Hrs)**
Search Algorithms: Uninformed Search Strategies, Informed Search Strategies, Comparing different search strategies, Heuristic Methods: Understanding Heuristics, Definition and role of heuristics in search, Types of heuristics, Designing Heuristic Functions, Concepts of Problem Decomposition ,Breaking down complex problems into simpler sub-problems, Hierarchical decomposition and its benefits, Techniques for Decomposition ,Applications of Decomposition ,Case studies and practical applications ,Implementation of decomposition strategies in AI, Integrating Search and Decomposition: Combining search algorithms with problem decomposition, Hybrid approaches and their applications, Practical Implementations: Real-world problems and solutions		
Unit III	**Logical Reasoning in AI and Knowledge-based System**	**(5 Hrs)**
Introduction to knowledge representation systems, Knowledge representation using logic, Propositional logic, Semantics of propositional logic, Properties of propositional logic statements, Tautologies and logical implication, Resolution, Conjunctive normal form, Resolution is valid, Resolution algorithm, Knowledgebase systems, Structure of a knowledge based system, Recap of artificial intelligence, Components of expert systems, Expert systems development, Wumpus world, Logic, A simple knowledge base, Exploring the Wumpus world, Semantic net, Inference in semantic networks, Semantic networks: Types and components, Types of relationships in semantic network, Frames, Frames: Some examples, Non-monotonic logic, Circumscription, Default logic.		
Unit IV	**Probabilistic Reasoning in Artificial Intelligence**	**(5 Hrs)**
Probability, Basic concepts, Probability of an event, Example on Sample Space, counting rules, Event relations, Conditional Probabilities, Defining Independence, The Law of Total Probability, Bayes' Rule, Examples. Random Variables, Discrete Random Variable, Probability Distributions, Probability Mass Function, Probability Density Function, Expectations of Random Variables, Medians of Random Variables, variance of a Random Variable, Quantiles of Random Variables, Jointly Distributed Random Variables, Independence and Covariance.		
Unit V	**Neural networks and Natural Language Processing**	**(5 Hrs)**
Introduction, Artificial Neural Network, Appropriate problems for neural network learning, Characteristics of the problems, Basic understanding of neural networks, A single neuron, Activation Functions, Architectures of neural networks, Feedforward neural network, Single-Layer feedforward architecture, Multiple-Layer feedforward architecture, Types of feedforward networks, multi-layer perceptron, Training MLP: The back-propagation algorithm.		
Unit VI	**Application of AI in Civil Engineering**	**(5 Hrs)**
Structural Health Monitoring, Construction Management, Geotechnical Engineering: Soil Analysis, Groundwater Management, Traffic Management and Smart Cities:		

Traffic Flow Optimization, Risk Assessment and Management: Disaster Prediction, Risk Analysis, Construction Robotics and Automation: Robotic Construction, Drones, Energy Efficiency and Sustainability, Urban Planning and Development: Analysing Population Growth, Historical Data Analysis, Water Resources Management: Demand Forecasting

Learning Resources

Textbooks:

1. Michael Negnevitsky, "*Artificial Intelligence: A Guide to Intelligent Systems*" 3rd Edition
2. David L. Poole and Alan K. Mackworth "*Artificial Intelligence: Foundations of Computational Agents*" by 3rd Edition
3. Christopher M. Bishop "*Pattern Recognition and Machine Learning*" 1st Edition
4. Charu Aggarwal "Neural Networks and Deep Learning: A Textbook", 2nd Edition

Reference Books:

1. Lane, Howard, and Hapke "*Natural Language Processing in Action*"
2. Stuart Russell and Peter Norvig "*Artificial Intelligence: A Modern Approach*"
3. Eugene Charniak and Drew McDermott "*Patterns in Artificial Intelligence: Search and Optimization*"
4. Michael J. Fischer and Dan M. Frangopol "*Artificial Intelligence in Civil Engineering: A Review*"

MOOC / NPTEL Course:

1. NPTEL Course on Artificial Intelligence: Search Methods for Problem Solving, IIT Madras, Prof. Deepak Khemani. Link: https://nptel.ac.in/courses/106106226

JSPM University Pune
S.Y. M.Tech. "Real Estate Valuation"
Semester- III

Course Type: VEC	**Course Title:** Behavioral Science and Ethics	
Course Code: 230USYB01_03	**Teaching Scheme:** **(Hrs./Week)**	**Examination Scheme:**
Credits: 2	**Lecture (L):** 2 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 50 Marks

Prerequisite Courses, if any: -

Course Objectives:

- To prepare students for their future endeavors by imparting a sense of self, understanding their surroundings and their nation.
- The course also teaches strategies to lead healthy lifestyles with a positive attitude.
- It enables students to learn the process of problem solving and creative thinking.
- In the second part of the course, the students are being prepared for their professional development by inculcating leadership skills and ethical work values.

Course Outcomes: On completion of the course, learner will be able to

CO1: Understanding sense of self, nation, and society they are living in.
CO2: Applying strategies to manage stress and understanding stress and its consequences.
CO3: Analyzing problem and Strategizing way to solve it.
CO4: Evaluating group dynamics and leadership skills.
CO5: Creating healthy and ethical workspace.
CO6: Remembering values, morality, and ethics through thick and thin of life.

Course Contents

Unit I	**Self**	**(5 Hrs)**
What is Behavioural science and its significance, Self-awareness and its importance, Components of self and self-identity, Self-concept, Self confidence, Self-image		
Unit II	**Stress Management**	**(5 Hrs)**
What is stress? and understanding reasons for stress, What are possible consequences of the stress?, How to accept stress and share your emotions, What are strategies to manage stress?, Why seeking help is important when needed?		
Unit III	**Thinking, Perceiving and Problem Solving**	**(5 Hrs)**
How to approach and analyze a problem?, How to think?, How to strategize and plan actions?, How to implement plans of action?. What is creative thinking and how to process it?		
Unit IV	**Group Dynamics and Leadership Skills**	**(5 Hrs)**

Definition and characteristics of group, What are external and internal conditions affecting group functioning?, What are group conflict and group cohesiveness?, Meaning, nature and functions of leadership, What are characteristics of a good leader?		
Unit V	**Indian Ethics**	**(5 Hrs)**
Sources of Moral Ideals in India, Ethics: Its Meaning in Indian Tradition, Ethics in Vedic Period, Ethics in Dharmasastras and Itihasas, Way of Righteousness in the Gita, Ethical Concepts of Hindu Tradition, Ethics in Buddhism, Jaina Ethics		
Unit VI	**Western Ethics**	**(5 Hrs)**
Aristotle, Thomas Aquinas, William of Ockham, Thomas Hobbes, Jeremy Bentham, Immanuel Kant, John Stuart Mill, Emile Durkheim		

Learning Resources

Textbook:

1. Bates. A. P and Jullian J “Sociology: Understanding social Behaviour”, Houghton Mifflin, 1975.

Reference Book:

1. J William Pfeiffer (ed) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer and company.
2. William Frankena K, Ethics, Prentice-Hall, Inc., 1973
   https://dorshon.com/wp-content/uploads/2018/03/Ethics.pdf

MOOC / NPTEL Course:

1. NPTEL Course: “https://onlinecourses.nptel.ac.in/noc20_hs28/preview”, Prof. Naveen Kashyap, IIT Guwahati

Other online material

Ethics notes IGNOU - https://egyankosh.ac.in/handle/123456789/4774

JSPM University Pune
S.Y. M.Tech. "Real Estate Valuation"
Semester- III

Course Type: SLC	**Lab Course Title:** Seminar	
Course Code: 230GRVM20_03	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 2	**Lecture (L):** **Tutorial (T):** **Practical (P):** 4 **Experiential Learning (EL):**	**Oral (OR):** 100 Marks

Prerequisite Courses, if any: -

Objectives:

- To develop skills in literature survey, technical writing, and oral presentation.
- To enhance communication, organization, and time management skills in a professional setting.
- To encourage critical thinking, knowledge synthesis, and presentation on contemporary issues in Construction Management.
- To build confidence in presenting technical concepts and real-life project experiences to a professional audience.
- To create an opportunity to analyze and reflect on field training or internship outcomes.

Course Outcomes: On completion of the course, learner will be able to
CO1: Conduct a structured literature survey on a relevant topic or project.
CO2: Identify, define, and frame a technical problem or theme for presentation.
CO3: Prepare a comprehensive seminar report following academic standards.
CO4: Deliver an effective oral presentation with confidence and clarity.
CO5: Demonstrate analytical thinking and communication skills.
CO6: Incorporate feedback from faculty and peers to improve their work.

Seminar Guidelines:

- Each student will select a topic related to their internship/field project, or a current trend/challenge/innovation in Construction Management.
- Topics must be approved by the Seminar Coordinator.
- Students are expected to consult journal papers, industry reports, codes, standards, and project documentation.
- A seminar report (hard and soft copy) must be submitted in the prescribed format.

Seminar Report Format (Recommended):

1. Title Page
2. Certificate from Guide
3. Acknowledgement
4. Abstract (max 300 words)
5. Table of Contents
6. Introduction
7. Objectives of the Study
8. Literature Review / Background
9. Problem Statement / Case Study Description
10. Methodology / Techniques Used / Field Observations
11. Analysis, Results, and Discussion
12. Conclusions and Recommendations
13. References (APA / IEEE style)
14. Appendices (if any)

Seminar Evaluation Criteria

1. **Seminar Report**
   - Structure and formatting (Title page, index, references, etc.)
   - Clarity of objectives and problem statement
   - Quality and depth of literature review or background study
   - Methodology or approach followed
   - Analysis, observations, or findings from case studies
   - Conclusions, recommendations, and originality/innovation
2. **Oral Presentation**
   - Communication and presentation skills
   - Depth of subject knowledge
   - Use of visual aids (PowerPoint/other media)
   - Handling of questions and audience interaction
   - Confidence, fluency, and professionalism
   - Effective time management
3. **Overall Contribution and Conduct**
   - Regularity and punctuality in meetings and submissions
   - Active participation and coordination with the guide
   - Maintenance of logbook/diary
   - Feedback from seminar guide or external/internal supervisor

Instructions for Students:

- Submit the proposed seminar topic in Week 1 of the semester.
- Attend all review meetings with your assigned guide.
- Weekly progress must be recorded and presented to the guide.
- Final seminar presentations to be conducted in Weeks 14–16 before a departmental panel.
- No plagiarism; originality will be checked and penalized if found otherwise.

JSPM University Pune **S.Y. M.Tech. "Real Estate Valuation"** **Semester- III**		
Course Type: IITP/FP/CEP	**Lab Course Title:** Field Project	
Course Code: 230GRVM21_03	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 6	**Lecture (L):** **Tutorial (T):** **Practical (P):** 12 **Experiential Learning (EL):**	**Oral (OR):** 100 Marks
Prerequisite Courses, if any: -		

Objectives:

- To identify, investigate and work on real-world industry problems.
- To develop skills in problem formulation, literature survey, methodology design, data collection, and analysis.
- To encourage independent thinking, research aptitude, and professional project documentation.
- To apply academic learning to practical engineering and management challenges.

Course Outcomes: On completion of the course, learner will be able to
CO1: Identify and define a researchable or practical problem in construction management.
CO2: Conduct an in-depth literature survey related to the topic.
CO3: Design a suitable methodology for field/project investigation.
CO4: Initiate data collection, modeling, or analysis.
CO5: Present findings and future scope effectively through a structured report and seminar.
CO6: Demonstrate time management, documentation, and communication skills.

Field Project Scope:

- Selection of problems/topic (based on industrial challenge, societal need, or academic relevance).
- Review of literature, background study, and framing of research/problem statement.
- Defining objectives, scope, and methodology.
- Preliminary data collection or case studies (if applicable).
- Submission of Project Proposal Report and Mid-Term Review Presentation.

Evaluation Criteria (Semester III - 100 Marks):

1. **Problem Identification and Relevance**
2. **Literature Survey and Technical Understanding**
3. **Project Planning, Scope, and Methodology**
4. **Preliminary Work / Case Study / Field Work Progress**
5. **Regularity, Discipline, and Interaction with Guide**
6. **Mid-Semester and Final Presentation Skills**
7. **Documentation and Project Report**

Instructions for Students (Phase I):

1. Topic Selection
   - Select a relevant, practical, or innovative topic in consultation with your assigned guide.
   - The topic may be industrial, societal, research-based, or field-oriented.
2. Proposal Preparation
   - Submit a project proposal including: problem statement, objectives, scope, review of literature, and proposed methodology.
3. Weekly Progress
   - Maintain regular contact with your internal guide (at least once a week).
   - Submit progress updates in your project logbook.
4. Mid-Semester Review
   - Present your progress in a departmental review to receive constructive feedback.
5. Interim Report Submission
   - Prepare a structured report containing proposal details, literature survey, initial work, methodology, and proposed data sources.
6. Plagiarism
   - Ensure your work is original and properly referenced. Plagiarism will result in rejection of report.
7. Final Presentation
   - Present your Phase I work before an evaluation panel and receive approval to proceed to Phase II.

JSPM University Pune

F.Y. M. Tech "Real Estate Valuation"

Semester III

Course Type: MLC	**Course Title**: Structural Audit	
Course Code: 230GSEM29_03	**Teaching Scheme:** (Hours. / Week)	**Examination Scheme:**
Credits: 1	**Lecture (L):** 1 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):**	**Theory (TH):** 50 marks

Prerequisite Courses, if any:

1.

Course Objectives:

- To explain the concept, purpose, and legal framework of structural audits for civil infrastructure.
- To familiarize students with Non-Destructive Testing (NDT) techniques, evaluation methods, and their interpretation.
- To develop skills in detailed structural assessment, condition rating, and residual life estimation.
- To understand different components of GIS and Learning about map projection and coordinate system.
- Enhance professional competency in preparing structural audit reports, managing audits, and adhering to ethical practices.

Course Outcomes: On completion of the course, learner will be able to

CO1: Describe the need, objectives, and legal provisions related to structural audits in civil engineering.

CO2: Identify and classify different types of structural distress and their probable causes in RCC, steel, and masonry structures.

CO3: Select appropriate NDT techniques, conduct tests, and interpret results for assessing structural health.

CO4: Perform detailed structural assessments, evaluate condition ratings, and estimate the residual life of structures.

CO5: Propose suitable repair and retrofitting methods based on the nature and extent of distress. **CO6:** Prepare comprehensive structural audit reports, incorporating technical findings, recommendations, and compliance with professional ethics.

Course Contents

Unit I	**Introduction to Structural Audit**	**(5 Hours)**

Concept & Importance of Structural Audit in civil infrastructure, Legal Provisions & Guidelines – National and International codes (IS 13311, IS 456, municipal requirements). Classification of Structures Requiring Audit – Residential, commercial, industrial, heritage. Stages of Structural Audit – Preliminary and detailed audit. Case examples of failures due to lack of timely audit.

Unit II	**Distress in Structures: Causes & Identification**	**(5 Hours)**
Types of structural distress – Cracks, corrosion, deflection, spalling, settlement, Causes – Material degradation, environmental effects, design faults, poor workmanship, overloading, Symptoms of Distress in RCC, steel, masonry structures, Visual inspection techniques – Checklist preparation Field photographs & video demonstrations.		
Unit III	**Non-Destructive Testing (NDT) & Evaluation Methods**	**(5 Hours)**
Types of structural distress – Cracks, corrosion, deflection, spalling, settlement, Causes – Material degradation, environmental effects, design faults, poor workmanship, overloading, Symptoms of Distress in RCC, steel, masonry structures, Visual inspection techniques – Checklist preparation, Field photographs & video demonstrations.		
Unit IV	**Detailed Structural Assessment & Condition Rating**	**(5 Hours)**
Preparation of structural drawings & documentation, Load assessment & design verification, Structural health grading & condition rating systems, Evaluation of residual life of structure, Reporting formats for structural audit.		
Unit V	**Repair & Retrofitting Techniques**	**(5 Hours)**
Principles of structural repair, Material selection – High performance concrete, FRP composites, polymer-modified mortars, strengthening methods – Jacketing, steel plate bonding, FRP wrapping, section enlargement, Foundation strengthening techniques, Waterproofing & corrosion protection, Standards & guidelines for repair execution.		
Unit VI	**Case Studies, Report Preparation & Audit Management**	**(5 Hours)**
Presentation of real-life structural audit case studies (RCC buildings, industrial sheds, bridges), Preparation of structural audit report – Executive summary, methodology, findings, recommendations, cost implications, Audit documentation for legal and municipal submission, Ethical considerations & professional responsibilities, Open discussion & Q&A session.		

JSPM University Pune

F.Y. M. Tech "Real Estate Valuation"

Semester IV

Course Type: PEC	**Course Title:** Real Estate Economics	
Course Code: 230GRVM11_04	**Teaching Scheme:** (Hrs. / Week)	**Examination Scheme:**
Credits: 3	**Lecture (L):** 3 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 100 Marks

Prerequisite Courses, if any: -
Basic Knowledge of Economics, Basic Mathematics

Course Objectives:

- To familiarize students with the foundational concepts of microeconomics and macroeconomics and their applications in the context of real estate markets and valuation.
- To develop a comprehensive understanding of market mechanisms, pricing strategies, and consumer behavior in real estate.
- To study the roles of land, labor, capital, and entrepreneurship in real estate development and valuation.
- To understand the impact of government policies, fiscal measures, and monetary strategies on real estate markets and valuation practices.

Course Outcomes: On completion of the course, learner will be able to

CO1: Explain Core Economic Principles
CO2: Analyze Demand and Supply Dynamics
CO3: Evaluate Government Interventions
CO4: Interpret Macroeconomic Indicators
CO5: Develop strategies to navigate real estate market dynamics, including business cycles, urbanization, and the impact of the parallel economy.
CO6: Identify and interpret macroeconomic and real estate market trends to predict future developments and opportunities.

Course Contents

Unit I	**Introduction to Microeconomics and Real Estate Markets**	**(7 Hrs)**

Principles of Economics: Basic concepts and scope of microeconomics, its importance in real estate valuation, Consumption: Indifference Curve, Consumer's Surplus, Elasticity of Demand (Price, Income, Cross), Price Mechanism: Determinants of price mechanism, individual and market demand schedules, law of demand and its conditions, exceptions, and limitations, Supply Mechanism: Individual and market supply schedules, conditions

and limitations, concepts of highest, lowest, and equilibrium price, importance of the time element in pricing, Market Structures: Pricing under perfect competition, imperfect competition, and monopoly.		
Unit II	**Factors of Production, Pricing, and Consumer Behaviour**	**(7 Hrs)**
Factors of Production and Their Pricing: Land (rent theories), labor (theory of wages), capital (types of capital, gross and net interest), entrepreneur (functions and theories of profit), Valuation Principles: Market value, investment value, fair value, and key valuation methods (sales comparison, cost, and income capitalization approaches), Consumer Behavior: Utility theory (cardinal and ordinal), decision-making in housing and land choices, behavioral economics in real estate.		
Unit III	**Market Dynamics and Economic Theories in Real Estate**	**(7 Hrs)**
Production and Cost Dynamics: Short-run and long-run production functions, cost concepts (fixed, variable, marginal, total), economics of scale in real estate development, Market Dynamics: Law of supply, housing and land market cycles, price fluctuations, and risk-return in real estate investments, Real Estate Pricing: Role of time element, government regulations, and pricing dynamics in perfect and imperfect markets, Case Studies: Urban land valuation, affordable housing policies, special real estate asset valuation (green buildings, heritage properties).		
Unit IV	**Introduction to Macroeconomics and Real Estate**	**(8 Hrs)**
Functions and Role of Money:Definition, Types, and Importance of Money in the Economy, Role of Money in Real Estate Transactions and Investments, National Income and Economic Growth:Concepts of GDP, GNP, and Capital Formation, Methods of Measurement (Income, Expenditure, and Value-Added), Role of Real Estate in Economic Development, Economic Indicators and Real Estate:Inflation: Types, Causes, Effects, Inflationary Gap, and Control Measures (Monetary, Fiscal, and Direct), Deflation: Causes, Effects, Deflationary Gap, and Control Measures (Deficit Financing), Real Estate Market Response to Inflation and Deflation Trends.		
Unit V	**Government Policies, Savings, Investment, and Urban Economy –**	**(8 Hrs)**
Savings and Investment: Types of Savings and Determinants, Types of Investment, Determinants, and Their Relationship with Savings, Impact of Savings and Investments on Real Estate Development and Housing Affordability, Fiscal and Monetary Policy: Role of Central Banks in Inflation and Deflation Control, Tax Policies: Property Taxes, Capital Gains Tax, and Fiscal Measures to Promote Housing, Government Expenditure and Deficit Financing: Effects on Infrastructure and Real Estate Valuation, Components of the Economy: Primary, Secondary, and Tertiary Sectors: Contributions to Economic Development, Informal Sector in Urban Economy: Role and Challenges, Parasitic Components in Urban Economy and Their Impacts on Real Estate.		
Unit VI	**Macroeconomic Trends, Parallel Economy, and Real Estate Markets**	**(8 Hrs)**
Parallel Economy: Definition, Causes, and Effects of Parallel Economy, Impact of Parallel Economy on Land Use, Real Estate Valuation, and Market Dynamics, Construction Industry and Its Link to Parallel Economy, Macroeconomic Cycles and Real Estate: Business Cycles (Boom, Recession, Recovery) and Their Impact on Real Estate Valuation, Housing Market Cycles and Price Volatility, Urbanization and Real Estate		

Economics: Urban Planning, Zoning Regulations, and Land Use Policies, Public-Private Partnerships in Real Estate Development, Case Studies and Applications: Real Estate Market Trends During Economic Crises, Parallel Economy in Real Estate: Policy Interventions and Lessons Learned.

Learning Resources

Text Books:

1. K.K. Dewett & J.D. Verma, Modern Economic Theory, Sultan Chand & Sons.
2. N. Gregory Mankiw, Principles of Microeconomics, Cengage Learning, Seventh Edition.
3. Richard T. Froyen, Macroeconomics: Theories and Policies, Pearson Education, Tenth Edition.
4. Edwin Mills & Bruce Hamilton, Urban Economics, Routledge, Eighth Edition.

Reference Books:

1. Paul A. Samuelson & William D. Nordhaus, Economics, McGraw Hill, Nineteenth Edition.
2. William J. Baumol & Alan S. Blinder, Microeconomics: Principles and Policy, Cengage Learning, Thirteenth Edition.
3. Raghuram G. Rajan, Fault Lines: How Hidden Fractures Still Threaten the World Economy, Harper Business.
4. D.N. Dwivedi, Macroeconomics: Theory and Policy, Tata McGraw Hill, Third Edition.
5. P.K. Gupta, Real Estate Valuation: Principles and Practices, S. Chand Publishing.

MOOC / NPTEL Courses:

1. **Principles of Economics**
   Platform: NPTEL
   Description: Covers foundational concepts in microeconomics and macroeconomics, emphasizing their applications in industries like real estate.
2. **Urban Land Economics**
   Platform: edX or Coursera
   Description: Explores urban economic principles, including housing markets, land-use policies, and valuation strategies.
3. **Real Estate Economics and Investment Analysis**
   Platform: MIT Open Course Ware
   Description: A detailed course on real estate markets, investment theories, and valuation approaches.
4. **Macroeconomics for Business Management**
   Platform: NPTEL
   Description: Discusses macroeconomic indicators, monetary and fiscal policies, and their relevance to business and real estate sectors.
5. **Behavioral Economics in Real Estate**
   Platform: Coursera
   Description: Focuses on how behavioral insights affect decision-making in real estate markets and housing policies.

JSPM University Pune

S.Y. M. Tech "Real Estate Valuation"

Semester- IV

Course Type: PEC	**Course Title:** Property Investment and Feasibility	
Course Code: 230GRVM12_04	**Teaching Scheme:**	**Examination Scheme:**
Credits: **Theory:** 3	**Lecture (L):** 3 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 100 Marks

Prerequisite Courses, if any: Nil

Course Objectives:

- Understand the foundational principles of property investment and feasibility analysis.
- Develop skills in financial modelling and risk assessment using real estate metrics.
- Analyze and apply taxation, financing, and risk management strategies in real-world scenarios.

Course Outcomes: On completion of the course, learner will be able to

CO1: Evaluate real estate investment strategies for diverse property types.
CO2: Use financial models like DCF to assess investment feasibility.
CO3: Conduct sensitivity and risk analyses for informed decision-making.
CO4: Analyze financing and tax impacts on real estate investments.
CO5: Prepare feasibility studies for complex property developments.
CO6: Apply case studies, portfolio management, and REIT evaluations effectively.

Course Contents

Unit I	**Fundamentals of Property Investments**	**(7 Hrs)**

Unique characteristics of real estate as an investment vehicle. Overview of real estate investment strategies: advantages and disadvantages. Impact of public and private factors on investment decisions. Understanding market efficiency and its role in real estate.

Unit II	**Basics of Financial Analysis and Cash Flow Modelling**	**(7 Hrs)**

Time value of money and its importance in real estate. Cash flow modelling: income, expenses, and leveraging. Discounted cash flow (DCF) techniques for analyzing economic viability and its relevance to property projects. Financial metrics: rentals, CAPEX, development, and operating costs. Financial indicators: Net Present Value (NPV) and Internal Rate of Return (IRR).

Unit III	**Feasibility Analysis for Investment Properties**	**(7 Hrs)**

Feasibility evaluation for residential, commercial, and industrial properties. Forecasting property value and rental income. Assessing operating history and its impact on feasibility. Sensitivity analysis: risk assessment and decision-making.		
Unit IV	**Financing and Tax Implications**	**(8 Hrs)**
The cost of borrowed money and its influence on investment returns. Credit instruments and borrowing arrangements in real estate. Fundamental income tax issues affecting property investment. Tax consequences of property acquisition, ownership, and disposal.		
Unit V	**Advanced Risk Management and Portfolio Analysis**	**(8 Hrs)**
Risk assessment in real estate investment: traditional and contemporary measures. Managing risks in a portfolio context. Evaluating feasibility and sustainability in complex projects. Case studies on risk-adjusted investment strategies.		
Unit VI	**Case Studies and Practical Applications**	**(8 Hrs)**
Real-world investment feasibility analysis and subdivision proposals. Development and rehabilitation feasibility for complex properties. Application of DCF techniques to industrial, office, and retail projects. Real Estate Investment Trusts (REITs): analysis and evaluation.		

Learning Resources

Text Books:

1. Singh, G. "*Real Estate Investment and Finance"*. McGraw Hill India, 2020.
2. Aggarwal, A. "*Real Estate Finance in India: Principles and Practice"*. Tata McGraw Hill, 2016.
3. Brueggeman, W. B., & Fisher, J. D. "*Real Estate Finance and Investments"*. McGraw Hill, 16th Edition, 2019.
4. Geltner, D., Miller, N. G., Clayton, J., & Eichholtz, P. "*Commercial Real Estate Analysis and Investments"*. Cengage Learning, 3rd Edition, 2014.

Reference Books:

1. Ling, D. C., & Archer, W. R. "*Real Estate Principles: A Value Approach"*. McGraw Hill, 5th Edition, 2022.
2. Brown, G. R., & Matysiak, G. A. "*Real Estate Investment: A Strategic Approach"*. Routledge, 2nd Edition, 2012.
3. Fisher, J. D., & Martin, R. P. "*Income Property Valuation and Feasibility Studies"*. Appraisal Institute, 2018.
4. Mishra, V. "*Real Estate Management: An Indian Perspective"*. Himalaya Publishing House, 2017.

JSPM University Pune

S.Y. M. Tech "Real Estate Valuation"

Semester- IV

Course Type: PEC	**Course Title:** Legal Aspects of Valuation	
Course Code: 230GRVM13_04	**Teaching Scheme: (Hrs./Week)**	**Examination Scheme:**
Credits: 3	**Lecture (L):** 3 **Tutorial (T):** **Practical (P):** **Experiential Learning (EL):**	**Theory (TH):** 100 Marks

Prerequisite Courses, if any:

1. Basics of Real Estate and Property Valuation

Course Objectives:

- To study real estate laws, Land Acquisition Acts, and environmental regulations.
- To explore legal, technical, and revenue documentation for property transactions.
- To apply legal principles and standards in real-world valuation scenarios.

Course Outcomes: On completion of the course, learner will be able to

CO1: Understand constitutional and administrative aspects of property valuation.
CO2: Apply property and contract laws in valuation.
CO3: Evaluate the impact of real estate laws on valuation.
CO4: Analyze financial and taxation laws affecting valuation.
CO5: Assess industrial and building regulations for valuation.
CO6: Study legal and technical documentation for property valuation.

Course Contents

Unit I	Constitutional and Administrative Framework	(7 Hrs)

Overview of the Indian Legal System, Salient features of the Indian Constitution, Fundamental Rights, Directive Principles of State Policy, and their relevance to valuation, Role of the Legislature, Executive, and Judiciary in property laws, Administrative Framework and Property Management, Urban development authorities, municipal corporations, and revenue departments, Integration of central, state, and local laws in valuation practices, Evolution of Property Rights, Historical land tenure systems and key reforms (e.g., Abolition of Zamindari, Land Ceiling Acts).

Unit II	General Property and Contract Laws	(7 Hrs)

The Indian Contract Act, 1872, Formation and enforcement of contracts, Void, voidable, and contingent contracts; fraud, misrepresentation, and breach remedies, Property Laws: The Transfer of Property Act, 1882: Sale, mortgage, lease, gift, exchange, tenancy, and their valuation impact, The Indian Easements Act, 1882: Right of way, licenses, and valuation

implications, The Indian Evidence Act, 1872: Burden of proof and its importance in valuation disputes, Registration and Stamp Duty, The Indian Stamp Act, 1899 and The Registration Act, 1908		
Unit III	**Real Estate Laws and Specific Acts**	**(7 Hrs)**
Land Acquisition Laws, Land Acquisition Act, 1894, Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation, and Resettlement Act, 2013 (LARR), Environmental and Conservation Laws, Environment (Protection) Act, 1986; Forest (Conservation) Act, 1980, Slum Areas (Improvement and Clearance) Act, 1956, Real Estate and Rent Control Laws, Real Estate (Regulation and Development) Act, 2016 (RERA), Rent control laws: Tenancy rights, eviction, and their effects on valuation, Foreign Exchange Management Act, 1999 (FEMA), FEMA Real Estate Guidelines and FDI Regulations.		
Unit IV	**Succession and Personal Laws**	**(8 Hrs)**
Inheritance Laws and Their Impact on Valuation, Hindu Succession Act, 1956, and its 2005 Amendment, Muslim Personal Law and Indian Succession Act, 1925, Concepts of will, testament, and succession certificate, Special Acts Related to Property Transfer, Government Grants Act, 1875, Limitations under the Indian Limitations Act, 1963		
Unit V	**Financial and Industrial Regulations**	**(8 Hrs)**
Banking and Financial Laws, Reserve Bank of India Act, 1934; Banking Regulation Act, 1949, SARFAESI Act, 2002; Recovery of Debts Due to Banks and Financial Institutions Act, 1993, Taxation and Valuation, Income Tax Act, 1961: Implications for property valuation, Property Tax Act: Assessment and valuation, Industrial and Special Economic Laws, Special Economic Zones Act, 2005, National Building Bye-Laws and municipal codes		
Unit VI	**Standards, Case Laws, and Reporting**	**(8 Hrs)**
International and National Valuation Standards, IVS-Defined Basis of Value: Market Value, Liquidation Value, and Premise of Value, Valuation under Companies Act, 2017, Formats for valuation reports under various regulatory frameworks, Important Case Laws in Real Estate Valuation, R.C. Cooper Vs. Union of India (1970), CWT Vs. P.N. Sikand (1977), Jawajee Nagnathan Vs. Revenue Divisional Officer (1994), Auction and Arbitration Laws, Principles of auction, vendor-purchaser rights, and misrepresentation issues, Salient features of the Arbitration and Conciliation Act, 1996, Insolvency and Bankruptcy Code, 2016, Role in valuation of distressed properties		

Learning Resources
Text Books:
1.M.P. Jain, "*Indian Constitutional Law*", LexisNexis, 2022.
2. Avtar Singh, "*Law of Contract and Specific Relief"*, Eastern Book Company, 2021.
3. R.K. Sinha, "*Transfer of Property Act*", Central Law Agency, 2020.

Reference Books:

1. S.R. Myneni, "*Real Estate Law"*, Asia Law House, 2021.
2. N.L. Mitra, "*Benami Transactions Prohibition Act"*, Taxmann Publications, 2019.
3. Narinder Kumar, "*FEMA and Foreign Exchange Management Act 1999"*, Bharat Law House, 2020.
4. T.P. Ghosh, "*The Companies Act, 2013 with Rules"*, Taxmann Publications, 2021.

MOOC / NPTEL Courses:

NPTEL Course "*Fundamentals of Legal Aspects of Business*", Dr. Mamta Brahmbhatt, Gujarat University.

Link of the Course:

https://onlinecourses.swayam2.ac.in/cec21_mg02/preview

Additional Web Resources:

https://www.coursera.org/specializations/introduction-intellectual-property

JSPM University Pune **S.Y. M. Tech "Real Estate Valuation"** **Semester- IV**		
Course Type: PEC	**Course Title:** Environmental Issues in Valuation	
Course Code: 230GRVM14_04	**Teaching Scheme:** **(Hrs./Week)**	**Examination Scheme:**
Credits: 3	**Lecture (L):** 3 **Tutorial (T):** **Practical (P):** **Experiential Learning (EL):**	**Theory (TH):** 100 Marks

Prerequisite Courses, if any: -

Course Objectives:

- To understand the impact of environmental factors on property valuation.
- To Study environmental laws and advanced valuation techniques.
- To explore sustainable practices and emerging trends in valuation.

Course Outcomes: On completion of the course, learner will be able to
CO1: Analyze how environmental factors affect property values.
CO2: Assess impacts of air, water, and land issues on valuation.
CO3: Apply environmental laws in property valuation.
CO4: Use advanced tools and methods for environmental valuation.
CO5: Develop mitigation strategies for sustainable valuation.
CO6: Explore trends like AI and blockchain in valuation practices.

Course Contents

Unit I	**Fundamentals of Environmental Valuation**	**(7 Hrs)**
Differences between market price and negative value due to environmental impacts, Influence on property values and economic assessments, Interrelation of valuation principles, environment, and economics, Real-life examples showcasing the importance of environmental considerations in valuation.		
Unit II	**Environmental Issues and Their Impact on Valuation**	**(7 Hrs)**
Air Pollution: Impact on health, property values, and urban growth, Water Pollution: Contamination, scarcity, and its effects on valuation, Other Environmental Factors: Noise, land degradation, and biodiversity loss, Diminished property value and challenges in valuation due to environmental degradation, Analysis of measures to restore damage and their influence on valuation outcomes.		
Unit III	**Legal Framework for Environmental Protection in Valuation**	**(7 Hrs)**

The Indian Forest Act, 1927, The Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act, 1981, The Environment (Protection) Act, 1986, Impact on valuation of industrial and commercial properties, Role in valuation and penalties for non-compliance		
Unit IV	**Techniques in Environmental Valuation**	**(8 Hrs)**
Market Price and Cost-to-Cure Approaches, Hedonic Pricing for environmental attributes, Contingent Valuation and Benefit Transfer methods, Incorporating environmental degradation in valuation models, GIS, remote sensing, and digital tools in environmental valuation.		
Unit V	**Mitigation and Restoration Measures**	**(8 Hrs)**
Practical measures to mitigate environmental damage, Valuation of eco-friendly, energy-efficient, and green-certified properties, Role of subsidies, carbon credits, and environmental compensation in valuation, Long-term strategies for sustainable property development and valuation.		
Unit VI	**Emerging Trends and Practical Case Studies**	**(8 Hrs)**
Analysis of properties influenced by major environmental issues (e.g., polluted industrial sites, renewable energy projects), Changes in property valuation driven by environmental laws and reforms, Role of AI, big data, and blockchain in environmental valuation, evolving standards and practices in addressing environmental issues in valuation.		

Learning Resources

Text Books:

1. Jennifer Rietbergen-McCracken, "*Environmental Valuation,"* Routledge, 1st Edition (2000).
2. Nancy E. Bockstael and Kenneth E. McConnell, *"Environmental and Resource Valuation with Revealed Preferences,"* Springer, 1st Edition (2007).
3. A. K. Enamul Haque, M. N. Murty, and Priya Shyamsundar, "*Environmental Valuation in South Asia,"* Cambridge University Press, 1st Edition (2011).

Reference Books:

8. Ken G. Willis and John T. Corkindale, "*Environmental Valuation: New Perspectives*," CABI, 1st Edition (1995).
9. Petr Mariel and Ainhoa Vega-Bayo, "*Environmental Valuation with Discrete Choice Experiments*," Springer, 1st Edition (2021).
10. Timothy C. Haab and Kenneth E. McConnell, "*Valuing Environmental and Natural Resources: The Econometrics of Non-Market Valuation*," Edward Elgar Publishing, 1st Edition (2002).
11. Claudia Trillo, "*Valuation and Sustainability: A Guide to Include Environmental, Social, and Governance Factors in Real Estate Valuation*," Springer, 1st Edition (2023).

MOOC / NPTEL Courses:

2. NPTEL Course "*Introduction to Environmental Economics*", Prof. Diptimayee Nayak, IIT Roorkee.

Link of the Course:
https://archive.nptel.ac.in/courses/109/107/109107171/

Additional Web Resources:
https://www.coursera.org/learn/environmental-law

JSPM University Pune S.Y. M. Tech "Real Estate Valuation" Semester IV		
Course Type: PROJ	**Lab Course Title:** Project	
Course Code: 230GRVM22_04	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 12	**Lecture (L):** **Tutorial (T):** **Practical (P):** 24 **Experiential Learning (EL):**	**Oral (OR):** 200 Marks
Prerequisite Courses, if any: -		

Objectives:

- To carry out in-depth field or technical investigation leading to solutions or recommendations.
- To validate methodology and refine approach through real-time analysis.
- To prepare for professional or research roles by developing complete project execution and communication skills.

Course Outcomes: On completion of the course, learner will be able t

CO1: Implement the methodology developed in Phase I.
CO2: Perform advanced analysis, modeling, or empirical study.
CO3: Interpret data and derive meaningful conclusions or insights.
CO4: Recommend practical solutions, strategies, or innovations.
CO5: Demonstrate professional reporting and presentation skills.
CO6: Exhibit teamwork, time management, and ethical standards.

Project Scope:

- Full-scale execution of field study/project/research.
- Data analysis, model testing, simulations (if applicable).
- Derivation of results, conclusions, and recommendations.
- Report writing in dissertation format.
- Final Seminar and Viva Voce.

Evaluation Criteria (Semester IV - 200 Marks):

1. Problem Definition and Continuity from Phase I
2. Execution of Methodology / Field Work / Simulation
3. Quality of Analysis, Interpretation, and Originality
4. Use of Tools, Software, or Data Modelling (if applicable)
5. Professional Project Report / Thesis Formatting

6. Interim Review Presentations
7. Final Seminar and Viva Voce
8. Discipline, Timeliness, Guide Feedback & Logbook

Instructions for Students (Phase II):

1. Work Execution
    - Carry out planned methodology including data collection, field visits, experiments, or case studies.
    - Use relevant tools, software, or modelling techniques as required.
2. Weekly Guidance & Reporting
    - Continue weekly updates to your guide and maintain project logbook.
    - Follow timelines and meet interim milestones.
3. Project Documentation
    - Your final report should include:
        - Cover Page
        - Abstract
        - Introduction
        - Literature Review
        - Methodology
        - Data Collection & Analysis
        - Results, Inferences, and Recommendations
        - Conclusion
        - References and Appendices
        - Plagiarism Check Certificate
4. Interim Review
    - Participate in mid-semester internal review to showcase progress and receive guidance.
5. Final Viva Voce
    - Present your complete project before the evaluation committee.
    - Answer queries based on your project's technical and practical aspects.
6. Professional Conduct
    - Ensure punctuality, discipline, ethical research practices, and regular communication with your guide.

JSPM University Pune

S.Y. M. Tech "Real Estate Valuation"

Semester IV

Course Type: MLC	**Course Title:** Introduction to Indian Constitution	
Course Code: 230UPOB02_04	**Teaching Scheme:** (Hrs./Week)	**Examination Scheme:**
Credits: 1	**Lecture (L):** 1 **Tutorial (T):** 0 **Practical (P):** 0 **Experiential Learning (EL):** 0	**Theory (TH):** 50 Marks

Prerequisite Courses, if any: -

Course Objectives:

- To understand the historical context and constitutional development of India, including the impact of the colonial legacy and the role of the Constituent Assembly.
- To analyse the core principles of the Indian Constitution, including the Preamble, Fundamental Rights, Fundamental Duties, Directive Principles of State Policy, and their interrelationships.
- To examine the structure of the Indian government, the process of constitutional amendments, and the role of judicial review in upholding constitutional principles.

Course Outcomes: On completion of the course, learner will be able to

CO1: Remember- Recall the historical background, key events, and figures involved in the constitutional development of India.

CO2: Understand- Explain the significance of the Preamble and the fundamental principles of the Indian Constitution, such as sovereignty, secularism, socialism, and democracy.

CO3: Apply- Demonstrate an understanding of Fundamental Rights and Duties by identifying their applications and limitations in real-world scenarios.

CO4: Analyse- Analyse the relationship between Fundamental Rights and Directive Principles of State Policy, and how they interact to shape governance in India.

CO5: Evaluate- Assess the effectiveness of significant constitutional amendments and the role of judicial review in maintaining the integrity of the Indian Constitution.

CO6: Create- Develop a coherent argument or proposal for a constitutional amendment or policy change, grounded in the principles and structure of the Indian Constitution.

Course Contents		
Unit I	**Historical background**	**(3 Hrs)**
Colonial legacy, Constitutional development, The constituent assembly		
Unit II	**Preamble and fundamental principles**	**(2 Hrs)**

The Preamble, Sovereignty, Secularism, Socialism, and Democracy, Justice, Liberty, Equality, and Fraternity		
Unit III	**Fundamental Rights and Duties**	**(3 Hrs)**
Fundamental rights, Fundamental duties, Restrictions and amendments		
Unit IV	**Directive Principles of State Policy**	**(3 Hrs)**
Definition and purpose, Classification, Relationship with fundamental rights		
Unit V	**Organs of the Government**	**(2 Hrs)**
Union and state governments, The President and Prime minister, Parliamentary system		
Unit VI	**Amendments and Judicial Review**	**(2 Hrs)**
Amendment process, Significant amendments, Judicial review		

Learning Resources

Textbooks:

1. Basu, D. D., *Introduction to Constitution of India*, Prentice Hall of India, 1989
2. M. P. Jain, Indian Constitutional Law, LexisNexis, 2020

Reference Books:

1. Granville Austin The Indian Constitution: Cornerstone of a Nation, Oxford University Press, 1966
2. Mahendra Pal Singh, Shukla's Constitution of India, Eastern Book Company, 2019
3. Rajani Goyal, Modern Constitutions, RBSA Publications, 2023
4. Sukhbir Bhatnagar, Constitutional Law and the Governance, Mittal Publications, 2008

MOOC / NPTEL Courses:

1. Swayam: Constitutional Law **Link of the Course:** Constitutional Law, Aneeda Jan

Additional Web Resources: Constitution of India