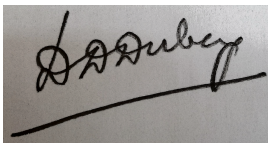
CURRICULUM

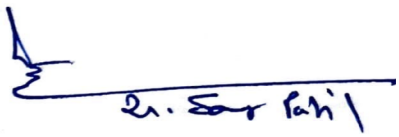
Master of Business Administration (Construction Project Management)

July 2025

Certificate

It is hereby certified that the enclosed detailed syllabus has been presented before the Board of Studies of Amity University Mumbai on **26th June 2024** and it is recommended for the approval by the Academic Council, Amity University Mumbai.





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Date: 15th July 2025

TABLE OF CONTENTS

Vision Mission and Values

Vision:

To be a world-class academic institution engaged in the creation of globally competent professionals and add value to the development of a sustainable built environment

Mission:

M1 Deliver an outstanding student experience

M2 Bridge the skills gap by shaping employment-ready professionals

M3 Exhibit excellence in research and teaching

M4 Demonstrate ongoing relevance to the industry

M5 Retain thought leadership in the built environment sector

M6 Produce global professionals with integrity and competence in keeping with RICS standards

Values:

- Professionalism
- Integrity
- Leadership

Program Education Objectives

PEO1 To impart leadership, knowledge of the fundamentals of Project Management and Real Estate theory and its application in problem-solving and decision-making.

PEO2 To instill the necessary skills to select, analyse, and apply appropriate tools and techniques for decision-making required for solving complex managerial problems in construction and real estate projects.

PEO3 To develop sound knowledge of business strategy and entrepreneurship and inculcate creativity and innovation along with applied research in the field of construction and real estate among students.

PEO4 To graduate employable students, having the highest regard for professional ethics, social responsibility, sustainability, teamwork, and continuous learning.

PEO5 To develop the ability for efficient utilization of organization resources, planning, and execution of real estate and infrastructure projects.

Program Outcomes (POs)

PO1 Apply knowledge of management theories and practices to solve business problems.

PO2 Foster Analytical and critical thinking abilities for data-based decision-making.

PO3 Ability to develop Value-based Leadership ability.

PO4 Ability to understand, analyse, and communicate global, economic, legal, and ethical aspects of business.

PO5 Ability to lead themselves and others in the achievement of organizational goals,contributing effectively to a team environment.

PO6 Ability to select and apply appropriate strategic management frameworks to business organization.

PO7 Apply the knowledge of sustainable development and CSR for policy formulation and implementation in the business.

PO8 Ability to engage in independent and life-long learning on changes and advances happening in the business world.

Program Specific Outcomes (PSOs)

PSO1 Utilizing acquired knowledge and skills in a range of construction project management and real estate activities, both directly and indirectly, at both domestic and global levels by actively planning and executing projects.

PSO2 Develop skills to acquire mastery in various competencies related to Construction and Real Estate sector such as, inspection, due diligence, design, experimentation, BIM, Lean Practices, Project Management, Health and Safety, measurement of land and property, analysing development feasibility, valuation, property portfolio management and market analysis.

PSO3 Application of economic principles as they apply to real estate, land and property laws, environment laws, planning, construction technology, valuation methods, property

development process, property management, investment and finance related to real estate and construction sector.

PSO4 Application of principles of urban development, accounting, corporate law, marketing, and finance as appropriate to real estate and construction business.

Career Pathways

MBA in Construction Project Management (MBA-CPM) would open several career avenues for the graduates. They would be able to take up job roles in the following key areas of construction, real estate and urban infrastructure.

- Project Management
- Quantity surveying
- Cost Management
- Risk Management
- Contract Administration
- Contract Practice
- Business Development
- Infrastructure Project Development
- Design Management
- Facilities Management
- Building Information Modelling
- Lean Construction
- MEP Services
- Precast Construction
- Value Engineering
- Building Management Systems

RICS Pathways and Competency Matrix

This curriculum for MBA-CPM would address Project Management pathway of RICS. The program structure and various courses would deal with this pathway and would give sound educational background to students to build their career in Built environment sector and aspire for RICS qualification.

Program Structure

FIRST SEMESTER

S. No	Course Code	Course Name	Type	L	T	P	SW	IV/FW	Credits
1	AUMREAL662	Fundamentals of Management Science	CC	2	1	0	0	0	3
2	AUMCM663	Sustainable Practices in Built Environment	CC	2	0	0	0	0	2
3	AUMREAL660	Accounting and Finance for Built Environment	CC	2	2	0	0	0	4
4	AUMREAL661	Economics for Built Environment	CC	2	1	0	2	0	4
5	AUMCM662	Project Development and Pre-Construction Planning	CC	3	0	0	2	0	4
6	AUMCM774	Construction Methods and Technology	FS	2	1	0	2	0	4
7	AUMBC606	Business Communication for Built Environment	VAC	2	1	0	2	0	4
		TOTAL		**15**	**6**	**0**	**8**	**0**	**25**
***Foreign Business Language – I (Optional)**									

SECOND SEMESTER

S. No	Course Code	Course Name	Type	L	T	P	SW	IV/FW	Credits
1	AUMREAL665	Data Analytics for Built Environment	CC	2	1	0	0	0	3
2	AUMREAL668	Principles of Asset Valuation	CC	2	2	0	0	0	4
3	AUMCM776	Construction Project Planning and Scheduling	FS	2	0	2	0	1	4
4	AUMCM769	Procurement and Tendering	CC	2	1	0	0	0	3
5	AUMCM775	Business Development and Marketing Management	CC	2	1	0	0	0	3
6	AUMCM665	Cost Planning and Management	CC	2	1	2	0	0	4
7	AUMREAL649	Organisational Behavior and Human Resources Management	VAC	2	1	0	2	0	4
		TOTAL		**14**	**7**	**4**	**4**	**0**	**25**
***Foreign Business Language – II (Optional)**									

L-Lecture**, T-** Tutorial, **P**-Practical, **SW**-Self Work, **IV-** Industrial Visit, **FW**-Field Work

THIRD SEMESTER

S. No	Course Code	Course Name	Type	L	T	P	SW	IV/FW	Credits
1	AUMCM779	Construction Contracts and Dispute Management	CC	2	1	0	0	0	3
2	AUMCM773	Management of Building Services	SE	2	1	0	0	0	3
3	AUMCM771	Project Monitoring and Control	SE	2	0	2	0	0	3
4		Elective – I	SE	2	2	0	2	0	5
5		Elective – II	SE	2	2	0	2	0	5
6	AUMBC705	Professional Writing for Built Environment	VAC	2	1	0	2	0	4
7	AUMMSCP601	Capstone Project – I	NTCC	0	0	0	0	6	3
8	AUMMSS600	Summer Internship	NTCC	0	0	0	0	6	3
		TOTAL		**12**	**7**	**2**	**6**	**12**	**29**
***Foreign Business Language – III (Optional)**									

FOURTH SEMESTER

S. No	Course Code	Course Name	Type	L	T	P	SW	IV/FW	Credits
1	AUMCM770	Building Information Modelling and Management	CC	1	0	2	0	0	2
2	AUMCM780	Quality, Health and Safety Management	SE	2	1	0	0	0	3
3	AUMCM791	Risk Management in Construction Projects	CC	1	1	0	0	0	2
4		Elective – III	SE	2	2	0	2	0	5
5		Elective – IV	SE	2	2	0	2	0	5
6	AUMBS705	Professional Practice and Ethics	VAC	2	1	0	2	0	4
7	AUMMSCP602	Capstone Project – II	NTCC	0	0	0	0	12	6
		TOTAL		**10**	**7**	**2**	**6**	**12**	**27**
***Foreign Business Language – IV (Optional)**									

		TOTAL CREDITS							**106**

L-Lecture**, T-** Tutorial, **P**-Practical, **SW**-Self Work, **IV-** Industrial Visit, **FW**-Field Work

LIST OF SPECIALISATION ELECTIVES

Electives				
Specialization Electives				Offered in
		Domain Electives		
1	AUMCM785	Lean Construction Practices	DE	3/4 Sem
2	AUMCM787	Dispute and Conflict Avoidance in Construction management	DE	3/4 Sem
3	AUMCM788	International Practices in Measurement and Contracts	DE	3/4 Sem
4	AUMCM790	Health and Safety Management in Construction	DE	3/4 Sem
5	AUMCM781	Operations Research for Built Environment	DE	3/4 Sem
6	AUMCM782	**Digital Built Environment**	DE	3/4 Sem
7	AUMCM783	Cost Management for PPP projects	DE	3/4 Sem
8	AUMCM784	International Construction Project Finance	DE	3/4 Sem
		Open Electives		
9	AUMCM793	Energy Management for Built Environment	OE	3/4 Sem
10	AUMREAL798	Due Diligence, Capital Allowances and Insurance	OE	3/4 Sem
11	AUMCM786	Claims and Change Management	OE	3/4 Sem
12	AUMREAL706	Urban Infrastructure Management	OE	3/4 Sem
13	AUMREAL708	Advanced Real Estate Valuations	OE	3/4 Sem
14	AUMREAL707	Marketing Communication and CRM	OE	3/4 Sem
15	AUMREAL717	Advanced Facilities Management	OE	3/4 Sem
16	AUMREAL799	Planning and Development of special real estate projects	OE	3/4 Sem
17	AUMREAL792	Project and Mortgage Finance for Built Environment	OE	3/4 Sem
18	AUMREAL711	Valuation of Special Projects	OE	3/4 Sem
19	AUMREAL800	Environment and Social Impact Assessment of Real Estate Project	OE	3/4 Sem
20	AUMREAL710	Valuation of Businesses and Intangible Assets	OE	3/4 Sem
21	AUMREAL797	Future Cities	OE	3/4 Sem
22	AUMCM794	Digital Technologies and Social Media Marketing	OE	3/4 Sem
23	AUMREAL796	Advanced Finance Management	OE	3/4 Sem
24	AUMREAL791	Entrepreneurship in Built Environment	OE	3/4 Sem

Course Type				
CC	Core Course		DE	Domain Electives
FS	Functional/Sectoral		OE	Open Electives
SE	Specialization Elective		SEC	Skill Enhancement Courses
VAC	Value-Added Courses		NTCC	Non-Teaching Credit Courses

SEMESTER - 1

Fundamentals of Management Science

Course Title	:	Fundamentals of Management Science
Course Code	:	AUMREAL662
Credit Units	:	3

L	T	P	SW	FW	Total Credits
2	1	0	0	0	3

Course Objective	:	To provide fundamental knowledge of businesses, their functions and processes and develop an overall understanding of business organizations in today's global economy, especially in the "Built Environment" scenario.

Pre-requisites	:	None

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	CO1. Demonstrate the understanding pertaining to issues related to management of an organization CO2. Demonstrate the understanding pertaining to issues related to management of stakeholders of an organization CO3. Explain aspects of management of organization in Built Environment sector CO4. Explain aspects of management of stakeholders of an organization in Built Environment sector CO5. Understand various aspects of management of organization CO6. Evaluate the impact of various aspects of management of organization on its effectiveness

Course Syllabus:

Modules	Weightage (%)
Module I : Business Value Creation	**10%**

Definition of business, Value creation, Global trends pertaining to business environment and specifically Built Environment sector – Opportunities and Challenges	
Module II: Management Principles, functions, and Concepts	**30%**
Evolution of Management (theories and approaches- Fayol, Webber etc.), Management Functions-POLC framework, Understanding The organization and its design , Organizational culture, Typical organizations in Built Environment, Organization Strategy, Goals , values, ethics and Structure, Corporate Culture and Ethics in a Global environment Organizational conflicts- power and politics, Organizational decision making, Understanding the role of a manager and a leader, Organizational Metrics	
Module III: Contemporary issues in management	**30%**
Managing organizational communication-Information and Control Processes, Organizational Innovation and managing change, Managing Equity and diversity, Knowledge management	
Module IV: Impact of External Environment- Stakeholder Management	**30%**
Stakeholder Theory, Freeman's Model, Stakeholder, Stake-watcher, and Stake-keeper, Stakeholder view of the Firm and Project PMBOK concepts pertaining to stakeholder management (Identify Stakeholders, Plan Stakeholder Management, Manage Stakeholder Engagement, and Control Stakeholder Engagement.) Public Engagement Process, Social analysis- CLIP tool, Information and Communication Management Systems for Stakeholder Management, Value creation for stakeholders-Client Care, Corporate Social Responsibility, Resettlement and Rehabilitation.	

Pedagogy for Course Delivery	:	Theoretical concepts shall be imparted during lecture and tutorials. Cases, discussions and assignments shall be used for anchoring of concepts and to elaborate practical application.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100%	0%

Theory Assessment:

Continuous Assessment / Internal Assessment	**End Term Examination**

Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	15
Self-Work	30
Field Work	0
Assessment	15
Total Hours	**90**

Text & References:

Textbooks

1. Richard, L.D., 2013. *Understanding the Theory and Design of Organizations*. South-Western CENGAGE Learning

References Books:

1. PMBOK, Articles on Stakeholder Management

Any Other Study Material:

1. Cases given during class

Sustainable Practices in Built Environment

Course Title	:	Sustainable Practices in Built Environment
Course Code	:	AUMCM663
Credit Units	:	2

L	T	P	SW	FW	Total Credits
2	0	0	0	0	2

Course Objective	:	This subject aims to provide an insight into important sustainability principles in the built environment. Specifically, students will gain a systematic understanding and critical awareness of sustainability concepts, policy actions, environmental assessment tools, building construction methods and key property sustainability debates and their relevance to a range of stakeholders in the built environment.

Pre-requisites	:	None

Student Learning Outcomes (SLO)/Course Outcome (CO)	:	CO1. Understand sustainability, the need for sustainability and the importance of the sustainability movement. CO2. Apply sustainability in the built environment through compliance with green legislation and certification. CO3. Create sustainable solutions in the design, development, maintenance, and operation. CO4. Analyze factors that are relevant to the stakeholder groups to promote sustainability in organizational decision making. CO5. Implement sustainable building technologies and innovations. CO6. Assess and communicate the social, environmental, and economic benefits of sustainable practices.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module -I: Principles of Sustainability	**25%**
Introduction to sustainability; Sustainability models, concepts, and principles; Key international accords; Key institutions; Green building certification systems (LEED, GRIHA, IGBC, others); NBC 2016 chapter on sustainability; Sustainable consumption; Sustainability metrics to guide decision making; environmental laws.	
Module -II: Importance of sustainability in real estate	**20%**
Insight into various mandatory and voluntary eco-labels for new and existing buildings in the built environment and their key characteristics. Critical understanding of significant drivers that facilitate the implementation of sustainability in the built environment and their importance	
Module -III: –Sustainable materials and construction methods	**40%**
Sustainability in the property industry throughout real estate life cycles, including how the concept is relevant and manifests itself at various life cycle stages, i.e. development, design, construction, operation, refurbishment and retrofitting. Techniques of water conservation in building; Effective plumbing methods; Landscape irrigation techniques; Green construction materials; C&D recycling; Use of local materials; Embodied energy; Sustainable material selection criteria: communication and management of documentation	
Module -IV: Sustainability in organizational decision making	**25%**
Drivers and barriers for the adoption of sustainable practices in the property industry, which includes the business case for sustainability. Critical awareness of a range of views from key stakeholders on the importance of sustainability in real estate practices. Business strategy for sustainability; Inclusion in scope of work and specifications; Role of green building professionals in the built environment	

Pedagogy for Course Delivery	:	Theoretical concepts shall be imparted during lecture and tutorials. Cases, discussions and assignments shall be used for anchoring of concepts and to elaborate practical application.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**

100%	0%

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	0
Self-Work	15
Field Work	0
Assessment	15
Total Hours	**60**

Text & References

Textbooks

1. *Modern Construction: Lean Project Delivery and Integrated Practices*, Lincoln H. Forbes and Syed M. Ahmed
2. Reading material as provided during the lectures

Reference Books

1. Goldratt, Eliyahu M. and Jeff Cox "*The Goal: A Process of Ongoing Improvement*", Great Barrington, MA: North River Press. ISBN 0-88427-061-0
2. James Womack, Daniel Jones, and Daniel Roos, *The Machine That Changed the World*, MacMillan Publishing, New York, NY. 1990
3. Alarcon, L. (1997), *Lean Construction*, Taylor and Francis

Any Other Study Material:

1. PMBOK, IGLC Conference Papers, LCI White Papers

Accounting and Finance for Built Environment

Course Title	:	Accounting and Finance for Built Environment
Course Code	:	AUMREAL660
Credit Units	:	4

L	T	P	SW	FW	Total Credits
2	2	0	0	0	4

Course Objective	:	The aim of this course is to help students of diversified backgrounds to understand the concept, principles, formation and analysis of financial statements and to acquire knowledge of financial management. Objectives of this course are: 1. To prepare the student in understanding and applying accounting and finance concepts. 2. To acquire practical knowledge of understanding and preparation of financial statements 3. To demonstrate competence in interpreting and analyzing financial statements. 4. To acquire knowledge about various financial decisions taken by the firm during business operations.

Pre-requisites	:	• Basic concepts of Mathematics and Statistics • Understanding of Firm's Operations

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	CO1. Appraising principles of accounting and their applicability. CO2. Demonstrating the understanding of various accounting terminologies, concepts, and their application in business. CO3. Developing and inferring financial statements as per accounting regulations. CO4. Analyzing financial statements for Real Estate, Construction, and Infrastructure Industry companies. CO5. Apply the concepts of Time Value of Money in financial and

		investment decisions. CO6. Make decisions about project choice using Capital Budgeting techniques.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I: Introduction to Accounting	**15%**
Basic accounting concepts, Various branches of accounting, users of accounting information, Accounting Principles (GAAP), Concept of IFRS and its convergence with Indian accounting Standards.	
Module II: Journal, ledgers, Trial Balance, Depreciation and stock valuation	**20%**
Journal & ledgers- Concept and Preparation. Trial balance- Concept, Errors (reasons) & Preparation. Concept of depreciation and its types, methods (WDV & SL) and Depreciation accounting, stock valuation- FIFO, LIFO, HIFO methods	
Module III: Final Accounts	**30%**
Concept of Final accounts, Concept of Income statement and Balance sheet, preparation of Final accounts (with and without Adjustments), Financial Statements as per Companies Act 2013, Components of corporate balance sheet, their understand ability and knowledge.	
Module IV: Financial Statements Analysis and Reporting	**15%**
Concept of financial statements, Objectives of financial statement analysis, Tools of analysis (introduction) and Cash Flow Statement preparation (Direct & Indirect Method), Financial ratios and DuPont analysis	
Module V: Financial Management Basics and Capital Budgeting	**20%**
Concept of finance, nature and scope of financial management Time Value of Money – Types of Cash flows, Future Value of a Single Cash Flow, Present Value of a Single Cash Flow; Multiple Flows and Annuity, Growing Annuity- Present Value and Future Value, Perpetuity, and Impact of inflation on financial decision making; Basics of capital budgeting.	

Pedagogy for Course Delivery	:	Theoretical lectures supported relevant examples, followed by tutorials where practical problems will be solved and analyzed. Student assignments/presentations would include group submissions with focus on report/presentation. The companies assigned for the same will be from built environment space so as to get to peculiarities and nuances of accounting practices in such organizations.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	Lab / Practical / Studio (%)
100%	0%

Theory Assessment:

Continuous Assessment / Internal Assessment			End Term Examination
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	45
Field Work	0
Assessment	15
Total Session	**120**

Text & References:

1. Khatri, D.K., 2011. Financial Accounting. Tata Mcgraw Hill.
2. Narayanaswamy, R., 2014. Financial accounting: a managerial perspective. PHI Learning Pvt. Ltd.
3. Asish Bhattacharya, Introduction to financial statement analysis, 1st Edition, Elsevier India
4. Maheshwari, S.N. and Maheshwari, S.K., An Introduction to Accountancy, Vikas Publication
5. Grewal, T.S., Grewal, G.S. and Gerwal, H.S., 2002. Double Entry Book Keeping. Sultan Chand.
6. Goel, D.K., Goel, Shelly., 2018. Financial management. Avichal Publishing company
7. Khan M.Y, Jain P.K, 2018. Financial management. Tata McGraw -Hill Education

Any Other Study Material:

1. Other handouts and related material will be circulated through LMS.

Economics for Built Environment

Course Title	:	Economics of Built Environment
Course Code	:	AUMREAL661
Credit Units	:	4

L	T	P	SW	FW	Total Credits
2	1	0	2	0	4

Course Objective	:	1. To provide students with a basic understanding of economic theory and analytical tools that can be used in decision making problems. 2. The students will also gain a good understanding of economic concepts and tools that have direct managerial applications

Pre-requisites	:	None

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	CO1. To demonstrate an understanding of the economic logic driving business decisions CO2. Interpret and access the key economics parameters behind decisions taken by households and businesses on a day-to-day level CO3. Develop an ability to understand the operation of the Indian and global economy CO4. Learn to compare economic parameters in an international city with the parameters being studied in India. CO5. Interpret macro economy conditions in terms of business requirements CO6. Develop an ability to apply economic concepts in analyzing specific property and regulatory problems in the real estate industry

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Introduction	**10%**
An introduction to basic concepts	
Module II – Key issues in Economics	**25%**
Economic systems for resource allocation Theory of Demand, understanding changes in demand, changing market conditions, elasticity of demand Behavioural Economics Theory of Supply, Supply in the construction industry, Changes in Supply, Elasticity of Supply, Combining supply and demand	
Module 3 – Firms, Markets and Government	**30%**
Clients and Contractors – economic agents in the BE Cost of the construction firm, production, economies of scale, diminishing marginal returns The interplay of Costs, Revenues and Profits, (Additional integrative readings) Markets, Market Mechanisms and Market Structures Market failures and government intervention – what causes market failure, free rider, externalities, information asymmetry, government intervention	
Module 4 – Macroeconomics	**35%**
Macroeconomy, Economy and Construction, Inflation, Expectations and the big picture. Government policy instruments – monetary policy, fiscal policy, direct policy, macroeconomic objectives and policy, macroeconomic management International Economics - introduction The economy and construction, GDP and growth, GDP and construction, leakages and injections, aggregate demand, aggregate supply, increasing capacity in the long run Inflation and expectations, Cost of Living Indices, causes and cures of inflation, credit crunch, quantitative easing, rational expectations Sustainable Construction, role of markets, circle of blame, role of governments,	

Indicative Pedagogy for Course Delivery	:	1. Lectures: To support the development of concepts and methods 2. Problem Solving Exercises: Interactive learning including students on a specific problem and solutions to it 3. Formative Assignments to assist in learning 4. Data analysis using case studies: To expose students to variety of situation and making them understand in comprehensive manner 5. Use of LMS for dissemination of course specific information.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100%	0%

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	15
Self-Work	30
Field Work	0
Assessment	15
Total Hours	**90**

Text & References:

1. Construction Economics – Danny Myers 4th Edition, Routledge
2. The Economics of the Modern Construction Sector – Graham J Ive and Stephen L Gruneberg, 2000, Macmillan Press
3. The Economics for the Modern Built Environment – Leslie Ruddock, 2009, Taylor and Francis
4. Economics - a foundation course for the built environment – J L Manser, 2005, Taylor and Francis Group
5. Urban Economics and Real Estate Markets – Denise DiPasquale, William C Wheaton, 1996, Pearson Education
6. Economic Analysis for Property and Business, Marcus Warren, Routledge, 2011
7. Stiglitz, J.E. and Walsh, C.E. (2006) [SW]. Economics, W.W. Norton and Co.
8. Pyndick and Rubinfield (2008) [PR]. Microeconomics, Wiley India
9. Dornbusch and Fischer (2007) [DF]. Macroeconomics, McGraw Hill India
10. Deepashree, Principles of Micro Economics, Ane Books Pvt Ltd, New Delhi
11. Deepashree, Vanita Agarwal, “Macro Economics”, Ane Books Pvt Ltd, New Delhi
12. DiPasquale, Denise, and William C. Wheaton. Urban economics and real estate markets. Vol. 23. No. 7. Englewood Cliffs, NJ: Prentice Hall, 1996

Any Other Study Material:

1. Lecture handouts, notes, newspaper articles of interest and relevance, important subject specific websites relating to information.
2. Relevant materials to be uploaded on LMS for ease of access.

Project Development and Pre-construction Planning

Course Title	:	Project Development and Pre-construction Planning
Course Code	:	AUMCM662
Credit Unites	:	4

L	**T**	**P**	**SW**	**FW**	**Total Credits**
3	0	0	2	0	4

Course Objective	:	This course aims to provide an overview of components of built environment in general & construction sector in particular and impart basic knowledge, skills, tools and techniques involved in planning for pre-construction phase of a project.

Pre-requisites	:	None

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. To Demonstrate a professional understanding of built environment. CO2. Explain and appraise the project development process. CO3. Demonstrate a professional understanding of project management. CO4. Identify and analyse the deliverables in design management process. CO5. Understand the Built Environment and Construction Ecosystem. CO6. Master Project Development and Management.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - Built Environment and Construction	**20%**

Modules	Weightage (%)
Introduction to built environment - components of built environment - business ecosystem - challenges & opportunities - stakeholder engagement - project lifecycle	
Module II - Project Development	**30%**
Overview of project development process - project need identification - feasibility analysis - project selection - site identification - survey and mapping - geo-technical investigation and analysis - logistics planning - administrative structures and statutory compliances - project procurement methods/project delivery systems	
Module III - Project Management Methodology	**25%**
Overview of project management - project management frameworks such as PMBoK/RIBA/PRINCE2 - project performance - project organisation structure - roles & responsibilities of project managers	
Module IV - Design Management	**25%**
Evolution of design management - design process - design efficiency - identification & engagement of design & planning consultants - roles & responsibilities of stakeholders involved in design phase - design documentation - design information management - application of emerging technologies for design management	

Pedagogy for Course Delivery	:	A managed combination of the lectures, case study discussions and fieldwork shall be used. Course delivery includes theoretical lectures supported by industry-related case studies/assignments. Student projects/assignments would include individual/group submissions with focus on critical thinking involving real construction projects

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	Lab / Practical / Studio (%)
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			End Term Examination
Components	**Project / Home Assignments/ Presentations / Role Play,**	**Attendance**	50%

	etc.		
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	45
Tutorial Contact	0
Self-Work	60
Field Work	0
Assessment	15
Total Hours	**120**

Text & References:

Textbooks

1. Hendrickson, C. (2008). *Project Management for Construction*, Last viewed on 2 July 2018, <pmbook.ce.cmu.edu>
2. Jha, K.N. (2015). *Construction Project Management - Theory and Practice*, 2e, Pearson Education, New Delhi.

Reference Books

1. Cooper, R., Junginger, S. and Lockwood, T. (2011), *The Handbook of Design Management*, Oxford: Berg.
2. *A Guide to the Project Management Body of Knowledge - PMBOK Guide, Sixth Edition*), Published by Project Management Institute, USA, (2017).
3. Grey, C. and Hughes, W. (2001), *Building Design Management*, Taylor and Francis.
4. Neale, R.H. and Neale, D.E. (1989*), Construction Planning*, Thomas Telford.
5. Goodman, Alvin S., Hastak, Makarand, *Infrastructure Planning Handbook: Planning, Engineering and Economics*, ASCE Press.
6. Miles, M.E., Berens, G.L., Eppli, M.J. and Weiss, M.A. (2007) *Real Estate Development Principles and Process, 4th Ed.*, Urban Land Institute Publishers.
7. Heerkens, Gary (2001). *Project Management (The Briefcase Book Series)*. McGraw-Hill. ISBN 0-07- 137952-5. 4.
8. Kerzner, Harold (2003). *Project Management: A Systems Approach to Planning, Scheduling, and Controlling, 8th Ed.*, Wiley. ISBN 0-471-22577-0. 5.

9. Lewis, James (2002). *Fundamentals of Project Management, 2nd ed.*, American Management Association. ISBN 0-8144-7132-3. 6.

10. Meredith, Jack R. and Mantel, Samuel J. (2002). *Project Management: A Managerial Approach, 5th ed.*, Wiley. ISBN 0-471-07323-7.

Construction Methods and Technology

Course Title	:	Construction Methods and Technology
Course Code	:	AUMCM774
Credit Unites	:	4

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	1	0	2	0	4

Course Objective	:	The course aims at understanding the significance and the role that the construction materials, methods, equipment and technology plays in a construction project and develop the ability to critically think and choose right construction material, apply best suited construction method, select appropriate construction equipment for enhanced productivity and technology best suited to the site-specific requirements with specific consideration to ecology and sustainability

Pre-requisites	:	Must have the knowledge of civil engineering and familiarity with National Building Code, IS codes of practices like IS 456, IS 383, IS 800 and other associated National and International Codes of Practices

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Demonstrate professional understanding and knowledge of sustainable construction material, methods and technology CO2. Develop resource based construction method statement and choosing suitable construction technology. CO3. Propose the combination of suitable construction material, methods, technology and equipment. CO4. Interpret construction specifications, with all technical parameters associated with the construction materials, methods and technology. CO5. Students will proficiently select and apply eco-friendly practices for construction. CO6. Graduates will exhibit adept project management skills,

		encompassing site layout, logistics, and method statements for both traditional and modern construction

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - Introduction to the sustainable building materials	**30%**
Introduction to the eco-friendly practices in selecting different building materials and sustainable construction techniques with an understanding of project life cycle. Different types of concrete – steel and other light weight and modern construction materials including glass, engineered wood, polymers and nano materials used for sustainable construction projects.	
Module II - Methods of construction	**25%**
Construction Site Layout and Logistics - consolidation Centre, overview of traditional and modern method of Construction - method statement, construction specifications - different types of modern methods of construction – onsite, offsite, Mechanised.	
Module III - Construction technology	**25%**
Underground Construction – groundwater control – piling and foundations - trenchless technology – rock excavation – drill & blast – tunneling works- tall buildings - concrete pumping – underwater construction. Overview of temporary structures - in construction – formworks & scaffolding – requirements and selection – failure of formworks	
Module IV - Construction equipment	**20%**
Working principle – productivity enhancement - commonly used Construction Equipment for Earthwork, Concrete Construction - Lift & shift – piling - paving tools, plants and machinery, Cost economics of commonly used construction equipment	

Pedagogy for Course Delivery	:	Lectures would present the key conceptual material In order to prepare for lectures, the student must read the readings set for the class, and should prepare short notes on them. The lecturers will bring the important issues to your attention, and add other information that may not be gleaned from the weekly readings. During the course, additional examples may be presented that are relevant to the completion of this course. Lecture slides and/or notes will be uploaded/emailed on LMS. These are not substitutes for the lecture. Many students find it beneficial to take print-outs of the lecture slides and/or notes to the lecture and to annotate them with comments,

		examples, etc. These will generally be available before the lecture. Tutorials would be interactive, collaborative sessions in which students attempt to practice concepts presented at the lecture with their peers. In every tutorial the students are required to discuss the exercises followed by solving the discussion questions, if any. The exercises will be done in a small group of five people and presented to all participants

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	15
Self-Work	60
Field Work	0
Assessment	15
Total Hours	**120**

Text & References:

Textbooks

1. Peurifoy, R., Schexnayder, C.J., Shapira, A. and Schmitt, R. (2010), *Construction Planning, Equipment, and Methods*, 8th ed., McGraw-Hill.

Reference Books

1. Jha, K. N. (2012), *Formwork for Concrete Structures*, Tata McGraw Hill.
2. Bryan, T. (2010), *Construction Technology: Analysis and Choice*, John Wiley and Sons

3. Allen, E. (1985), *Fundamentals of Building Construction: Materials and Methods*, Wiley.
4. Yit Lin Chew, M. (2012), *Construction Technology for Tall Buildings, 4th ed.*, World Scientific.
5. Chudley, R. and Greeno, R. (2006), *Advanced Construction Technology*, Pearson Prentice Hall.

Any Other Study Material:

1. SP 7: 2016 (Volume 1&2) - National Building Code – 2016, IS codes 383, 456, 800, 10262 and IS 15883 (Part 1 t0 12) and other related Indian standard codes of practice.

Business Communications for Built Environment

Course Title	:	Business Communication for Built Environment
Course Code	:	AUMBC606
Credit Units	:	4

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	1	0	2	0	4

Course Objective	:	Communication Skills for Built Environment focuses on a set of core communication skills and supports students in learning these skills. It provides basic understanding regarding the fundamentals and forms of communication and to develop language skills and effective business writing skills. The module is an introduction to professional and business communication, focusing mainly on written and oral communication skills. Students will learn the communication dimensions of workplace as well as the process of planning, composing, and delivering effective communication within the organization and its stake holders.

Pre-requisites	:	Students should have a basic understanding of English language and familiarity with business organization.

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	CO1. Demonstrate knowledge of business environment and business Communication befitting the built environment sector. CO2. Learn and apply concepts of basics of business communication, both oral and written as professionals ready to work in built environment set up. CO3. Develop practical skills in business communication suitable for professional settings within the built environment, enabling effective understanding of Non-verbal communication in workplace scenarios. Appearing for Job Interviews and participating in Group Discussions. CO4. Analyze and draft different types of messages in day-to-day business correspondence and connect with people at with

		effective message writing, drafting Resume as per the Job description. CO5. Attain proficiency in the principles and techniques of report writing, demonstrating the ability to craft comprehensive and effective reports tailored to various situations within the built environment. CO6. Apply strategic thinking and comprehension of business proposal concepts in diverse built environment scenarios, showcasing the capability to create compelling and context-specific business proposals.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - Communications in Organizations	**25%**
Introduction to Business Environment and Communication. Basics of Communication. Corporate Communication. Listening skills, Verbal and Non-verbal communication	
Module II - Written Communication	**25%**
Improving Writing Skills. Planning and Execution of Messages. Writing Different Messages, Writing Reports, Proposals and Business Plans	
Module III - Interpersonal and Cross-Cultural Communication	**25%**
Working and Communicating in Teams. Conversations and Negotiations. Creating and delivering good presentations. Managing Data and Visuals. Business etiquettes. Communicating across cultures.	
Module IV - Career Management and Technology	**25%**
Career Planning and constructing effective resumes. Group Discussions and Interview. Role of technology in Business Communication	

Pedagogy for Course Delivery	:	Pedagogy for course delivery includes theoretical lectures supported by audio-visual aids. Student assignments and exercises would include individual and group submissions with focus on presentations and written communication practice. The prescribed readings in the course pack will provide a good theoretical construct to the subject that needs to be supplemented with reading of journals and web resources. The students are encouraged to access the library for reference books and also read newspaper related to the course.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100%	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	15
Self-Work	60
Field Work	0
Assessment	15
Total Session	**120**

Text & References:

1. Mukherjee, Hory Sankar, 2013; *Business Communication: Connecting at work, 2nd Edition*, Oxford University Press.
2. Ober, Scot, 2009. *Contemporary Business Communication. 5th Edition*. New Delhi: Bizantra.
3. *Business Communication: Building Critical Skills, 3rd Edition* by Kitty O Locker and Stephen Kyo Kaczmarek.

Any Other Study Material:

1. Copy of presentation slides of lectures as uploaded on LMS

SEMESTER - 2

Data Analytics for Built Environment

Course Title	:	Data Analytics for Built Environment
Course Code	:	AUMREAL665
Credit Unites	:	3

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	1	0	0	0	3

Course Objective	:	Develop proficiency in data analysis and management along with managerial decision making, centered on analysis of data.

Pre-requisites	:	Students who haven't undergone any statistics course ever till bachelor's are recommended to undertake basic free online course like - https://in.udacity.com/course/statistics--st095

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	CO1. Demonstrate reasonable understanding and knowledge of statistical concepts. CO2. Demonstrate reasonable ability to read, describe and manage data. CO3. Demonstrate ability to analyse and assess data and draw conclusions. CO4. Develop ability to use statistical software for data analysis. CO5. Recognise and assess significance of big data in the business decisions. CO6. Develop the ability for analysis of data for making predictive models.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Descriptive Statistics	**15%**

Modules	**Weightage (%)**
Introduction to Data Analysis, Data Display & Representation – Tabular and Graphical Methods Measures of Central Tendency, Dispersion and Skewness – Arithmetic and Weighted Mean, Median, Mode, Why Dispersion, Variance and St. Deviation, Relative Dispersion – Coefficient of Variation, Positive, Negative Skewness and measures, Normal Distribution and related assumptions	
Module II – Sampling and Hypothesis testing	**30%**
Introduction, Random sampling, Non-random sampling, Design of Experiments, Sampling Distributions Hypothesis testing One Sample test – Testing of Means when population Standard deviation is known; when population standard deviation is unknown, Testing of proportions, Z tests, T tests, Type I and Type II errors and its impact Two sample independent hypothesis testing and Paired sample hypothesis testing	
Module III – Correlation, Analysis of Variance, Linear and Logistic Regression	**40%**
Correlation analysis; Analysis of variance – Basic Concepts, Variance among sample means, Variance within samples, F ratio, One way and Two way Anova, Tukey HSD Test for Hypothesis testing, Simple Linear Regression, Estimation using regression line, Standard Error of Estimate, Prediction Intervals, Binary Logistic regression, Assumptions associated with ANOVA and Linear Regression, Diagnostics – Linear and Logistic regression.	
Module IV – Predictive Modeling, Big data and Pivot Tables (Excel)	**15%**
Predictive Modeling steps - Multiple Linear regression modeling, Multiple logistic regression modeling, Big data and its application, Creating and manipulating pivot tables, grouping by date and time, grouping by other factors, using slicers to clarify and manipulate fields.	

Pedagogy for Course Delivery	:	Lectures for Statistical theory and concepts. Tutorial in Labs where student will develop skills using open-source Statistical software like R Programming and MS Excel. Students who haven't undergone any statistics course ever till Bachelor's are recommended to undertake basic free online course like https://in.udacity.com/course/statistics--st095

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	Lab / Practical / Studio (%)
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			End Term Examination
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	15
Self-Work	30
Field Work	0
Assessment	15
Total Hours	**90**

Text & References:

1. Levin, Rubin, Rastogi, Siddiqui, Statistics for Management- 8th Edition, Pearson Publication, ISBN: 9789332581180
2. Aczel, Sounderpandian, Saravanan, Complete Business Statistics – 7th Edition, McGraw Hills Publications, ISBN: 9780071077903

Any Other Study Material:

1. Data camp Online Resources
2. https://www.datacamp.com/courses/statistical-modeling-in-r-part-1

3. Udacity Online Resources
4. https://in.udacity.com/course/data-analysis-with-r--ud651

Principles of Asset Valuation

Course Title	:	Principals of Asset Valuation
Course Code	:	AUMREAL668
Credit Units	:	4

L	T	P	SW	FW	Total Credits
2	2	0	0	0	4

Course Objective	:	This course shall give students an overview of basic principles of real estate valuation, its importance, its key terminology and various accepted methods of undertaking real estate valuations. Course would also focus on various purposes of valuation, its nuances, how valuation relates of market, stakeholders in valuation process and key challenges in undertaking real estate valuation. This course would also familiarize students about various professional standards and its importance in valuation profession.

Pre-requisites	:	None

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	CO1. Develop understanding of fundamental concepts related to pricing, value, cost, and essential terminology in the field of asset valuation CO2. Analyze and apply multiple approaches to real estate valuation, including the Market Approach, Cost Approach, and Income Approach, in various real-world scenarios. CO3. Develop understanding and importance of professional standards and ethics in valuation and role of valuer with focus on RICS Valuation Global Standards CO4. Develop skills to use information technology for undertaking valuation. CO5. Examine the implications of economic and market factors on asset valuations and demonstrate the ability to adapt valuation methods to changing market conditions CO6. Critically assess and communicate the results of asset

		valuations, demonstrating the capacity to present valuation reports

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Basics of Valuation	**20%**
Introduction and importance of valuation, understanding value and difference between value, price and cost, purpose of valuation, principles of valuation. Definitions of key terms in real estate valuation. Understanding of bases of value i.e. market value, fair value, investment value and market rest. Exploring other relevant bases of value in local markets. Valuation process and report writing.	
Module II – Market Approach and Cost Approach of Valuation	**25%**
Principles of market approach and cost approach of valuation, valuation process, its application circumstances, data collection, inspection and investigation, adjustment, depreciation and importance of assumptions, nuances involved in undertaking valuation, report writing.	
Module III – Income of approach of valuation and other local market practices	**25%**
Principles of income approach of valuation, valuation process, its application circumstances, data collection, inspection and investigation, discounted cash flow analysis, decision on discounting rate and developer's profit, rent capitalization, depreciation and importance of valuation assumptions, nuances involved in undertaking income approach of valuation, report writing.	
Module IV - Professional Standards and Ethics	**20%**
Importance of professional standards and ethics in valuation profession and for valuer's self-development. Roles and responsibilities of a valuer and member of RICS. What are the different professional standards being following in world including RICS Valuation Global Standards. Current framework of valuation profession in India, role of Insolvency and Bankruptcy Board of India (IBBI) as professional regulator its provisions for real estate valuers.	
Module V - Information Technology in Asset Valuation	**10%**
Current and potential use of information technology in asset valuation, international practice of automated valuation models, use of databases and data analysis software for valuation.	

Pedagogy for Course Delivery	:	1. Student Lecture: To support the development of concepts and methods 2. Problem Solving Exercises: More interactive learning including students on a specific problem and solutions to it 3. Data analysis using case studies: To expose students to variety of situation and making them understand in comprehensive manner 4. Presentations and Group Discusses ions for mutual peer learning. 5. Attending conferences and seminar for industry exposure on subject matter.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100%	0%

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical details, if applicable: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	45
Field Work	0
Assessment	15

Total Session	**120**

Text & References:

1. Scarrett. D. *Property Valuation – The Five Methods*, Routledge, Taylor and Francis, London and New York
2. B. Andrew, M. David, N. Nick, *The Income Approach to Valuation*, Routledge, Taylor and Francis, London and New York
3. Nanavati, R. *Theory and Practice of Valuation*, Lakshmi Book Depot, Mumbai.
4. Rangawala, *S.C. Valuation of Real Properties*, Chatwar Publishing House.
5. RICS Valuation – Global Standards 2017
6. International Valuation Standards - 2017

Any Other Study Material:

1. Class lecture notes/ presentations.
2. Industry report on real estate markets
3. Insolvency and Bankruptcy Code - 2016.
4. Sample valuation repots

Construction Project Planning and Scheduling

Course Title	:	Construction Project Planning and Scheduling
Course Code	:	AUMCM776
Credit Unites	:	4

L	**T**	**P**	**SW**	**IV/FW**	**Total Credits**
2	0	2	0	1	4

Course Objective	:	This course aims to impart basic knowledge, skills, tools and techniques involved in the planning of the execution of construction projects specifically related to scope definition, establishing project integrity, planning towards construction implementation and the creation of project monitoring baselines.

Pre-requisites	:	Knowledge of Project Development and Pre-construction Planning

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Demonstrate a professional understanding of project management processes involved in planning for execution of construction projects. CO2. Develop project scope definition using Work Breakdown Structure. CO3. Create and analyse project schedules. CO4. Estimate and evaluate resource requirements of a project. CO5. Plan for project integration. CO6. Mastery of Project Scope Definition and Management.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - Project Scope Management	**20%**
Importance of project planning - factors influencing the project performance - project management processes in planning for construction execution - construction method statement - project scope management - scope definition - Work Breakdown Structure (WBS) - scope creep - work packaging	
Module II – Project Scheduling	**35%**
Principles of scheduling - activity/task - definition, types & identification - relationships among activities (Industrial visit is required for 1-2 days) - Bar/Gantt/Milestone Charts - network construction using Activity on Node (AON) and Precedence Diagram Method (PDM) - estimation of activity durations - network analysis using Critical Path Method (CPM) and Program (or Project) Evaluation and Review Technique (PERT) - float/slack - location-based scheduling - theory of constraints - critical chain method - types of schedules	
Module III – Resource Planning	**25%**
Construction productivity - productivity measurement & improvement techniques - estimation of resource requirements - resource-oriented/constrained project scheduling - resource allocation techniques - resource levelling - scheduling linear projects using Line of Balance (LOB) method - schedule crashing & compression	
Module IV – Project Integration Management	**20%**
Project integration - plan for cost, quality, contract, procurement, risk and communications management - types of project information - project knowledge - information & knowledge management - Management Information System (MIS) – introduction to modern/advanced project planning and scheduling techniques	

Pedagogy for Course Delivery	:	A managed combination of the lectures, practical, case study discussions and fieldwork shall be used. Course delivery includes theoretical lectures supported by industry-related case studies/assignments. Student projects/assignments would include individual/group submissions with focus on critical thinking involving real construction projects

Lab / Practical details, if applicable:

The lab component will consist of series of experiments/exercises on the use of project planning tools

such as MS Project & Primavera P6 to plan & schedule construction projects. The students will learn to create schedules for construction projects by creating WBS, activity identification, relationships among activities, duration estimation, creation & assignment of resources, refine the schedule to meet the project objectives and prepare baselines for project monitoring.

Industrial visit details:

Students can choose any type of construction site for industrial visit. Students must prepare and submit technical reports after completion of their industrial visit on project schedulling. The report should be on par with the standards of industry reports. The report must include a technical discussion about the project scheduling and must provide evidence for the same.

[**Description of task**: Students need to prepare a schedule for the project. They need to come up with detailed work break down structure from start to finish of the project considering a maximum duration of to complete the project; Students to prepare a work break down structure with activities (preceding, succeeding & independent activities) and to identify the critical path for successful completion of the project; Students should also prepare a schedule for all the identified activities with proper relationship with the activities in Microsoft project software]

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
70	30

Theory Assessment:

	Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Industrial Visit (Module II – Project Scheduling)**	**Attendance**	50%
Weightage (%)	30%	15%	5%	

Lab / Practical / Studio Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Notional Hours:

Lecture Contact	30
Tutorial Contact	0
Practical	30
Self-Work	45
Field Work	0
Assessment	15
Total Hours	**120**

Text & References:

Textbooks

1. Hinze, J. (2012). *Construction Planning and Scheduling*, 4th edition, Pearson Education.
2. Weber, S. C. (2012). *Scheduling Construction Projects - Principles and Practices*, Pearson Education.

Reference Books

1. AGC (1994). *Construction Planning and Scheduling*, Associated General Contractors of America.
2. Callahan, M. T., Quackenbush, D. G. and Rowings, J.E. (1991). *Construction Project Scheduling*, McGraw Hill.
3. Chitkara, K.K. (2012). *Construction Project Management - Planning, Scheduling and Controlling*, 2nd edition, Tata McGraw Hill.
4. Hendrickson, C. (2008). *Project Management for Construction*, Last viewed 28 Nov 2016, <pmbook.ce.cmu.edu>
5. Fewings, P. (2005). *Construction Project Management: An Integrated Approach*, Taylor and Francis.
6. Halpin, D. W. and Woodhead, R. W. (1976). *Design of Construction and Process Operations,* John Wiley and Sons.
7. Harris, P. E. (2016). *Planning & Control Using Ms. Project 2013 & 2016 & PMBOK Guide* Fifth Edition, BPB Publications.
8. Jha, K.N. (2015). *Construction Project Management - Theory and Practice*, second edition, Pearson Education, New Delhi.
9. Patrick, C. (2012). *Construction Project Planning and Scheduling*, Pearson Education.
10. PMI (2017). *Project Management Body of Knowledge (PMBOK)*, 6th edition, Project Management Institute, USA.
11. Schexnayder, C. and Mayo, R.E. (2004). *Construction Management Fundamentals*, McGraw Hill.

Procurement and Tendering

Course Title	:	Procurement and Tendering
Course Code	:	AUMCM769
Credit Unites	:	3

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	1	0	0	0	3

Course Objective	:	This course aims to impart knowledge and practice of procurement management based on various procurement routes and tendering processes for efficient project delivery

Pre-requisites	:	Knowledge of civil engineering, construction processes and materials

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Analyze various procurement methods and strategies to effectively select the most suitable approach for specific project requirements. CO2. Evaluate the legal and ethical considerations involved in procurement and tendering processes, ensuring compliance with relevant regulations and standards. CO3. Demonstrate proficiency in preparing comprehensive tender documents, including specifications, terms, and conditions, to solicit competitive bids from vendors. CO4. Apply negotiation techniques and contract management principles to achieve favorable outcomes in procurement agreements and vendor contracts CO5. Assess risks associated with procurement activities and develop mitigation strategies to safeguard project objectives and budgetary constraints. CO6. Utilize modern procurement tools and technologies to streamline processes, enhance transparency, and optimize

		resource allocation throughout the procurement lifecycle.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Project Procurement Management–An Overview	**30%**
Basic Terms and Definitions; separated, overlapping and integrated procurement routes; Procurement strategy Procurement routes for selection of consultants, suppliers and contractors/sub-contractors of construction projects , Types of consultancy contracts , Types of construction contracts, Make V/s Buy, Make V/s Hire analysis, Monitoring of consultants work and supplier, Procurement Management; Public procurement; PPP procurement and Concession Agreements.	
Module II – Tender Documentation	**40%**
Single and Multi-Staged Tendering; Pre-Qualification criteria; non priced features/criteria; preparation of sound tender documents for r consultancy services, works contracts, and material procurement ; Payment Terms; General Conditions; Special Conditions; Technical specifications; Types of Drawings and design; geo technical data; EMD , Insurance , retention money, DLP, LD, and obligations/duties and requirements of Employer and Contractors; E tendering	
Module III – Bidding Process	**30%**
Sequence of Bidding; NIT, Instructions to Tenderers, RFQ, EOI and RFP, Bid preparation and uploading/issue, pre bid meeting , Bidding strategy, Bid submission ,Bid evaluation, Process of tendering Negotiations, Tender Scheduling for the project, LOI, LOA	

Pedagogy for Course Delivery	:	Theoretical concepts and principles are taught by lectures. The concepts are augmented by tutorials, case study discussion, student presentation, simulation and role plays.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment	**End Term Examination**

Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	15
Self-Work	30
Field Work	0
Assessment	15
Total Hours	**90**

Text & References:

Textbook

1. Jha, K.N., *Construction Project Management*, First Edition, Pearson Publishers, 2011

References

1. Project Management Body of Knowledge (PMBOK), (6th Ed.), Published by Project Management Institute, USA, 2013
2. Benton, W.C. and McHenry, L. F. *Construction Purchasing and Supply Chain Management*, McGraw Hill (2009), ISBN: 978-0-07-154886-1.
3. Pryke, S. (2009), Construction Supply Chain Management – Concepts and Case Studies, Wiley Blackwell, RICS Research.
4. Chase, R., Shankar, R., Jacobs, F.R. and Aquilano, N. (2010), *Operations and Supply Management*, Tata McGraw Hill

Business Development and Marketing Management

Course Title	:	Business Development and Marketing Management
Course Code	:	AUMCM775
Credit Unites	:	3

L	T	P	SW	FW	Total Credits
2	1	0	0	0	3

Course Objective	:	The course aims to impart basic knowledge, skills, tools, and techniques for marketing and business development for organizations involved in the built environment sector.

Pre-requisites	:	None

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	CO1. Demonstrate an understanding of concepts related to organizational behaviour concepts, elucidating how individuals and groups operate within professional contexts. CO2. Demonstrate understanding of human resource management principles, reflecting knowledge in managing organizational personnel effectively. CO3. Relate the principles of organizational behavior used for designing and aligning human resource management functions CO4. Develop an in-depth understanding of human resource management principles, encompassing recruitment, training, performance appraisal, and employee relations for effective organizational personnel management. CO5. Develop an in-depth understanding of human resource management principles, encompassing recruitment, training, performance appraisal, and employee relations for effective organizational personnel management. CO6. Develop the ability to utilize performance metrics and key performance indicators (KPIs) to assess and measure the efficacy

		of various HR functions.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Concepts and Processes in Marketing	**30%**
Introduction to Marketing- Core concepts of Marketing-Functions and importance of Marketing-Marketing Management system: Objectives, its interfaces with other functions in the organization – Marketing Environment-Marketing Process-Marketing Planning- Marketing Implementation and Control.	
Module II – Business Development Strategy	**40%**
Introduction to strategy - Levels of Strategic Management - Analysis, Formulation, Process, and Implementation-Marketing Mix: Traditional 4Ps-Market segmentation & Positioning	
Module III – Buyer Behaviour and CRM	**30%**
Introduction to Consumer & Business buying behavior-stages of buying process-types of buying behavior-factors affecting the buying decision process-Differences between Consumer and Business Buyer Behaviour- Customer Relationship Management-Relationship Marketing Vs Relationship Management-Social action affecting Buyer-Seller Relationships	

Pedagogy for Course Delivery	:	Theoretical concepts shall be imparted during lecture and tutorials. Cases, discussions and assignments shall be used for anchoring of concepts and to elaborate practical application.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play,**	**Attendance**	50%

	etc.		
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	15
Self-Work	30
Field Work	-
Assessment	15
Total Hours	**90**

Text & References:

1. *Principles of Marketing Management, Kotler, Koshy*
2. *Real Estate Marketing by M. Joseph Sirgy published by Routledge*
3. *Marketing – A South Asia Perspective by Phillip Kotler, Kevin Keller, Abraham Koshy and Mithileshwar Jha.*

Any Other Study Material

1. Relevant cases shall be handed over in class

Cost Planning and Management

Course Title	:	Cost Planning and Management
Course Code	:	AUMCM665
Credit Unites	:	4

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	1	2	0	0	4

Course Objective	:	The course aims to impart basic knowledge, skills, tools and techniques involved in planning and execution of projects within the estimated budget. It disseminates application of project management processes involved in project cost management, namely budgeting and cost control with tools and techniques for project cost management.

Pre-requisites	:	Accounting and Finance for the Built Environment, Construction Methods and Technology , Project development and pre-construction planning

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Demonstrate the knowledge of measurement and quantification of different types of construction works CO2. Demonstrate the knowledge of rate analysis of different types of construction works CO3. Analyze pre-tender and post-tender estimates as well as budget for a construction project CO4. Develop a cost plan for effective management of projects CO5. Demonstrate the knowledge of Cash flow analysis CO6. Demonstrate the knowledge of cost control techniques.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - Quantity takeoff & measurement	**20%**
Overview of Cost management process Quantity Takeoff & Measurements Different Construction works Use of Measurement Practices	
Module II –Analysis of Rates	**25%**
Analysis of rates for various construction works that shall include cost of Labour, Materials, Plant & Machineries and Overheads Schedule of rates and Analysis of rates Preparation of Sub contractors rate comparison	
Module III – Estimation & Budgeting	**30%**
Pre & Post Contact Estimation/ Budgeting Types of Estimation BOQ and BID Preparation Preparation of Budget Budget allocation & monitoring Concept of Contingency cost	
Module IV – Cost Planning & Monitoring	**25%**
Cost Planning Preparation of Cost Plan Update & reconciliation of cost plan Reporting of Cost Plan Forecasting as per revised estimate Cash Flow analysis Valuation of construction work Construction Cost control	

Pedagogy for Course Delivery	:	All theoretical concepts will be discussed in the class. Practical case studies will be discussed to enhance the measurement & costing skills. Assignment will be group/individual submission with critical challenging tasks drawn from real construction projects. Practical classes would include the application of software's to construction measurements and cost analysis.

Lab / Practical details, if applicable:

The lab component will consist of series of experiments/exercises on the use of Quantity surveying tools such as CostX to measure and price construction works. The students will learn to measure the construction works and perform rate analysis for the measured construction works.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
75	25

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Notional Hours:

Lecture Contact	30
Tutorial Contact	15

Practical	30
Self-Work	30
Field Work	0
Assessment	15
Total Hours	**120**

Text & References:

Textbooks

1. Jha, K.N., 2015. *Construction Project Management - Theory and Practice, 2nd Ed.*, Pearson Education India.

Reference Books

1. Donald Towey, 2013. *Cost Management of Construction Projects*, Wiley- Blackwell
2. Dutta, B.N. 2018, *Estimating And Costing in Civil Engineering (Theory & Practice), 28th Revised edition*, UBS Publishers, India
3. Project Management Institute, 2017. *A Guide to the Project Management Body of Knowledge (PMBOK Guide) 6th Rev Ed.*, Project Management Institute.
4. *Construction Quantity Surveying: A Practical Guide for the Contractor's QS*, Author: Donald Towey, 2014, ISBN: 978-1-119-02824-6
5. Potts, K. and Ankrah, N., 2014. *Construction Cost Management: Learning from Case Studies, 2nd Ed.*, Taylor and Francis.

Any Other Study Material:

1. Lecture Slides, reading materials, Documents form ISURV, NRM2, POMI, CESMM4, DSR, DAR, and IS1200, RICS Black Book, ICMS, Code of measuring Practice.

Organisational Behaviour and Human Resource Management

Course Title	:	Organizational Behaviour and Human Resources Management
Course Code	:	AUMREAL649
Credit Unites	:	4

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	1	0	2	0	4

Course Objective	:	1. To introduce students to the basic processes of human behaviour and its impact on the workplace in built environment. 2. Acquaint students with various functions, elements, activities and strategies related to Human Resource management for successful business development and growth of the organization.

Pre-requisites	:	None

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	CO1. Demonstrate an understanding of concepts related to organizational behaviour concepts, elucidating how individuals and groups operate within professional contexts. CO2. Demonstrate understanding of human resource management principles, reflecting knowledge in managing organizational personnel effectively. CO3. Relate the principles of organizational behavior used for designing and aligning human resource management functions CO4. Develop an in-depth understanding of human resource management principles, encompassing recruitment, training, performance appraisal, and employee relations for effective organizational personnel management. CO5. Develop an in-depth understanding of human resource management principles, encompassing recruitment, training, performance appraisal, and employee relations for effective

		organizational personnel management. CO6. Develop the ability to utilize performance metrics and key performance indicators (KPIs) to assess and measure the efficacy of various HR functions.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Fundamentals of OB and HRM	**25%**
Understanding OB , HRM and their difference, challenges & opportunities of Human behaviour, Learning(learning process and theories),Perception (Process and theories, JOHARI window, model of self & interpersonal relationships) & Personality-Introduction, Traits of personality, Theories of personality – big five theory, Myer Briggs Type Indicator, Values, Emotions, attitudes and motivations, OB MOD	
Module II – Motivation and Group Dynamics	**25%**
Motivation: Introduction, Process and theories of motivation, Team & Groups [Team work and team building-What is a team, Types of teams, Stages of team development, Characteristic of functional teams], Group Decision making-Group vs individual decision making, Groupthink, Group decision making technique	
Module III – Organization and Leadership	**20%**
Culture, Leadership: What is leadership, Trait theories of leadership, Behavioural theories of leadership, Contingency theories, LMX theory, Charismatic leadership, Transformational leadership, Authentic leadership, Situational leadership, Level 5 leadership, Mentoring as a leadership tool, challenges to the leadership construct	
Module IV – Human Resource Management	**30%**
Human Resource (HR) as core function of organization, Human Resource planning, Recruitment and Selection, Talent management, succession planning , Performance management, learning and development, compensation and benefit, Various statutory compliances in HR	

Pedagogy for Course Delivery	:	Theoretical concepts shall be imparted during lecture and tutorials. Cases, discussions and assignments shall be used for anchoring of concepts and to elaborate practical application.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	15
Self-Work	60
Field Work	0
Assessment	15
Total Hours	**120**

Text & References:

1. *Organizational behavior*; Stephen P Robbins; 15th Edition, Pearson Education
2. DeCenzo, D.A. and Robbins, S.P., 2006. *Fundamentals of human resource management*. Wiley India Pvt Ltd
3. Aswathappa K. ,2013, *Human Resource Management Text and Cases*

Any Other Study Material

4. Relevant cases shall be handed over in class

SEMESTER - 3

Construction Contracts and Dispute Management

Course Title	:	Construction Contracts and Dispute Management
Course Code	:	AUMCM779
Credit Unites	:	3

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	1	0	0	0	3

Course Objective	:	The Course aims at understanding the contract management principles and practices that govern the relationships, duties and obligations of stakeholders and regulate construction processes, including claims and disputes

Pre-requisites	:	Knowledge of construction methods and technology, Cost planning and management, Construction project planning and control, Procurement and Tendering

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to:
		CO1. Comprehensive Understanding of Construction Contracts. CO2. Proficiency in Contract Drafting and Negotiation. CO3. Identification and Analysis of Dispute Causes. CO4. Application of Dispute Resolution Techniques. CO5. Understanding Legal Frameworks and Regulations. CO6. Effective Communication and Stakeholder Management.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - Indian contract act and overview of contract formulation	**20%**
Review of Procurement & Tendering; Award of contract; Key Terms and definitions; Indian Contract Act 1872, Essential Elements of a valid Contract ; Impact of breach of contract; termination and other important clauses; Type of contracts and selection criteria ; standard forms of contract; Model agreement for cost plus contract and lowest price model,	
Module II - Contract practice and management	**35%**
Kick off meeting; Programming, scheduling and monitoring, statutory compliances; Performance Guarantee/Bonds; Advances; Insurances; Best practices Interim Billing; Retention; Extension of Time; changes, variations and claims; Substantial completion; Punch List; Defect Liability period; Retention Money; Final Bill; Best practices- domestic and international as FIDIC, NEC, JCT, ICE; Management of PPP projects and concessionaire agreements	
Module III - Dispute avoidance and resolution	**20%**
Need for Dispute Avoidance; Dispute Avoidance and ADR Methods. Arbitration and Conciliation Act 1996;	
Module IV - Laws and regulation in built environment	**25%**
Building Bye Laws; Real Estate Regulation Authority; Laws and Regulations related to Land acquisition; Labour related Laws; Indirect Taxation;	

Pedagogy for Course Delivery	:	Theoretical concepts and principles are taught by lectures and tutorials. The concepts are augmented by case study discussion and presentation, simulations and role plays. The lecture slides will be uploaded to LMS and students are recommended to read text and reference books to further enhance their knowledge in the subject.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	15
Self-Work	30
Field Work	0
Assessment	15
Total Hours	**90**

Text & References:

Textbooks

1. Harbans Singh, K. S. (2011), *Harbans' Engineering and Construction Contracts Management Law and Principles (2nd Ed.)*, LexisNexis, New Delhi
2. Ramaswamy, B S, (2013), *Contracts and their Management, (4th Ed.)*, LexisNexis, New Delhi.

Reference Books

1. Kohli, Uddesh, Chitkara, KK (2008), *Project Management Handbook, (1st Ed.),* Tata Mcgraw-Hill, New Delhi.
2. *Indian Contract Act 1872. Arbitration and Alternate Dispute Resolution How to settle international business disputes*, Jain Book Depot, 2008, New Delhi.
3. *Arbitration and Conciliation Act (1996)*, As amended in 2015, Jain Book Depot, New Delhi
4. Joshi, P., *Law relating to Infrastructure Projects, 2nd Ed.*, Paperback
5. *Contract Design in Public – Private Partnership and Report prepared for the world bank*, Elisabetta hossa, Gian carlo, spagnolo,and Mercedesvelley, September 2007. Ramanathan B, (2002). *Contract Management, Konark Publishers, New Delhi.*
6. Kumar Neeraj Jha (2017), *Construction Project Management, (2nd Ed.),* Pearson India, Noida
7. CPWD Works Manual 2014 or as amended.

Management of Building Services

Course Title	:	Management of Building Services
Course Code	:	AUMCM773
Credit Unites	:	3

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	1	0	0	0	3

Course Objective	:	This course aims at enabling students to conduct planning and management of building services including plumbing, electrical, HVAC, fire protection, vertical transportation and other essential services.

Pre-requisites	:	Knowledge of • Construction Methods and Technology • Construction Project Planning and Scheduling • Cost Planning and Management

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Demonstrate the different plumbing aspects of building services CO2. Display the knowledge of various fire protection aspects of building services. CO3. Illustrate and analyse HVAC systems CO4. Evaluate vertical and horizontal transportation systems CO5. Describe electrical aspects of building services CO6. Knowledge of co-ordination and management of building services for a project

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Plumbing & Fire Protection	**30%**
Water Supply: Network, fixtures and fittings Liquid Waste: Network, fixtures and fittings Fire Protection: considerations, systems and components Fire Alarm Systems Study of drawings related to plumbing and fire protection services	
Module II – Mechanical Services	**35%**
Fundamentals of thermal comfort Active climate control HVAC components HVAC systems and their typology Vertical and horizontal transportation inside buildings Study of drawings related to mechanical services Recent advancements in mechanical services	
Module III – Electrical Services	**35%**
Standards and procedures: regulations, power company network and coordination Electrical distribution network and equipment Electrical systems and materials Electrical wiring Photovoltaic systems Building security systems	

Pedagogy for Course Delivery	:	Theoretical concepts and principles are taught by lectures and tutorials. The concepts are augmented by case study discussion and presentation, simulations and role plays. The lecture slides will be uploaded to LMS and students are recommended to read text and reference books to further enhance their knowledge in the subject. Students would be suggested to enhance their knowledge through online means as well.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	Lab / Practical / Studio (%)
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			End Term Examination
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	15
Self-Work	30
Field Work	0
Assessment	15
Total Hours	90

Text & References:

Textbooks

1. Stein, Benjamin, John S. Reynolds, Walter T. Grondzik, and Alison G. Kwok. *Mechanical and Electrical Equipment for Buildings*. Wiley (2005).
2. Garg, Santosh Kumar. *Water Supply Engineering: Environmental Engineering Vol. I*. Khanna Publishers (2017).

Reference Books

1. Garg, Santosh Kumar. 2012. *Sewage Disposal and Air Pollution Engineering: Environmental Engineering Vol. II*. New Delhi: Khanna Publishers.
2. Arora, Ramesh Chandra. *Refrigeration and Air Conditioning*. New Delhi, 2010.

3. Haines, Roger W, and Michael E Myers. *HVAC Systems Design Handbook*. New York: McGraw-Hill, 2010.
4. Joshi, Hemant. *Residential, Commercial and Industrial Electrical Systems. Vol. 1-3*. New York, N.Y.: McGraw Hill Education, 2007.
5. Central Public Health and Environmental Engineering Organization. 1999. "*Manual on Water Supply and Treatment*". Ministry of Urban Development, Government of India
6. Central Public Health and Environmental Engineering Organization. 2013. "*Manual on Sewerage and Sewage Treatment*". Ministry of Urban Development, Government of India.
7. Central Public Health and Environmental Engineering Organization. 1998. "*Manual on Municipal Solid Waste Management*". Ministry of Urban Development, Government of India.
8. Indian Plumbing Association, and International Association of Plumbing and Mechanical Officials. 2014. "Uniform Plumbing Code - India."
9. Bureau of Indian Standards. "*SP7: National Building Code of India*." Bureau of Indian Standards.
10. USAID ECO-III Project. "*Energy Conservation Building Code: User Guide*." Bureau of Energy Efficiency, 2009.

Project Monitoring and Control

Course Title	:	Project Monitoring and Control
Course Code	:	AUMCM771
Credit Unites	:	3

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	0	2	0	0	3

Course Objective	:	The course aims to introduce students to project management processes, tools and techniques for monitoring and control of construction projects.

Pre-requisites	:	Knowledge of: • Project Development and Pre-construction Planning • Construction Project Planning and Scheduling

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Demonstrate knowledge and understanding of project performance. CO2. Analyse and evaluate the project performance in terms of scope, schedule, and cost. CO3. Elaborate the sources of changes and its effect on projects. CO4. Articulate the key elements and success criteria of project performance and project management. CO5. Establish and maintain monitoring and control systems for project scope, schedule, and cost. CO6. Demonstrate the ability to identify, assess, and manage changes in a project, considering their impact on time, cost, scope, and risk.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - Project Performance Overview	**30%**
Project performance - project & project management success - factors influencing project performance/success - key performance indicators (KPI) for project performance - need for project monitoring and control - role of planning in monitoring and control - relevance of monitoring and control to various project stakeholders	
Module II – Monitoring and Control Systems	**40%**
Scope, schedule and cost baseline - components of project budget - monitoring/ tracking progress -analysis of progress - comparison of progress with baseline - variance - analysis of reasons for variance - delay analysis - cash flow analysis - control measures - update schedule - integrated system for project analysis - project information management system (PIMS) for monitoring and reporting - earned value management (EVM) - methods of measuring work performed - forecast measures -trend analysis - earned schedule - project definition and rating index (PDRI) – systems for monitoring and control of quality, safety, procurement, risk and communications.	
Module III – Project Change Management	**30%**
Causes of change - effects of change on time, cost, scope & risk - change process – managed and unmanaged changes - integrated change management - contract flexibility - systems for project change management	

Pedagogy for Course Delivery	:	A managed combination of the lectures, practical, case study discussions and fieldwork shall be used. Course delivery includes theoretical lectures supported by industry-related case studies/assignments. Student projects/assignments would include individual/group submissions with focus on critical thinking involving real construction projects

Lab / Practical details, if applicable:

The lab component will consist of series of experiments/exercises on the use of project monitoring & control tools such as but not limited to MS Project, Primavera P6 and Risk Analysis/@Risk to track & control construction projects. The students will learn to create baselines, update schedules based on the progress data and modify schedule to accommodate the changes. Also, they shall be trained on generation of reports based on the progress and forecast.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	Lab / Practical / Studio (%)
60	40

Theory Assessment:

Continuous Assessment / Internal Assessment			End Term Examination
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical details, if applicable:

Continuous Assessment / Internal Assessment			End Term Examination
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Notional Hours:

Lecture Contact	30
Tutorial Contact	0
Practical Contact	30
Self-Work	45
Field Work	0
Assessment	15
Total Hours	**120**

Text & References:

Textbook

1. Jha, K.N. (2015). *Construction Project Management - Theory and Practice*, second edition, Pearson Education, New Delhi.

2. Hendrickson, C. (2008). *Project Management for Construction*, Last viewed 28 Nov 2016, <pmbook.ce.cmu.edu>

References

1. Chitkara, K.K. (2012). *Construction Project Management - Planning, Scheduling and Controlling, 2nd edition*, Tata McGraw Hill.
2. Fewings, P. (2005). *Construction Project Management: An Integrated Approach*, Taylor and Francis.
3. Schexnayder, C. and Mayo, R.E., 2004. *Construction Management Fundamentals*, McGraw-Hill Education
4. *RICS Guidance Notes – Project Monitoring, 1st edition* 2007
5. PMI (2017). *Project Management Body of Knowledge (PMBOK), 6th edition*, Project Management Institute, USA.
6. Harold Kerzner (2011), *Project Management, Metrics, KPIs and Dashboards*, John Wiley & Sons, Limited

Professional Writing for Built Environment

Course Title	:	Professional writing for Built Environment
Course Code	:	AUMBC705
Credit Unites	:	4

L	T	P	SW	FW	Total Credits
2	1	0	2	0	4

Course Objective	:	The course will expose students to various aspects of professional business writing used in the built environment sector. They will learn professional writing including report writing and proposal writing. The course aims to inculcate and communicate professional behavior values grounded in globally accepted conventions. Using RICS professional standards and guidance notes, this course will clearly lay out, the mechanisms to operate within the built environment sphere.

Pre-requisites	:	None

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	CO1. Demonstrate written communication of the highest professional standards, while preparing project documents. CO2. Exhibit commitment to the highest standards of professionalism and documentation proficiency. CO3. Understand the importance of professional written communication expected of RICS members. CO4. Develop skills for formal communication needed for professional business conduct. CO5. Acquire skills vital for effective interaction in corporate settings, ensuring adeptness in professional correspondence and discourse. CO6. Demonstrate ethical written engagement of built environment professionals

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Project Reports	**25%**
Report Writing - Various purpose and stages of reports (inception reports, feasibility report, detailed project report, etc.), preparation of technical and financial proposals.	
Module II – Professional Standards and proposals	**25%**
Understand RICS professional standards and guidance notes; Writing Technical proposals for various purposes - Consultancy projects for competitive bid & Funding for NGO, Writing Technical proposals for various purposes - Research and study projects	
Module III – Business Documentation	**25%**
Preparing minutes of the meeting (MOM), record notes of discussion, note for management approval, investigation report, standard operating procedures, etc.	
Module IV – Consultancy engagement documentation	**20%**
Procurement - aims & principles, type of consultancy contracts, section methodology for consultants, preparation of bid documents (EOI and RFP), terms and conditions for consultant's engagement, a framework for evaluating consultant deliverable and achievements.	

Pedagogy for Course Delivery	:	Lecture Learning by doing / exercises Learning by experience/site visits Learning by expert interactions Learning by secondary documents Class presentations / group discussions Attending seminars/conferences

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100%	0%

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	15
Self-Work	60
Field Work	0
Assessment	15
Total Hours	120

Text & References:

1. RICS Red Book (2014) – Professional Standards
2. Language in Thought and Action - S I Hayakawa
3. Pyramid Principle – Barbara Minto
4. Blair, M. M. (1995). Ownership and control: rethinking corporate governance for the 21st century. Washington: Brookings Institution.
5. Flynn, G. (2008). Leadership and business ethics. U K: Springer.
6. Maclagan, l. P. (1998). Management and morality: A developmental Perspective. New Delhi: Sage.
7. Shiva, R. S. (2001). Corporate crisis management. New Delhi: Response.

Capstone Project - I

Course Title	:	Capstone Project - I
Course Code	:	AUMMSCP601
Credit Unites	:	3

L	T	P	SW	FW	Total Credits
0	0	0	0	0	3

Course Objective	:	The course aims at application of knowledge and understanding in issues related to built environment and develop critical thinking and problem solving capacity.

Pre-requisites	:	Exposure to systematic learnings in built environment

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to:
		CO1. Identify research problem through literature review. CO2. Demonstrate the use of research methodologies. CO3. Develop a clear research proposal. CO4. Conduct ethical research practices. CO5. Critically evaluate research literature. CO6. Communicate research ideas effectively.

Course Content / Syllabus:

Modules	Weightage (%)
Module I	**100%**
Formulating a research problem, objective setting, literature review, establish research methodology and tools, referencing and report writing	

Pedagogy for Course Delivery	:	Various topics related to research methodology, review of literature, research tools and techniques will be delivered in workshop mode. High level of self-study and field work expected for this course.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
0	100

Theory Assessment: NA

Lab / Practical / Studio Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	70%
Weightage (%)	30%	0%	

Notional Hours:

Lecture Contact	0
Tutorial Contact	0
Self-Work	0
Field Work	75
Assessment	15
Total Hours	**90**

Text & References:

Textbooks

1. Kothari, C.R. (2006). *Research Methodology – Methods and Techniques, (2nd Ed.)*. New Delhi: New Age International (P) Ltd.
2. Levin, R. I., and Rubin, D. S. (1999). *Statistics for management (7th Ed.)*. New Delhi: Prentice Hall of India.
3. Ramamurthy, G.C., 2011. *Research methodology*. Kogent Learning Solutions Inc
4. https://socialresearchmethods.net/

Summer Internship

Course Title	:	Summer Internship
Course Code	:	AUMMSS600
Credit Unites	:	3

L	**T**	**P**	**SW**	**FW**	**Total Credits**
0	0	0	0	0	3

Course Objective	:	The course aims to enhance student understanding of the work place and further develop personal and professional skills. Provide experiential learning helping the students to apply theoretical concepts in real life situation

Pre-requisites	:	Knowledge of semester 1&2 courses

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to:
		CO1. Demonstrate a professional understanding of various processes in built environment projects. CO2. Assess the industrial practices to solve real world problems CO3. Improve necessary skills to address issues related to the Built Environment CO4. Develop communication and interpersonal skills. CO5. Demonstrate adaptability and resilience in dynamic work environments. CO6. Foster a commitment to ethical and professional standards.

Pedagogy for Course Delivery	:	The course is designed to give field exposure to the students. Consequently, the course envisages a field training, to be conducted at the work premise of different companies associated with built environment sector. The duration of the course is 8 weeks, during which the students are assigned a company and an industry guide in the respective company. The student is appraised on the defined parameters by the industry. A faculty guide is also allocated to direct the learning of students during this duration. The learning of the student is reviewed during the training by the faculty guide.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
0	100

Theory Assessment: NA

Lab / Practical / Studio Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	70%
Weightage (%)	30%	0%	

Notional Hours:

Lecture Contact	0
Tutorial Contact	0
Self-Work	0
Field Work	320
Assessment	20
Total Hours	**340**

Text & References:

1. Any relevant learning material required to satisfy the learning outcome.
2. Note: In addition to the above the course shall be conducted as per the latest Amity University NTCC Guidelines.

SEMESTER - 4

Building Information Modelling and Management

Course Title	:	Building Information Modelling and Management
Course Code	:	AUMCM770
Credit Unites	:	2

L	**T**	**P**	**SW**	**FW**	**Total Credits**
1	0	2	0	0	2

Course Objective	:	This course aims to impart application of digital construction modelling throughout the lifecycle of a project.

Pre-requisites	:	Project development and pre-construction planning, Project planning and control, Cost planning and management

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Define various aspects of Building Information Modelling (BIM). CO2. Recognize the necessity of management in the processes involving design and digital modelling. CO3. Comprehend the tools, processes and practices needed for virtual design and construction. CO4. Outline and apply implementation and execution plan for utilizing BIM in construction projects. CO5. Understand the Fundamental Concepts of BIM. CO6. Apply BIM in Different Phases of a Project.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - BIM fundamentals	**20%**
BIM Definition & terminology; Difference between 2D CAD, 3D CAD & BIM; People and process aspects of BIM; Global Perspective of BIM; BIM Adoption in India; Drivers & Barriers to the use of BIM in India; Overview of available BIM tools	
Module II - BIM in design and pre-construction phases	**30%**
BIM based Design Process; BIM & Reality Capture; BIM based Design Analysis; BIM based Design Coordination; BIM based Project Documentation; BIM based Quantity Surveying; Inclusion of Construction Classification System information in BIM models.	
Module III – BIM in construction & post-construction phases	**30%**
Introduction to 4D & 5D BIM; Utilization of BIM for Fabrication; BIM based Facility Management;	
Module IV – BIM project execution planning	**20%**
BIM Maturity Levels; BIM & LOD; Interoperability in BIM; BIM Project Execution Plan (BIM XP)	

Pedagogy for Course Delivery	:	Pedagogy for course delivery include lecture presentations, industry related case studies and practical include problems, student presentations and case lets.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
50	50

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Notional Hours:

Lecture Contact	15
Tutorial Contact	0
Practical Contact	30
Self-Work	30
Field Work	0
Assessment	15
Total Hours	90

Text & References:

References

1. C. Eastman, P. Teicholz, R. Sacks & K. Liston, BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors. (John Wiley & Sons, 2008).
2. B. Hardin, & D. McCool, BIM and Construction Management: Proven Tools, Methods, and Workflows. CEUR Workshop Proceedings (Wiley & Sons, Inc., 2015).
3. J. Vandezande, & E. Krygiel, Mastering Autodesk Revit 2018. (Wiley, 2017).
4. Sawhney, A. R. Khanzode, S. Tiwari, Building Information Modelling for Project Managers. (RICS, 2017)

Any Other Study Material:

1. Lecture Slides, reading materials, Documents form Isurv, NRM2, POMI, CESMM4, DSR, DAR, IS1200

Quality, Health and Safety Management

Course Title	:	Quality, Health and Safety Management
Course Code	:	AUMCM780
Credit Unites	:	3

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	1	0	0	0	3

Course Objective	:	This course helps students to understand the underlying concepts pertaining to management of quality, health & safety and their role in effective construction project management

Pre-requisites	:	Knowledge of Built environment

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	On successful completion of the course, students will be able to: CO1. Demonstrate knowledge and understanding of key concepts pertaining to Quality Management CO2. Develop quality checks in construction projects CO3. Demonstrate knowledge and understanding the Fundamentals of Health and Safety, Theories and Principles of Health and Safety Management CO4. Develop health & safety hazard assessment in construction projects CO5. Appraise efficacy of quality, health and safety management plans and policies based on legal and relevant ISO provisions CO6. Assess the impact of quality, health and safety practices on project management performance

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Overview of quality concepts	**30%**

Modules	Weightage (%)
Definition of quality and related concepts. Key Quality Theorists and their contribution. Capturing customer requirements. Product and Process Quality. Linkage between Quality and competitive advantage.	
Module II – Quality management systems	**35%**
Total Quality Management, ISO 9001, Quality Audits, Vendor Management, Quality plans including aspects of quality control and assurance of major construction materials, activities and structures etc. Provisions of PMBOK, Impact of Quality, Health and Safety on various aspects of project management.	
Module III – Health and safety–related theories and regulations	**35%**
Fundamentals of Safety, Introduction to theories of accident, Safety Management Principles-Types of injuries, hazards(including fire hazards), risks and responses pertaining to a construction project. Occupational Health and Hygiene management. Role of safety department, safety officer, safety committee. Safety training, incentives and monitoring, Best Practices in Safety and Health, OHSAS 18001/ ISO 45001, Safety and welfare aspects of factories Act and Building and other construction workers act.	

Pedagogy for Course Delivery	:	Theoretical concepts shall be imparted during lecture and tutorials. Cases, discussions and assignments shall be used for anchoring of concepts and to elaborate practical application.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	Lab / Practical / Studio (%)
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			End Term Examination
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	15
Self-Work	30
Field Work	0
Assessment	15
Total Hours	90

Text books:

1. Watson, P., & Howarth, T. (2012). *Construction quality management: Principles and practice.* Routledge.

Reference Books:

1. Besterfield, Dale H.; Besterfield-Michna, Carol; Besterfield, Glen H; Besterfield-Scare Mary(2010), *Total Quality Management*, Dorling Kindersley (India) Pvt. Ltd.
2. Razzak Rumane, A. (2011), *Quality Management in Construction Projects*, CRC Press.
3. Hinze, J.W. (1996), Construction Safety, Prentice Hall.
4. Holt, Allan St. John, 2005, *Principles of Construction Safety*, Blackwell Publishing

Any Other Study Material:

1. ISO 9001, ISO 18001, *PMBOK, Factories Act, Building and Other Construction Worker's Act*

Risk Management in Construction Projects

Course Title	:	Risk Management in Construction Projects
Course Code	:	AUMCM791
Credit Units	:	2

L	**T**	**P**	**SW**	**FW**	**Total Credits**
1	1	0	0	0	2

Course Objective	:	The course aims to disseminate the knowledge and practice of risk management in construction projects

Pre-requisites	:	Knowledge of civil engineering basics vis-a-vis construction processes and materials and relevant services to be availed for the same

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of this course, the students will be able to: CO1. Identify and assess risks: Recognize and evaluate various risks in construction projects. CO2. Develop mitigation strategies: Formulate effective plans to minimize the impact of identified risks. CO3. Implement risk management techniques: Utilize tools like risk registers and simulations to analyze and manage risks systematically. CO4. Evaluate risk impacts: Assess potential effects on project scope, schedule, cost, quality, and safety. CO5. Communicate risk information: Effectively convey risk assessments to stakeholders through clear reports and presentations. CO6. Continuous improvement: Learn from past projects to refine risk management processes for future endeavors.

Course Content / Syllabus:

Syllabus	**Weightage (%)**
Module I - Overview of construction project risk management	**35%**
Introduction to Project Risk Management. Risk definition. Strategy of Risk management. Identification of risk. Approach and Sources of Risk/Events and Classification of Risks. Project risk to contractors, risk during tender preparation, completion and technical failures, selection of contractors, sub-contractors and vendors. Risk Register. And Risk Management Plan. Role of QS in Risk Management.	
Module II - Risk assessment and approaches	**30%**
Risk Assessment-Approaches: Qualitative and Quantitative, sensitivity analysis of various identified risk. Quantification of Uncertainty in Time estimation/project duration and Cost Estimation. Contingency allowances.	
Module III - Risk mitigation and control	**35%**
Risk Mitigation strategy. Apportionment and Allocation of Risks. Development of Risk Response Plan. Project Risk Control methodology. Project Manager and Risk Management. Benefits of Managing Project Risks.	

Pedagogy for Course Delivery	:	Theoretical concepts and principles are taught by lectures and tutorials. The understanding of concepts is augmented by case study discussion and presentation, simulation and role plays.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	15
Tutorial Contact	15
Self-Work	15
Field Work	0
Assessment	15
Total Hours	**60**

Text & References:

Text Books:

1. Jha, K.N. (2015). *Construction Project Management - Theory and Practice*, second edition, Pearson Education, New Delhi.

Reference Books:

1. Flanagan R. and Norman G. (1993), *Risk Management and Construction*, Blackwell Science, London.
2. Kohli Udesh, Chitkara KK. (2008), *Project Management Handbook,* Tata McGraw-Hill Publishing Company Limited, New Delhi.
3. *Project Management Body of Knowledge (PMBOK),* (5th Ed.), Published by Project Management Institute, USA, 2013
4. Burtonshaw-gunn, S.A. (2010), *Risk and Financial Management in Construction*, Gower Publishing Ltd, 2010
5. Dash, W.D. (2011), *Modelling Risk Management in Sustainable Construction,* Springer
6. Edwards, L. (1995), *Practical Risk Management in the Construction Industry,* Thomas TelfordKendrick, Tom, (2013), *Identifying and Managing Project Risk*, PHI Learning Private Limited, Delhi

Professional Practice and Ethics

Course Title	:	Professional Practice and Ethics
Course Code	:	AUMBS705
Credit Units	:	4

L	T	P	SW	FW	Total Credits
2	1	0	2	0	4

Course Objective	:	The course will expose students to various real-world ethical conflicts that they are likely to encounter and respond in a manner that is founded on ethics and professional practice. The course aims to inculcate ethical values using case studies. Applying fundamentals of behavioral science, students will learn issues relating to business ethics, professional ethics, morals and values. The course would also further explore the concept of leadership (focusing on Ethical leadership) and its impact on the ethical climate in the organization. Importance of mentorship in furthering the ethical climate shall be discussed.

Pre-requisites	:	None

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of this course, the students will be able to: CO1. Differentiate between ethical and unethical practices CO2. Understand the importance of ethics to professional development. CO3. Understand role of mentoring in enhancing the ethical culture. CO4. Understand the importance of ethics to personal development. CO5. Know the five ethical standards that RICS members observe and its regulatory framework. CO6. Develop personal ethical traits that need to be adopted for

		consistent professional practice.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - Ethics in Financial Market	
Ethics in financial markets and investor protection, Marketing Ethics (products, pricing, promotion and place), Ethical responsibility towards competitor and business partners.	**25%**
Module II - Code of professional practice and ethics	
Code of professional practice and ethics, Business Ethics - Introduction to business ethics, Ethics, morals and values, theory of rights, justice, business standards, Ethical issues at top management, RICS ethics model-RICS Global Professional and Ethical Standards, RICS Decision Tree, Code of Ethics and Standards of Practice for developers and realtors in India- Real Estate (Regulation and Development) Act	**25%**
Module III - Corporate governance and social responsibilities	
Corporate governance and social responsibilities of an Organization towards different stakeholders. Complexity of Ethical Issues - Conflicts in decision making from ethical and economic point of view.	**25%**
Module IV – Leadership, Traits, values and ethical behavior	
What is leadership, Trait theories of leadership, Behavioural theories of leadership, Contingency theories, LMX theory, Charismatic leadership, Transformational leadership, Authentic leadership Situational leadership, Level 5 leadership, Mentoring as a leadership tool, challenges to the leadership construct, Traits, values and ethical behavior. Mentoring and its impact on ethical climate. Leadership and its span on influence regarding the ethical climate. Charismatic, Transformational and Bureaucratic leadership styles and the impact of their dark sides on ethics, Toxic leadership. Use of power bases and their consequent impact on ethical climate. Concept of Ethical leadership. Concept of collective leadership and the role of a board on up-holing the ethical climate.	**25%**

Pedagogy for Course Delivery	:	Lecture with case studies

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	Lab / Practical / Studio (%)
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			End Term Examination
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	15
Self-Work	60
Field Work	0
Assessment	15
Total Hours	**120**

Text & References:

1. AIMA. (2007). Corporate governance & business ethics. New Delhi: Excel.
2. The right thing: an everyday guide to ethics work in business - Bibb, Sally 2010
3. Carrol, S. J., & Gannon, J. J. (1997). Ethical dimensions of international management. New Delhi: Sage.
4. Chakraborty, S. K. (2001). The Management and ethics omnibus. New Delhi: Oxford University Press.
5. Flynn, G. (2008). Leadership and business ethics. U K: Springer.
6. Holden, l. P. (2000). Ethics for managers. Hampshire: Gower.
7. Johnson, C. E. (2008). Meeting the ethical challenges of leadership: casting light or shadow (3rd ed.). New Delhi: Sage.

8. Maclagan, l. P. (1998). Management and morality: A developmental Perspective. New Delhi: Sage.
9. Malachowski, A. (2001). Business ethics: Critical perspective on business and management. London: Routledge.
10. Robert, A. (2009). Business ethics and ethical business. USA: Oxford University Press.
11. Sekhar, R. C. (2002). Ethical choices in business (2nd ed.). New Delhi: Response.
12. Shiva, R. S. (2001). Corporate crisis management. New Delhi: Response.
13. Valasquez, M. G. (2006). Business ethics: Concepts and cases (6th ed.).USA: Prentice Hall.
14. Organizational behaviour; Stephen P Robbins; 15th Edition, Pearson Education.
15. Leadership in Organizations (8th Edition); by Gary Yukl
16. Real Estate (Regulation & Development) Acts of various state governments such as Maharashtra, Uttar Pradesh, Haryana and Karnataka etc.
17. Code of Ethics and Standards of Practice of the National Association of Realtors® and/ or similar organizations

Capstone Project – II

Course Title	:	Capstone Project – II
Course Code	:	AUMMSCP602
Credit Unites	:	6

L	**T**	**P**	**SW**	**FW**	**Total Credits**
0	0	0	0	0	6

Course Objective	*:*	The objective of this course is to enable the student to develop application/analytical skills, critical thinking, apply and analyze issues related to built environment using appropriate research techniques and methodology

Pre-requisites	:	Knowledge of Research Tools & Methodology.

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Stimulate their minds to think coherently by identifying relevant variables, describing their basic characteristics, and specifying how the variables relates to each other. CO2. Select, evaluate and apply critical management thinking to an industry/sectoral issue or problem. CO3. Critically evaluate the techniques and processes used to investigate an important organizational issue or problem. CO4. Combine the learning across specialization and do research in the built environment. CO5. Develop and implement effective project management strategies and methodologies tailored to real-world construction and quantity surveying challenges. CO6. Demonstrate the ability to communicate complex research findings clearly and professionally through written reports, presentations, and viva voce, showcasing a comprehensive understanding of the studied topics.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I	**100%**
Continuation of capstone project - 1 study, to conduct the following: Data collection as per the methodology finalized Data Analysis Summarize findings Present conclusion and recommendation. Prepare a professional report	

Pedagogy for Course Delivery	:	Various topics related to research methodology, synthesizing of literature, research tools and techniques will be taught in workshop mode. High level of self-study and field work shall form the focus of this course.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
0	100

Theory Assessment: NA

Lab / Practical / Studio Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	60%
Weightage (%)	40%	5%	

Notional Hours:

Lecture Contact	0
Tutorial Contact	0
Self-Work	0

Field Work	180
Assessment	20
Total Session	**200**

Text & Reference Books:

1. Kothari, C.R. (2006). *Research Methodology – Methods and Techniques*, (2nd Ed.). New Delhi: New Age International (P) Ltd.
2. Levin, R. I., and Rubin, D. S. (1999). *Statistics for management* (7th Ed.). New Delhi: Prentice Hall of India.
3. Ramamurthy, G.C., 2011. *Research methodology*. Kogent Learning Solutions Inc,
4. https://socialresearchmethods.net/

DOMAIN ELECTIVES

Lean Construction Practices

Course Title	:	Lean Construction Practices
Course Code	:	AUMCM785
Credit Unites	:	5

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	2	0	2	0	5

Course Objective	:	The course focuses on application of various concepts and principles of lean, tools and techniques for efficient project delivery.

Pre-requisites	:	Knowledge of project planning and procurement

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Demonstrate the understanding of lean construction practices CO2. Illustrate the relevance of Lean concepts to the construction industry CO3. Apply various lean construction techniques during the project design phases CO4. Identify the issues in the process and recommend resolutions CO5. Implement lean techniques during the project construction phases CO6. Evaluate lean implementation strategies at organization level

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - Introduction to Lean Concepts	**15%**

Introduction to lean philosophy, Defining Lean Construction, Toyota way, overview and history of lean principles, Lean Culture	
Module II - Lean Process Management	**20%**
Lean Project Delivery System, Lean Design Management, Lean Supply, Lean Assembly, linkages of lean and green concepts in design of the built environment, Lean and Offsite construction, Lean Procurement	
Module III - Lean Tools and Techniques	**40%**
Value-Driven Delivery, Continuous improvement, Pull Systems, Team Performance, Problem Detection and Resolution, Integrated project Delivery, Relational Contracting, Partnering, Lean Construction Assessment Framework	
Module IV - Lean Construction Applications	**25%**
Lean Leadership, Qualities of a Lean Coach, Lean Implementation and IPD case studies, IGLC case studies, Drivers and Barriers to lean implementation	

Pedagogy for Course Delivery	:	Theoretical concepts shall be imparted during lecture and tutorials. Cases, discussions and assignments shall be used for anchoring of concepts and to elaborate practical application.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

Textbooks

1. *Modern Construction: Lean Project Delivery and Integrated Practices*, Lincoln H. Forbes and Syed M. Ahmed (2010), CRC Press.

Reference Books

1. Goldratt, Eliyahu M. and Jeff Cox (1992), "*The Goal: A Process of Ongoing Improvement*", Great Barrington, MA: North River Press. ISBN 0-88427-061-0
2. James Womack, Daniel Jones, and Daniel Roos, *The Machine That Changed the World*, MacMillan Publishing, New York, NY. 1990
3. Alarcon, L. (1997), *Lean Construction*, Taylor and Francis

Any Other Study Material:

1. PMBOK, Factories Act, IGLC Conference Papers, LCI White Papers

Claims and Change Management

Course Title	:	Claims and Change Management
Course Code	:	AUMCM786
Credit Unites	:	5

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	2	0	2	0	5

Course Objective	:	The Objective of this Course is to impart knowledge, understanding and application of Change & Claim Management of construction Projects for a successful project delivery.

Pre-requisites	:	The students are expected to have knowledge in the following: • Principles of Management • Procurement and tendering • Contract Practice and Dispute avoidance/resolution

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Analyze the principles and practices of claims management within various industries, including construction, insurance, and legal sectors. CO2. Evaluate the impact of change management strategies on project outcomes, including cost, schedule, and stakeholder satisfaction. CO3. Apply effective techniques for identifying, documenting, and mitigating project risks associated with claims and changes. CO4. Demonstrate proficiency in assessing the validity of claims and implementing appropriate dispute resolution mechanisms. CO5. Develop strategies for communicating and negotiating with stakeholders involved in claims and change processes. CO6. Synthesize ethical considerations and legal requirements in

		managing claims and implementing changes within project environments

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - Change Management-An Overview	**25%**
Introduction to change management; Types of Changes and origins; measurement of change from baseline; Management of change process-during various stages/steps.	
Module II - Change Management Process	**30%**
Framework of change dependency; Contractual issues and change procedures-Contractor's and Employer's perspectives; Relationship between Change, Conflict-Claim and Dispute; International Best Practices. Pre requisites to admissibility of claims, Effect and Management of Change;	
Module III - Claim Management	**45%**
Main Causes of Claims; delay analysis , Extension of Time (EOT) Claims; contractual implications of non-approval of EOT & recovery of damages; claims for variations; claims due to price fluctuations, exchange rates, subsequent legislation etc.; acceleration claims; late payments/finance charges; formal submission & substantiation of claims; Counter claims.	

Pedagogy for Course Delivery	:	Theoretical concepts and principles are taught by lectures and tutorials. The concepts are augmented by case study discussion and presentation, simulations and role plays. The lecture slides will be uploaded to LMS and students are recommended to read text and reference books to further enhance their knowledge in the subject. Students would be suggested to enhance their knowledge through online means as well.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

Textbooks

1. Hewitt, Andy (2011), *Construction Claims & Responses: effective writing & presentation*, First Edition. John Wiley & Sons
2. Ramaswamy, B S (2013), *Contracts and Management, (4th Ed.)*, LexisNexis, New Delhi.
3. Patil, BS, (2013), *Civil Engineering Contracts and Estimates (3rd Ed.)* University Press, Hyderabad.
4. Uher, T.E. and Devenport, P. (2010), *Fundamentals of Building Contract Management (2nd Ed.)*, UNSW Press
5. Thomas, Reg, (2001), *Construction Contract Claims*, Palgrave.

Dispute and Conflict Avoidance in Construction management

Course Title	:	Dispute and Conflict Avoidance in Construction management
Course Code	:	AUMCM787
Credit Unites	:	5

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	2	0	2	0	5

Course Objective	:	The objective of this course is to enable students to be involved in the process of Conflict avoidance, management and Dispute resolution in construction projects.

Pre-requisites	:	Knowledge of contract management along with knowledge of construction processes and materials

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Identification of Potential Conflict Triggers. CO2. Application of Conflict Avoidance Strategies. CO3. Understanding of Stakeholder Dynamics. CO4. Risk Assessment and Management. CO5. Legal and Regulatory Compliance. CO6. Implementation of Conflict Resolution Mechanisms.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Overview of Conflicts and Disputes in Construction	**20%**
Review of conflict and dispute management; procurement; General Techniques of Conflict Avoidance and management. Importance of prevention/timely action; essentials of Contract administration; Types of	

Contracts and disputes	
Module II - Dispute and conflict avoidance	**20%**
Indicators to minimize or avoid disputes including Importance of proper drafting of Contracts. ; Good Record keeping, and adherence to Contract conditions, statutory compliances, Forms of contract for dispute avoidance. Scrutiny of contract document; Preventive action and protocol for construction and Engineering Disputes.	
Module III- Dispute Avoidance - Best Practices and Responsibilities	**30%**
Roles and Responsibilities of various stake holders in Dispute avoidance & prevention; Importance of timely land acquisition/environmental clearances/impact assessments by Client; early determination and issue of Drawings/designs/specifications by the Engineer/Designer; Multi party, multistate and multi-contract issues; early involvement of contractor in building procurement;	
Module IV- Dispute Resolution	**30%**
Roles and responsibilities of various stake holders in Dispute Resolutions; Arbitration vs Litigation; process of Dispute Resolution. DRB/DAB; Amicable settlement; Arbitration. International Commercial Arbitration Advanced forms of contracts, FIDIC contracts, and other forms of contract, performance-based contracting, collaborative contracting, relational contracting, partnering, presentation Disputes resolution mechanism. UNCITRAL Model Law on International Arbitration 1985 and Conciliation 2002 and rules thereof.	

Pedagogy for Course Delivery	:	Theoretical concepts and principles are taught by lectures and tutorials. The concepts are augmented by case study discussion and presentation, simulations and role plays. The lecture slides will be uploaded to LMS and students are recommended to read text and reference books to further enhance their knowledge in the subject. Students would be suggested to enhance their knowledge through online means as well.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

Textbooks

1. *Arbitration and Alternate Dispute Resolution How to settle international business disputes*, Jain Book Depot, 2008
2. Campbell P (1997), *Construction Disputes-Avoidance & Resolution*; Whittles Publishing; ISBN: 978-1870325073

Reference Books

1. Harbans Singh, K. S. (2011), *Harbans' Engineering and Construction Contracts Management Law and Principles (2nd Ed.)*, LexisNexis
2. Ramaswamy, B S, (2013), *Contracts and Management, (4th Ed.)*, LexisNexis, New Delhi.
3. Patil, BS, (2013), *Civil Engineering Contracts and Estimates (3rd Ed.)* University Press, Hyderabad.
4. Uher, T.E. and Devenport, P. (2010). *Fundamentals of Building Contract Management (2nd Ed.)*, UNSW Press.
5. Murdoch, J.R. and Hughes, W. (2007), *Construction Contracts: Law and Management*, Taylor and Francis.
6. Chawla, S.K. (2012), *Law of Arbitration and Conciliation Including Other ADRs*, Jain Book Depot.
7. *Indian Contract Act 1872*.
8. *Arbitartion & Conciliation Act 1996 (Amendment 2015)*.

International Practices in Measurements and Contracts

Course Title	:	International Practices in Measurement and Contracts
Course Code	:	AUMCM788
Credit Unites	:	5

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	2	0	2	0	5

Course Objective	:	The objective of this course is to enable students to be aware of the global practices in Construction Measurements and Contracts.

Pre-requisites	:	Knowledge of civil engineering basics vis-a-vis construction processes and materials

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Explain the principles and framework of the New Rules of Measurement (NRM) and their relevance to construction projects. CO2. Demonstrate the ability to apply the New Rules of Measurement in preparing and interpreting cost-related project documents. CO3**.** Analyze and appraise construction project cost information for accurate cost planning and control. CO4. Prepare and present Bills of Quantities (BOQ) in line with international codes and recognized measurement standards. CO5**.** Identify and compare global standard forms of contracts, with particular emphasis on their relationship to measurement standards and methodologies. CO6**.** Apply international measurement codes and practices in evaluating, verifying, and auditing construction project documentation.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - International perspective of Quantity surveying	**20%**
Definitions; International professional quantity surveying institutions; Role of Quantity Surveying Profession; Attributes required to be a successful quantity surveyor	
Module II – International Measurement Standards	**45%**
Discussions on international standards such as but not limited to ICMS, POMI, NRM, CESMM etc. Preparation of BOQs as per International Measurement standards.	
Module III - International Contracts	**35%**
Detailed study of various International Standard Forms of Contracts; International Arbitration and ADR Methods; interpretation of clauses affecting payment/valuation systems, measurements, variations and claims	

Pedagogy for Course Delivery	:	Theoretical concepts and principles are taught by lectures and tutorials. The concepts are augmented by case study discussion and presentation, simulations and role plays. The lecture slides will be uploaded to LMS and students are recommended to read text and reference books to further enhance their knowledge in the subject. Students would be suggested to enhance their through online means.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

Textbooks

1. Ostrowski, S.D.C (2013), *Measurement: Using New Rules of Measurement*, Wiley-Blackell.
2. RICS New Rules of Measurement, SMM7, CESMM4
3. Harbans Singh, K. S. (2011), *Harbans' Engineering and Construction Contracts Management Law and Principles (2nd Ed.)*, LexisNexis
4. Uher, T.E. and Devenport, P. (2010), *Fundamentals of Building Contract Management (2nd Ed.)*, UNSW Press
5. Murdoch, J.R. and Hughes, W. (2007), *Construction Contracts: Law and Management*, Taylor and Francis
6. Chawla, S.K. (2012), *Law of Arbitration and Conciliation Including Other ADRs*, Jain Book Depot.
7. *Arbitration and Alternate Dispute Resolution How to settle international business disputes*, Jain Book Depot, 2008.
8. RICS Black Book

International Construction Project Finance

Course Title	:	International Construction Project Finance
Course Code	:	AUMCM784
Credit Unites	:	5

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	2	0	2	0	5

Course Objective	:	The subject aims at aspects of construction project financial management for projects and with an attention to capital investment decisions and cash flow management.

Pre-requisites	:	Knowledge of project management and economics for built environment

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Prepare a developer's budget in alignment with project requirements and financial planning principles. CO2. Revise and modify a developer's budget to reflect changes in project scope, costs, and market conditions. CO3. Identify and explain key factors influencing bid preparation, including market conditions, risk assessment, and competition. CO4. Evaluate and apply strategies for bid preparation to ensure competitiveness and financial viability. CO5. Interpret and analyze project cash flow schedules and financial statements to support effective cost control and decision-making. CO6. Examine and discuss the financial, managerial, and operational factors leading to insolvency in the construction industry.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - Introduction to construction economics	**30%**
Engineering economics: Basic principles – Time value of money, Quantifying alternatives for decision making, Cash flow diagrams, Equivalence- Single payment in the future (P/F, F/P), Present payment compared to uniform series payments (P/A,A/P), Future payment compared to uniform series payments (F/A,A/F),Arithmetic gradient, Geometric gradient.	
Module II –Investment	**25%**
Capital investment: The nature of capital. Fixed capital and working capital. Sources and costs of capital for construction projects. Investment appraisal: The developers' budget. Comparison of alternatives: Present, future and annual worth method of comparing alternatives, Rate of return, Incremental rate of return, Break-even comparisons, Capitalized cost analysis, Benefit-cost analysis.	
Module III – Project costs and bidding Process	**30%**
Construction costs: Site costs and overhead costs. Allocation of costs within and between contracts. Sources and reliability of cost data for use in managing construction costs. Accounts and ratios. Cost control of construction projects. Bidding strategy: Preparing a bid for contract work including allocation of overheads. Pricing strategies for speculative work.	
Module IV – Financial management: Construction accounting	**15%**
Cash flow management: Single project and multi-project cash flow. Management of cash flow for the client and the contractor. Insolvency in construction: The incidence of insolvency in the construction sector. Factors that cause insolvency., Chart of Accounts, Financial statements – Profit and loss, Balance sheets, Financial ratios, Working capital management	

Pedagogy for Course Delivery	:	Theoretical concepts and principles are taught by lectures and tutorials. The concepts are augmented by case study discussion and presentation, simulations and role plays. The lecture slides will be uploaded to LMS and students are recommended to read text and reference books to further enhance their knowledge in the subject. Students would be suggested to enhance their knowledge through online means as well.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	Lab / Practical / Studio (%)
100	-

Theory Assessment:

Continuous Assessment / Internal Assessment			End Term Examination
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

Textbooks

1. Ostwald, P.F., "*Construction Cost Analysis and Estimating*", Prentice Hall, Upper Saddle River, New Jersey, 2001.
2. Bose, D.C., "*Fundamentals of Financial management*", 2nd ed., PHI, New Delhi, 2010.

Reference Books

1. *Interfacing Risk and Earned Value Management: 1 (2008) Association for Project Management; (First Edition)* ISBN: 978-1903494240
2. *Practice Standard for Earned Value Management (2005) Project Management Institute*. ISBN: 978-1930699427
3. Kirkham. *Richard: Ferry and Brandon's Cost Planning of Buildings*, Blackwell Science, Oxford.
4. Harris F, McCaffer R and Edun-Fotwe, *Francis, Modern Construction Management*; Blackwell, 2006
5. Potts, Keith, *Construction Cost Management: Learning From Case Studies (2008)*, Span.

Health and Safety Management in Construction

Course Title	:	Health and Safety Management in Construction
Course Code	:	AUMCM790
Credit Unites	:	5

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	2	0	2	0	5

Course Objective	:	To understand the underlying concepts pertaining to occupational health and safety management and their role in effective construction project management

Pre-requisites	:	Knowledge of risk management, Health and safety

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Demonstrate knowledge and understanding the Fundamentals of Health and Safety, Theories and Principles of Health and Safety Management CO2. Illustrate knowledge and understanding of legal and codal provisions pertaining to occupational health and safety management, ISO and OSHAS requirements. CO3. Apply the concepts of risk management to health and safety issues to assess the efficacy of health and safety management plans CO4. Develop health & safety management plan for construction project CO5. Appraise efficacy of health and safety training and implementation to safe project execution. CO6. Demonstrate knowledge of fire and disaster management and develop disaster management plans for construction projects

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Planning For Health and Safety	**30%**
Accidents and their causes (Focus on behavior based safety); Construction and occupational Hazards; Management of Risk for health and safety; SHE Policy; Requirement of OHSAS 18001/ISO 45001; Personal Protective Equipment (PPE); HAZOP; Hazard Identification; Assessing Risk; Common construction Hazards and their control.	
Module II – Legal aspects and Management of Health and Safety	**30%**
Health and safety norms and codes for construction works; Role of Safety Department; Responsibility of the employers; Ergonomics; Industrial psychology and wellness at workplace; best practices in managing health and safety at construction sites.	
Module III – Management Procedures	**20%**
Health and Safety Audits; Accident investigation; Reporting accidents; accident statistics and analysis; training and culture for safety; Health and Safety plan; Trainings; Meetings.	
Module IV – Fire Safety, Disaster and Emergency Management	**20%**
Causes and prevention of fires; Fire prevention, Fire Risk Assessment; Environmental impact of fire; National Disaster Management Guidelines; Disaster Management Plans	

Pedagogy for Course Delivery	:	Theoretical concepts shall be imparted during lecture and tutorials. Cases, discussions and assignments shall be used for anchoring of concepts and to elaborate practical application.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment	**End Term Examination**

Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

Textbooks

1. Allan St John Holt (2006). *Principles of Construction Safety*. UK: Blackwell Publishers.
2. Andrew Furness and Martin Muckett (2007). *Introduction to Fire Safety Management*. UK: Butterworth Heinemann.

Any Other Study Material:

1. ISO 18001, Factories Act, Building and Other Construction Worker's Act, NDMA Guidelines.

Operations Research for Built Environment

Course Title	:	Operations Research for Built Environment
Course Code	:	AUMCM781
Credit Unites	:	5

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	2	0	2	0	5

Course Objective	:	This course aims to develop quantitative skills for decision making process in construction industry and familiarize with medium and short-range planning & control functions of production. The course shall be focused on equipping the students with advanced operations research tools, development of basic model formulations, solution techniques, and illustration of the concepts for decision making.

Pre-requisites	:	None

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Develop medium- and short-range planning and control functions to support effective production management. CO2. Apply structured decision-making processes using quantitative methods to address project and operational challenges. CO3. Demonstrate the application of operations research techniques for analyzing real-world, field-based problems. CO4. Evaluate alternative solutions using operations research tools to recommend the most appropriate decisions. CO5. Formulate linear programming models for construction and project management scenarios. CO6. Solve linear programming problems and apply multi-criteria

		decision-making techniques, including the Analytic Hierarchy Process (AHP), to optimize objectives.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - Resource Planning	**30%**
Aggregate Planning: Variables, Aggregate Planning Strategies, Aggregate Planning, Mathematical Optimization methods for Aggregate Planning. Materials Resource Planning (MRP): Define MRP, MRP logic and Product structure tree, Master Production Schedule, MRP System, Reports, MRP Examples Capacity Planning: Strategic Capacity Planning, Capacity Utilization, Cost Volume Relationships, Break even analysis, Capacity Planning & Requirements, Capacity Cushion Basic inventory model, Sensitivity analysis, Graphic Model, Multiple products & resource constraints, Inventory models with uncertain demand, Single period model Order Quantity – Reorder Point Model, Determining buffer stocks, Inventory control Systems, ABC classifications, MRP, JIT, Introduction to Dynamic lot sizing	
Module II - Linear Programming, Integer Programming & Goal Programming	**30%**
Linear programming: Linear Programming, General Mathematical Formulation of LPP, Graphical Analysis, Simplex Method, Big M-Method. Duality and Post Optimality Analysis, Advantage and Limitations of LPP Integer Programming: Integer-Programming Models, Formulating Integer Programs, Integer Programming. Goal Programming: Introduction to Goal Programming, Graphical method for Goal Programming, Illustrative example on Goal Programming.	
Module III - Transportation, Assignment Models, Job Sequencing & Queueing Theory	**20%**
Transportation problem: Introduction, Formulation of Transportation Problem (TP), Transportation Algorithm (MODI Method), the Initial Basic Feasible Solution, Moving Towards Optimality Assignment Problem: Introduction & Formulation of Assignment problem, Hungarian method to solve Assignment problem Sequencing Problem: Johnsons Algorithm for n Jobs and Two machines, n Jobs and Three Machines, Two jobs and m Machines Problems. Queueing Theory: Characteristics of a Waiting-Line System, Queuing Costs, Variety	

Modules	Weightage (%)
of Queuing Models	
Module IV - Decision Theories & Simulations Modelling	**20%**
Decision-Making Environments and Structuring Decisions: Decision-making under certainty, uncertainty and risk situations; Structuring Values, Fundamental and Means Objective, Influence diagram and fundamental objectives hierarchy, Imperfect information, sequential decisions, Uses of Decision tree Decision Making with AHP: Analytical Hierarchical Process Theory, AHP Step-By-Step Validation, The Ratings Mode, Group Decisions. Introduction to Simulations: Methodology of Simulation, Basic Concepts, Simulation Procedure, Application of Simulation, Advantages of Simulation, Limitations of Simulation	

Pedagogy for Course Delivery	:	Mathematical models through discussions and assignments shall be delivered during lectures and tutorials. Real time scenario and cases shall be used for securing the concept and to elaborate detail application.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	Lab / Practical / Studio (%)
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			End Term Examination
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30

Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

Textbooks

1. Vohra N. D. 2009, *Quantitative Techniques in Management*, Fourth edition, Tata McGraw Hill.
2. Render, B., 2018. *Operations Management Sustainability And Supply Chain Management*. Pearson India.

Reference Books

1. Taha, Hamdy (2003), *Operations Research*, 7th edition, (USA: Macmillan Publishing Company)

Any Other Study Material:

2. Relevant readings and case studies shall be provided from time to time, as required

Cost Management for PPP projects

Course Title	:	Cost Management for PPP projects
Course Code	:	AUMCM783
Credit Unites	:	5

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	2	0	2	0	5

Course Objective	:	This course is intended to make students understand the aspects of cost planning, cost budgeting, cost control and cost risk allocation of PPP projects. The aim of this course is to enhance the ability to quantify the cost variations in the cost management process for PPP projects.

Pre-requisites	:	The students are expected to have knowledge in the following: • Quantification and costing of construction works/Cost Planning and management • Understanding of various sectors of construction and related policies and regulations

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Identify and explain the rationale for formulating PPP projects using Value for Money (VfM) concepts. CO2.Assess the whole life cycle value of PPP projects, with emphasis on financing and procurement processes. CO3. Analyze and evaluate project costs and budget forecasts for PPP initiatives. CO4.Develop cost control benchmarks and mechanisms for PFI/PPP projects across construction, operation, and maintenance stages. CO5.Monitor and determine cost variations at different stages of the PPP project life cycle. CO6.Design and recommend appropriate cost risk allocation strategies to ensure financial sustainability of PPP projects.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – VFM Rationale and procurement	**20%**
PFI/PPP/PSP, Economic rationale, Challenges for cost planning, Whole life cycle value exchange, whole life cycle value creation, maximizing the value, Procurement options, contract structure and governance, financing PPP projects, sources of project finance, financing strategies, payment mechanisms in PPP projects	
Module II - Cost Planning of PPP projects	**30%**
Capital budgeting principles, economic evaluation of projects, using cost indices in PPP projects, project cash flow, costing process, collecting the cost information, contingency planning, costing the project brief, evaluating alternative solutions	
Module III – Cost budgeting and cost control	**30%**
Capital cost budget planning, estimating operating cost budget, repair and maintenance budget, disposal and decommissioning budget, setting control benchmarks and mechanisms, setting cost control benchmarks, controlling costs	
Module IV – Risks in costing PPP projects	**20%**
Life cycle of risk management in PPP, Uncertainty in costing, Impact of risk on PPP project costs, risk of capital cost variation, cost risk allocation – design and construction, project finance risk, performance risks, variability of revenue risk, residue value risk	

Pedagogy for Course Delivery	:	Pedagogy for course delivery include lecture presentations, industry related case studies and tutorials include problems, student presentations and caselets. Student presentations would focus on group presentations and individual viva. Self-work would cover the understanding of different successful PPP projects and their success factors.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & Reference Books

1. Abdelhalim Boussabaine (2013), *Cost Planning of PFI and PPP Building Projects*, Taylor and Francis group.
2. Abdelhalim Boussabaine (2014), *Risk Pricing Strategies for Public-Private Partnership Projects*, Wiley Blackwell.
3. Donald Towey (2012), *Construction Quantity Surveying – A practical Guide for Contractor's QS*, John Wiley & Sons, Limited.
4. Chitkara, K.K. (2012), *Construction Project Management - Planning, Scheduling and Controlling (2nd Ed.),* Tata McGraw Hill.
5. Jha, K.N. (2011), *Construction Project Management - Theory and Practice*, Pearson Education, New Delhi.
6. Potts, K. (2008), *Construction Cost Management: Learning from Case Studies*, Taylor and Francis.

Any Other Study Material:

1. RICS Guidance notes

Digital Skills for Built Environment

Course Title	:	Digital Skilla for Built Environment
Course Code	:	AUMCM782
Credit Unites	:	5

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	2	0	2	0	5

Course Objective	:	This subject aims to provide to create a digitally-enabled information landscape to allow the optimization of the built environment throughout the construction, manufacturing, maintenance, operations and decommissioning phases, introduces concepts of structured collaboration, data exchange, interoperability and life cycle information management. The subject will also allow for the optimization of the business services delivered through the built environment.

Pre-requisites	:	Knowledge of AutoCAD, data management and interpolation, mapping.

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to:
		CO1. Explain the principles of digital communication technologies and their role in the built environment. CO2. Apply digital communication technologies to support project design, planning, and execution. CO3. Create basic digital models using descriptive and simulative CAD software for construction and design tasks. CO4. Modify and refine digital models to represent project requirements and optimize design outputs. CO5. Interpret and evaluate digital documentation used in development approvals, building certification, tendering, and construction processes. CO6. Utilize large data sets and parametric applications to analyze, visualize, and support decision-making in the built environment.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - Introduction to Digital Technology	**25%**
Introduction to information technology in the built environment. This includes: Computer Aided Design (CAD), Building Information Modelling (BIM), Geographic Information Systems (GIS), Web Portals, Project Information Management Systems, Digital Fabrication, Virtual Reality (VR) and Augmented Reality (AR); Developing simple 3D modelling techniques; Digital documentation techniques; Digital communication techniques.	
Module II – BIM, Lean design and construction	**35%**
Critically evaluate key issues in the management of integrated BIM based projects. The module also provides an understanding of how process and technology changes can support better value generation through design. Building industry challenges and opportunities; The business value of BIM and integrated design; Design collaboration; Lean construction/ production; Continuous improvement; Process design and implementation; Process mapping analysis; Integrating project lifecycles	
Module III – Parametric applications in Built Environment	**40%**
Critical awareness and appreciation of sustainable urban and building design to the development of sustainable communities. It describes design methods and assessment techniques for sustainable community design and development. Sustainable urban development theory; Sustainable building design; Introduction to GIS; Using Digimap to download maps; Digitising in ArcMap and draping in ArcScene; GIS and remote sensing; Image manipulation and classification; Raster GIS introduction; suitability mapping and modelling with QGIS; Reclassification, digitising and problem-solving in QGIS; Mapping procedures	

Pedagogy for Course Delivery	:	Theoretical concepts shall be imparted during lecture and tutorials. Practical to familiarize the technology

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**

100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Practical	0
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

Textbooks

1. *Digital Participation and Collaboration in Architectural Design 1st Edition* (2018) By Richard Laing.

Reference Books

1. *RICS Built Environment conference proceeding*.
2. *BIM Hand book*.
3. *Geospatial Analysis: A Comprehensive Guide to Principles, Techniques and Software Tools* by De Smith, M. J., Goodchild, M. F., & Longley, P (2008).
4. *Beyond Mapping Compilation Series* by Barry, J.K. (1993).

OPEN ELECTIVES

Energy Management for Built Environment

Course Title	:	Energy Management for Built Environment
Course Code	:	AUMCM793
Credit Unites	:	5

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	2	0	2	0	5

Course Objective	:	The course is designed to provide the student with an understanding of energy management in Built environment. Due to increased emphasis on energy efficiency, there is a strong need for professionals who understand technicalities of energy management and can conduct energy audits.

Pre-requisites	:	Knowledge of built environment

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to:
		CO1. Describe the principles, processes, and applications of energy management in the built environment. CO2. Conduct energy audits to assess and report on energy usage in buildings and infrastructure. CO3. Evaluate the energy efficiency of thermal equipment used in construction and building services. CO4. Assess the energy efficiency of electrical equipment and propose measures for improvement. CO5. Identify, locate, evaluate, synthesize, and present current research and information on environmental issues related to energy. CO6. Analyze decision-making processes from an energy efficiency perspective and communicate findings and recommendations effectively to stakeholders.

Course Content / Syllabus:

Modules	**Weightage (%)**

Module I - General Aspects of Energy Management and Energy Audit	**25%**
Energy scenario; Energy Conservation Act 2001 and related policies; Basics of Energy and its various forms; Discovery of various energy sources: Energy Sources and Overall Energy demand and availability, Energy Consumption in various sectors and its changing pattern, Exponential increase in energy consumption and Projected future demands. Energy Resources: Coal, Oil, Natural Gas, Nuclear Power and Hydroelectricity, Solar and Other Renewable etc. Depletion of energy sources and impact exponential rise in energy consumption on economies of countries and on international relations.	
Module II - Energy Efficiency in Thermal Utilities	**20%**
Basic Units, Dimensions and Conversions For Energy, Concepts of Energy, Heat and Work, Ideal gas law, Ist and IInd law of thermodynamics. Fuels and Combustion; Boilers; Steam system; Furnaces; Insulation and Refractories; Fluidized Bed Combustion FBC boilers; Cogeneration; Waste Heat Recovery; Heat exchangers	
Module III - Indian Energy Scenario	**35%**
Impact of Energy on Economy, Development and Environment, Energy for Sustainable Development, Energy and Environmental policies, Need for use of new and renewable energy sources. Status of Nuclear and Renewable Energy: Present Status and future promise Energy Policy Issues: Fossil Fuels, Renewable Energy, Power sector reforms, restructuring of energy supply sector, energy strategy for future. 5 Energy Conservation Act-2001 & its features, Electricity Act-2003 & its features. Framework of Central Electricity Authority (CEA), Central & States Electricity Regulatory Commissions (CERC & ERCs), Demand side management	
Module IV - Energy Policy	**20%**
Global Energy Issues, National & State Level Energy Issues, National & State Energy Policy, Industrial Energy Policy, Energy Security, Energy Vision. Energy Pricing & Impact of Global Variations. Energy Productivity (National & Sector wise productivity).	

Pedagogy for Course Delivery	:	Theoretical concepts shall be imparted during lecture and tutorials. Cases, discussions and assignments shall be used for anchoring of concepts and to elaborate practical application.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**

100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

Textbooks

1. *Energy for a sustainable world*: Jose Goldenberg, Thomas Johansson, A.K.N. Reddy, Robert Williams (Wiley Eastern) (1987). Reading material as provided during the lectures
2. Mallick, Amiya Ranjan. *Practical Boiler Operation Engineering and Power Plant*. 4th Revised edition. Place of publication not identified: PHI Learning, 2015.

Reference Books

1. *Energy policy for* : B.V. Desai (Wiley Eastern),
2. *Modeling approach to long term demand and energy implication* : J.K. Parikh (1981)
3. *Energy Policy and Planning*: B. Bukhootsow.
4. TEDDY Year Book Published by Tata Energy Research Institute (TERI).
5. *World Energy Resources*: Charles E. Brown, Springer 2002.
6. *'International Energy Outlook'* -EIA annual Publication
7. *Heat and Thermodynamics* – M.W. Zemansky (McGraw Hill Publication) (1997).
8. *Principles of Energy Conversion: A.W. Culp* (McGraw Hill International edition) (1991).

Due Diligence, Capital Allowances and Insurance

Course Title	:	Due Diligence, Capital Allowances and Insurance
Course Code	:	AUMREAL
Credit Unites	:	5

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	2	0	2	0	5

Course Objective	:	The Course is designed to provide knowledge in the process of Due diligence at various stage of project, technology used to scrutinize the process, to have understanding of various insurance products used in construction industry to mitigate risk and able to compare these with respect to global Insurance products.

Pre-requisites	:	Knowledge of Accounting principle and procedures, Construction Contracts, Risk Management in Construction

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Demonstrate knowledge and understanding of the processes and various types of due diligence in construction projects. CO2. Explain the stages and documentation requirements involved in conducting project due diligence. CO3. Demonstrate understanding of general provisions and capital allowances in the construction sector. CO4. Describe and compare different methodologies used for due diligence in construction projects. CO5. Explain the principles and practices of insurance in construction projects, including policy types. CO6. Discuss the implementation of insurance policies for construction projects, based on project scope and risk factors.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Introduction to Due Diligence	**30%**
Introduction of Due Diligence, Due diligence at various stage of Project, Traditional due diligence, Process of Due Diligence, Disclosures, Various Types of Due diligence and their limitation, Due diligence in corporate finance and governance management issues, Trends, drivers and challenges in due diligence, Insolvency Code – recovery, Technology in Due diligence (Blockchain, Digitalization of Land record, etc.).	
Module II – Due Diligence: Case Studies	**15%**
Business case development and Case studies for Commercial due diligence and Risk management. Environmental due diligence and Risk management. Technology due diligence and Risk management.	
Module III – Capital Allowances (Tax Relief)	**25%**
Overview of Capital Allowance, Different types of Capital Allowances, Capital Allowance based on Location, Special Economic Zones, Industry specific, General provision on tax relief for capital expenditure, Basic documentation to prepare a claim for Capital allowances, Eligibility criteria, Quantification of identified Capital Allowances.	
Module IV – Introduction to Insurance	**30%**
Broad overview of risk in construction and role of Insurance. Insurance clauses in various Construction contracts, Various types of Construction Insurance, Service level agreements and Policies. Documentation Claims preparation and settlement. Insurance Regulations bodies in India, Global Insurance products and their comparison with respect to India market, Case studies related to construction sector.	

Pedagogy for Course Delivery	:	Theoretical concepts through cases, discussions and assignments shall be delivered during lectures and tutorials. Real time scenario and guest visits shall be used for securing the concept and to elaborate detail application.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

1. Linda S. Spedding (2009). *The Due Diligence Handbook: Corporate Governance, Risk Management and Business Planning*. Hungary: CIMA, ELSEVIER
2. Bunni, Nael G. (2003). *Risk and Insurance in Construction. 2nd ed.* London: Taylor and Francis
3. Jha, K.N. (2011), *Construction Project Management - Theory and Practice*, Pearson Education, New Delhi.

Urban Infrastructure Management

Course Title	:	Urban Infrastructure Management
Course Code	:	AUMREAL706
Credit Units	:	5

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	2	0	2	0	5

Course Objective	:	• Understand basics of infrastructure, infrastructure development life cycle and its relationship to built-environment, real estate and construction • Understand stages and processes involved in creation of infrastructure projects and infrastructure management imperatives • Understand need for managing assets and services leading to creation of value in the delivery process • Understand financing needs and financial modes for infrastructure projects/development • Apply learnings of policy and regulation perspectives like 74th Amendment Act.

Pre-requisites	:	None

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Identify different types of infrastructure with emphasis on urban infrastructure, and recognize the roles and responsibilities of stakeholders across the project lifecycle. CO2. Classify project data requirements and demonstrate the ability to collect, process, analyze, and store data for management information systems to support decision making. CO3. Create and explain components of the infrastructure program/project lifecycle and establish linkages with real estate, construction, and management from concept to operation stage. CO4. Understand stages of finance, funding allocation, modes of financing, and project financing to support decision making from a company perspective. CO5. Appreciate the relevance of policy and regulations in shaping various infrastructure subsectors and projects. CO6. Develop and analyze sector-specific project cases, including preparation of an initial screening report and assessment of urban infrastructure management imperatives.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Types of infrastructure, infrastructure development life cycle and processes	**30%**
Meaning and types of infrastructure, role of infrastructure manager in overall project development, infrastructure development life cycle framework, process of infrastructure development, role of policy and regulation in infrastructure development, institutional framework for delivery of infrastructure, data requirements for infrastructure project development, link of infrastructure with built environment, real estate and construction for delivery, investment requirements for infrastructure development at macro level	
Module II – Urban infrastructure management	**20%**
Components of urban infrastructure management, preservation of natural resources alongwith infrastructure development, management perspectives to MIS, principles of designing and developing basic MIS applications, key factors of built environment sphere including physical form, political and economic reasons	

for its development and dependence on local environment and resources, Sustainability through environmental, social safeguard, land acquisition, financial management etc.	
Module III – Delivery of infrastructure	**25%**
Development of infrastructure sub-sectors, scale, scope and distribution of projects across sectors & geographies developments in key sectors – highways, telecom, energy, urban etc., experience in implementing projects.	
Module IV – Role of Stakeholders, financing and Policy enablers	**25%**
Roles and responsibilities of the Stakeholders across the project life cycle, interaction and expectations of users and beneficiaries, government and para-statal agencies, private sector, consultants and advisors, technical, financial and legal, non-government sector, procurement process and rules of business, Project life cycle costs, estimation of capital and operating expenditure, revenue models, user fees and tariffs , source of public finance, role of multilateral, bilateral development agencies, national financial institutions, private finance and approval process, market borrowings, credit enhancement structures, legal, technical and financial diligence, Procurement options for public service delivery including EPC, PPP etc.	

Pedagogy for Course Delivery	:	Pedagogy for course delivery includes theoretical lectures supported by tutorial exercises, industry case studies, and experience sharing by practitioners. Student assignments would include individual and group submissions with focus on presentations.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100%	0%

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

1. India Infrastructure reports, 3i network, yearly documents from 2001 till date
2. Evolving perspectives in the development of Indian infrastructure, Volume 1& 2, IDFC report
3. Dash, L.N., Infrastructure Development and Indian Economy, Regal Publications
4. Joshi, R.N., PPP in infrastructure- Perspectives, Principles & Practices, Vision Books
5. Oriol Nel. Lo and Renata Mele, Cities in the 21st Century, Routledge, 2016
6. Salet William and Gualini Enrico, Framing strategic Urban projects, Routledge, 2007
7. Rosentraub S. Mark, Reversing Urban Decline, CRC press, 2014
8. Delmon Jeffrey, Private sector investment in infrastructure, Wolters Kluwer, 2009
9. Yescombe E.R., Public Private Partnerships, BH, 2007
10. Grimsey Darrin and Lewis Mervyn K., The Economic of Public Private Partnerships, Edward Elgar publishing, 2005Wellman Kath and Spiller Marcus, Urban Infrastructure Finance and Management, Willey –Blackwell, 2012
11. Jetli K. Narindar and Sethi Vishal, Infrastructure Development in India, New Century Publications, 2007

Any other Study Material:

1. India infrastructure magazines- www.indiainfrastructure.com
2. Ministry of finance- http://finmin.nic.in/
3. Department of economic affairs- Ministry of finance- www.pppinindia.com
4. Niti Aayog/ Erstwhile Planning commission material as considered appropriate

Advanced Real Estate Valuations

Course Title	:	Advanced Real Estate Valuations
Course Code	:	AUMREAL708
Credit Unites	:	5

L	T	P	SW	FW	Total Credits
2	2	0	2	0	5

Course Objective	:	Expose students to complex real estate valuation situations, business practices and its reporting. Students will learn to undertake valuation with professional precision, and turnaround time.

Pre-requisites	:	Should have taken course on Principles of Asset Valuation. Must have scored at least GPA – A (-) in prerequisite course.

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Understand the issues and complexities involved in the valuation of large land parcels meant for greenfield projects. CO2. Apply appropriate methods to undertake valuation of trade-related properties. CO3. Understand and analyze the valuation approaches for mixed-use commercial properties. CO4. Assess the challenges and considerations in valuing mixed-use developments with multiple asset classes. CO5. Understand and analyze the process of valuation of Real Estate Investment Trusts (REITs). CO6. Evaluate the role of REIT valuation in investment decision-making and portfolio management.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Valuation of large open land parcels	**20%**
Important issues of large lands affecting valuation i.e. ownership, accessibility, contiguous nature, physical features, costs and stakeholders involved. Implications of urban development regulations, real estate market scenario, demand supply parameters, socio – political issues, environmental and other legal aspects in valuation of large land parcels.	
Module II – Valuation of Trade Related Properties	**25%**
Definition of trade related properties, transaction practices of trade related properties, trade related properties as going concern, assessment of business potential, business benchmarking on real estate and financial parameters, profitability, operational aspects, depreciation, role of promoters, market rent, market value, reasonable efficiency, report writing. RICS VPGA 4 – Valuation of Individual Trade Related Properties.	
Module III – Valuation of Core Assets	**25%**
Valuation of large core assets (income generating commercial real estate) both commercial and retail, as standalone properties and portfolio. Its issues, complexities, taxation, lease management, implications and importance of leverage. Importance of asset management aspects on valuation of core assets.	
Module IV – Valuation of REIT Assets	**25%**
Definition of REIT, its importance, need, history and operating mechanisms. International and nations perspective of REIT, its performance and acceptability as investment instrument. Regulatory regime of REIT in India. Valuation process of REIT. REIT Case Study.	

Pedagogy for Course Delivery	:	1. Student Lecture: To support the development of concepts and methods 2. Problem Solving Exercises: More interactive learning including students on a specific problem and solutions to it 3. Data analysis using case studies: To expose students to variety of situation and making them understand in comprehensive manner 4. Presentations and Group Discusses ions for mutual peer learning. 5. Attending conferences and seminar for industry exposure on subject matter.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	Lab / Practical / Studio (%)
100%	0%

Theory Assessment:

Continuous Assessment / Internal Assessment			End Term Examination
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

1. Scarrett. D. Property Valuation – The Five Methods, Routledge, Taylor and Francis, London and New York
2. B. Andrew, M. David, N. Nick, The Income Approach to Valuation, Routledge, Taylor and Francis, London and New York
3. Nanavati, R. Theory and Practice of Valuation, Lakshmi Book Depot, Mumbai.
4. Rangawala, S.C. Valuation of Real Properties, Chatwar Publishing House.
5. RICS Valuation – Global Standards 2017
6. International Valuation Standards - 2017

Any Other Study Material:

1. Class lecture notes/ presentations.
2. Industry report on real estate markets

3. Insolvency and Bankruptcy Code - 2016.
4. Sample valuation repots

Marketing Communication and CRM

Course Title	:	Marketing Communications & CRM
Course Code	:	AUMREAL707
Credit Unites	:	5

L	**T**	**P**	**SW**	**FW**	**Credits**
2	2	0	2	0	5

Course Objective	:	1. Understand the role of Marketing Communication in the 2. Marketing department. Structure and overall business 3. Understand Marketing Communication types 4. Understand Integrated Marketing Communications 5. Understand how to devise Marketing Communication Strategies for Real Estate;

Pre-requisites	:	Any Graduate student with or without work-experience.

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Understand the core concepts, principles, and scope of Marketing Communications (MC). CO2. Explain the role of Marketing Communications within the broader sales and marketing function. CO3. Apply Marketing Communications strategies to real-world sales and marketing situations. CO4. Demonstrate the ability to design communication approaches that support customer engagement and retention. CO5. Correlate the use of Marketing Communications with Customer Relationship Management (CRM) practices.

		CO6. Evaluate how effective Marketing Communications contribute to improving business prospects and long-term client relationships.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I: Types of Communication Platforms	**30%**
Lead Generation and Qualification, Marketing for Lead Generation, Marketing Communications Planning Process, Introduction to major Marketing Platforms - Advertising, Sales Promotion, Events & Experience, Public Relations, Direct Marketing, Interactive Marketing and Social Media Management, Word of Mouth, Personal Selling	
Module II – Preparation of Integrated Marketing Communications Strategy	**20%**
Product and Brand Positioning, Preparing effective IMC Strategies, Social Media Marketing, Content Marketing, Viral Marketing and crafting Contagious Content.	
Module III – CRM – An important Management Tool	**20%**
Understanding Customer Satisfaction, Customer Expectations & Perception, Achieving Customer Satisfaction, Customer Delight, Handling Difficult Customers, Growing your Customer base, Dealing with complaints, Handling Customer Complaints	
Module IV – CRM in Real Estate	**20%**
CRM for Sales Management, Effective Service Delivery, Efficient Payment Recovery, Ensuring Customer Delight, Managing CRM Process from Sales Enquiry to Advocacy, Communications for CRM	
Module V – Ethics in Real Estate	**10%**
NAR, NAR(I), CREDAI, BAI, Code of Ethics	

Pedagogy for Course Delivery	:	Pedagogy would include classroom lectures, Case Studies, interaction with industry experts, guest lectures, self-work and assignments.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

1. Marketing – A South Asia Perspective by Phillip Kotler, Kevin Keller, Abraham Koshy and Mithileshwar Jha.

Any Other Study Material:

1. Case Studies to be shared from time to time during the duration of the course
2. LinkedIn Content Marketing Toolkit

Advanced Facilities Management

Course Title	:	Advanced Facilities Management
Course Code	:	AUMREAL717
Credit Units	:	5

L	T	P	SW	FW	Total Credits
2	2	0	2	0	5

Course Objective	:	The course provides an advanced level of understanding about building operations and management, FM technology, bye laws and legislations and ISO certification procedures, integrated facilities & asset management 1. Imparting understanding of the need to develop and innovate effective facilities management (FM) at operational, managerial and strategic levels 2. Identify key factors that contribute to effective and efficient property maintenance 3. Assimilate the key techniques and methods needed for effective FM which preserve and enhance quality of life in a building

Pre-requisites	:	Must have taken Facilities Management course in previous semester.

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Appraise and describe the nature of facilities management and the factors influencing maintenance requirements. CO2. Recognize the responsibilities delegated to facilities management teams and the range of roles, including strategic infrastructure asset management. CO3. Interpret and compare different service delivery models for facilities management. CO4. Assess key stakeholders in facilities management and explain their roles and responsibilities.

		CO5. Evaluate the scope of work and Service Level Agreements (SLAs) in facilities management practice. CO6. Understand and describe the regulatory and compliance requirements for the operation and management of facilities.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - Facilities Management Strategy, Operations & Management	**40%**
Facilities Management Strategy; Workplace Strategy; Facilities Planning ; Outsourcing vs In House Facilities Management –Policy & Procedures ; Service Specifications, Operations & Management Agreements ; Service Level Agreements & Performance Management ; Benchmarking best practices; Building Automation Systems (BAS) & Intelligent Buildings, Computer Aided Facilities Management (CAFM), Integrated Workplace Management Systems (IWMS), ARCHIBUS , Building Information System (BIM) & Facilities Management.	
Module II - Building Legislation : Regulatory Issues & Integrated Approach to Quality , Safety, Health & Environmental Aspects (including ISOs)	**40%**
Building Byelaws; National Building Code,2016 - its scope , definitions & preview; Important provisions from various chapters; Building Compliances – Lift, Fire & Life Safety, Delhi/Haryana Apartment Acts Integrated approach to Quality , Safety, Health & Environmental Aspects (including ISOs 9001, 14001 & 18001) ISO 41001 Facilities Management ISO 55001 Asset Management ISO 50001 Energy Management System Sustainable Facilities Management- (Chapters 11& 12 NBC 2016)	
Module III - Strategic Infrastructure Asset Management :	**20%**
Strategic Infrastructure Asset Management : whole life of asset, optimize returns by performance scrutiny throughout assets lifecycle, Business Continuity/Emergency Response Procedures	

Pedagogy for Course Delivery	:	1. Student Lecture: To support the development of concepts and methods

		2. Site Visits: To observe & learn regarding facilities operational aspects & facilities equipment. 3. Problem Solving Exercises: More interactive learning, including students on a specific problem and solutions to it 4. Case studies: To expose students to variety of situations and make them understand in comprehensive manner

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100%	0%

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

Textbook

1. Atkin, B. & Brooks, A. (2009) Total Facilities Management, 3rd edition, Wiley-Blackwell

Reference Books

1. Barret, P. & Baldry, D. (2004) Facilities Management, Towards Best Practice, 2nd edition, Blackwell Publishing

2. Cotts, David G., Roper, Kathy O., Payant, Richard P. (2010) The Facility Management Handbook, Third Edition, AMACOM.
3. Booty, Frank (2009) Facilities Management Handbook, Fourth Edition, Butterworth-Heinemann.
4. National Building Code (NBC) of India, 2016
5. RICS Professional Guidance, Global: Strategic Facilities Management , First Edition
6. RICS Strategic Facilities Management: Case Studies, October 2016
7. RICS IFMA Strategic FM Framework RICS guidance note, Global 1st edition, April 2018
8. RICS professional guidance, UK Resource management: improving efficiency and reducing waste 1st edition, June 2016
9. Raising The Bar: From Operational Excellence To Strategic Impact In FM - MARCH 2017 : Report for Royal Institution of Chartered Surveyors and International Facility Management Association Report written by: James Ware, PhD , Global Research Director Rob Harris, PhD, Regional Partner, UK & Ireland
10. RICS Public Sector Asset Management Guidelines-a guide to best practice edited by Keith Jones and Alan D White
11. Journal articles and others

Planning and Development of special Real Estate projects

Course Title	:	Planning and Development of special Real Estate projects
Course Code	:	AUMREAL799
Credit Units	:	5

L	T	P	SW	FW	Total Credits
2	2	0	2	0	5

Course Objective	:	This course shall expose students to real life project planning and development challenges of large real estate projects like township, SEZ, family entertainment centers (FEC), etc. It will make them appreciate project planning and implementation process starting from project acquisition, market research and product formulation, to project financing and its formulation of marketing strategy across various asset classes. This course will also familiarize students with various risks and uncertainties in implementation of specialized real estate projects.

Pre-requisites	:	Students must know Basics of Real Estate, Real Estate Market Research and Principles of Asset Valuation.

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Understand land acquisition processes and urban governance issues relevant to large real estate projects. CO2. Analyze real estate markets and conduct systematic market research to support project planning. CO3. Design detailed product mix strategies based on market research findings and project requirements. CO4. Understand various sources of project finance and apply cash flow analysis techniques for real estate projects. CO5. Formulate marketing strategies for real estate projects

		across different stages of the project life cycle. CO6. Identify and evaluate business risks associated with real estate projects and propose mitigation measures.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Land Procurement & Market Research	**25%**
Land procurement and project acquisition process, suitability of land parcel, planning control and supply of land for development, greenfield and brownfield project acquisition. Objective and scope of the study, market research for various asset classes, factors impacting demand and supply, economic scene, site and market analysis, market data collection, product mix formulation, highest and best use application.	
Module II – Business Planning & Cash-flow Analysis	**25%**
Sources of finance for development, understanding product and developer funding requirement, expansion strategy (geography, asset class, joint venture, etc.), application of residual (the hypothetical valuation) and DFC method of valuation, application of IIR, NPV, DSCR, etc.	
Module III – Marketing Strategies	**25%**
Marketing strategies for various asset classes, timing of marketing, marketing tactics, selling vs leasing strategy, the timing of disposition. Who, what, where, when and how of marketing plan.	
Module IV – Project Implementation & Risks	**25%**
Key challenges in the implementation of a project, risks and uncertainty, various stages of project and corresponding risks – pre approval risk, construction risk and post completion risk. Various risks and their mitigation strategies, and cost of risk.	

Pedagogy for Course Delivery	:	Lecture Tutorial exercises Learning by doing / workshops Learning by experience / site visits Learning by expert interactions

		Learning by secondary data Class presentations / group discussions Attending seminars / conferences

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100%	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

1. Brett, D. and Schmitz, A. (2009), *Real Estate Market Analysis Methods and Case Studies*, 2nd ed., Urban Land Institute, Washington D.C.
2. Fanning, S.F. (2005), *Market Analysis for Real Estate: Concepts and Applications in Valuation and Highest and Best Use*, Appraisal Institute.
3. Reed, R. and Sims, S. (2015), *Property Development*, Sixth., Routledge, London & New York.

Any Other Study Material:

1. Gupta, A., Newell, G., Bajaj, D. and Mandal, S. (2018), "Identifying the risk factors in Indian non-listed real estate funds", *Journal of Property Investment and Finance*, Vol. 36 No. 5, pp. 429–453.
2. Class lecture notes / presentations.
3. Industry report on real estate markets
4. Sample market research reports

Project and Mortgage Finance for Built Environment

Course Title	:	Project and Mortgage Finance for Built Environment
Course Code	:	AUMREAL792
Credit Units	:	5

L	T	P	SW	FW	Total Credits
2	2	0	2	0	5

Course Objective	:	Subject shall familiarize students with Project Financing and related Risks. The Structure, function and types of housing finance and Mortgage systems. Impart the ability to understand the sector's importance in lieu of the broader economic and financial systems.

Pre-requisites	:	• Financial Management and Capital Markets • Introduction to Economics • Understanding of project based organisations

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Develop an understanding of project financing structures used in real estate and infrastructure projects. CO2. Identify and analyze risks associated with project financing and apply appropriate mitigation techniques. CO3. Understand the size, structure, and key players of the real estate capital markets for public and private debt. CO4. Understand the size, structure, and key players of the real estate capital markets for public and private equity. CO5. Recognize and assess the risks and returns inherent in real estate capital markets.

		CO6. Evaluate investment performance in real estate capital markets using appropriate financial metrics and techniques.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Introduction to Project Finance	**25%**
Project Financing Structure and Participants: Debt, equity, developers, consultants, offtakers, sponsors, operators, law firms, consultants, construction and engineering firms, political and regulatory bodies. Project Finance Market: Role of Advisors in Project Finance, Project Development and Management, Valuing the Project and Analysis of Project Cash Flows, Project Financial Feasibility.	
Module II – Project Financing Risk and Credit Agreement	**25%**
Project Risks and Mitigants: Markets, currency, construction, technology, offtakers, input supplies, operations, sponsors, political, environmental and regulatory, commercial & macroeconomic risks associated with projects, Risk Mitigation Techniques for Projects. Credit Agreements: pricing, terms, conditions, covenants, representations and warranties, events of default.	
Module III – Role of Private Equity and Mezzanine Finance	**25%**
Private Equity: Introduction, Agreement, Organization, compensation, regulation and limited partners. The economics of private equity: Funding, Term Sheet, debt as private equity; structured products and hybrid instruments; Organization, compensation, regulation and limited partners; exit process and the outcome Mezzanine finance: review of hybrid debt instruments, last mile financing, changing preferences of funds in structuring their deals.	
Module IV – Mortgage and Housing Finance in India	**25%**
Overview of housing finance: HFCs, MMHFCs, NBFCs, Non-banking non-financial, Banks etc. Mortgage market: primary mortgage market, secondary mortgage market; types of mortgages: origination, marketing, screening, processing, loan tracking, evaluation; mortgage servicing; Law and enforcement of mortgages under Indian law Financing housing finance: Bank financing; HFC financing, foreign investments, role of NHB; capital market instruments. RMBS/CMBS instruments; Securitization of residential mortgage: meaning and structuring, structuring of	

RMBS transaction	

Pedagogy for Course Delivery	:	• Learning outcomes include developing students' knowledge with respect to theoretical aspects and industry practice. Accordingly pedagogy for course delivery includes theoretical lectures supported by industry case studies. Student assignments would include individual and group submissions with focus on presentations. • In conjugation with other subjects this course aims for the following competencies: • Property/ Project Financing and Funding • Investment Management • Housing Finance

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15

Total Hours	**150**

Text & References:

1. Brueggeman, W. and Fisher, J. (2010), Real estate finance and investments, Mc-Graw Hill Education.
2. Ben-Shahar, D., Leung, C. and Ong, S-E (2008), Mortgage markets worldwide, Blackwell publishing.
3. Smith, S.J. (2012), International Encyclopedia of Housing and Home, Elsevier.
4. King, P. (2009), Understanding Housing Finance: Meeting Needs and Making Choices, Routledge.
5. Jain, R. (2011), Housing Finance in India, A.K. Publications
6. Chiquier, L. and Lea, M.J. (2009), Housing Finance Policy in Emerging Markets, World Bank Publications
7. Prasanna Chandra (2006), Projects-Planning Analysis, Selection, Financing, Implementation and Review, 6th edition, 2006.
8. Gopalakrishnan (2007), Project Management, Tata McGraw Hills Publications.
9. Samnel. J. Montel, Jack. R. Meredith and Scott. M. Shafer Margaret .M. Sutton with M. R. Gopalan (2006), Project Management, 1st edition, Wiley India.

Valuation of Special Projects

Course Title	:	Valuation of Special Projects
Course Code	:	AUMREAL711
Credit Unites	:	5

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	2	0	2	0	5

Course Objective	:	Expose students to valuation of real estate assets as part of financing mechanism of large urban projects such as transport projects, industrial projects or large theme parks/ urban renewal projects.

Pre-requisites	:	Should have taken course on Principles of Asset Valuation. Must have scored atleast GPA – A (-) in prerequisite course.

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Understand the importance of real estate in financing large urban development projects such as metro rail, exhibition centers, and convention centers. CO2. Analyze financing models of urban development projects and evaluate the contribution of real estate assets. CO3. Undertake valuation of real estate using appropriate approaches and techniques. CO4. Apply valuation outcomes to assess feasibility and financing potential of urban development projects. CO5. Explain the role of real estate in municipal and urban development financing through bonds and other tradable instruments. CO6. Evaluate the effectiveness of bonds and other tradable

		instruments as mechanisms for mobilizing funds in urban development.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Valuation of large open land parcels	**25%**
Important issues of large lands affecting valuation i.e. ownership, accessibility, contiguous nature, physical features, costs and stakeholders involved. Implications of urban development regulations, real estate market scenario, demand supply parameters, socio – political issues, environmental and other legal aspects in valuation of large land parcels.	
Module II – Valuation of Trade Related Properties	**25%**
Definition of trade related properties, transaction practices of trade related properties, trade related properties as going concern, assessment of business potential, business benchmarking on real estate and financial parameters, profitability, operational aspects, depreciation, role of promoters, market rent, market value, reasonable efficiency, report writing. RICS VPGA 4 – Valuation of Individual Trade Related Properties.	
Module III – Valuation of Core Assets	**25%**
Valuation of large core assets (income generating commercial real estate) both commercial and retail, as standalone properties and portfolio. Its issues, complexities, taxation, lease management, implications and importance of leverage. Importance of asset management aspects on valuation of core assets.	
Module IV – Valuation of REIT Assets	**25%**
Definition of REIT, its importance, need, history and operating mechanisms. International and nations perspective of REIT, its performance and acceptability as investment instrument. Regulatory regime of REIT in India. Valuation process of REIT. REIT Case Study.	

Pedagogy for Course Delivery	:	1. Student Lecture: To support the development of concepts and methods 2. Problem Solving Exercises: More interactive learning including students on a specific problem and solutions to it 3. Data analysis using case studies: To expose students to variety of situation and making them understand in comprehensive manner 4. Presentations and Group Discusses ions for mutual peer learning. 5. Attending conferences and seminar for industry exposure on subject matter.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100%	0%

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

1. Scarrett. D. Property Valuation – The Five Methods, Routledge, Taylor and Francis, London and New York
2. B. Andrew, M. David, N. Nick, The Income Approach to Valuation, Routledge, Taylor and Francis, London and New York
3. Nanavati, R. Theory and Practice of Valuation, Lakshmi Book Depot, Mumbai.
4. Rangawala, S.C. Valuation of Real Properties, Chatwar Publishing House.
5. RICS Valuation – Global Standards 2017
6. International Valuation Standards - 2017

Any Other Study Material:

1. Class lecture notes/ presentations.
2. Industry report on real estate markets
3. Insolvency and Bankruptcy Code - 2016.
4. Sample valuation repots

Environment and Social Impact Assessment of Real Estate Project

Course Title	:	Environment and Social Impact Assessment of Real Estate Project
Course Code	:	AUMREAL800
Credit Units	:	5

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	**2**	**0**	**2**	**0**	**5**

Course Objective	:	This course aims at providing students with knowledge and application of the theory and practice of Social Impact Assessment (SIA) and Environment Impact Assessment (EIA) in the built environment sector. This course focusses on procedures, tools and techniques used for preparing EIA & SIA reports for projects in built environment

Pre-requisites	:	Nil

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Critically examine the assumptions integral to impact assessment of projects in the built environment. CO2. Demonstrate knowledge of social and environmental impact assessment frameworks and methodologies. CO3. Apply skills to undertake social and environmental impact assessments for built environment projects. CO4. Develop resilient strategies to address urban vulnerabilities and sustainability challenges. CO5. Explore and analyze the role of advanced technologies such as big data, artificial intelligence, and robotics in urban management. CO6. Evaluate the application of advanced technologies in solving

		sustainability challenges in the built environment.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Environment Impact Assessment (EIA)	**25%**
Introduction to Environment Management & EIA, Legal, Policy & Regulatory Framework, EIA Procedure - Scoping & Screening and Establishing Baseline Conditions, EIA Methodologies, Impact Identification & Analysis of Alternatives	
Module II – Environment Management Plan (EMP)	**25%**
Impact Management - Mitigation & Preparation of Environment Management Plans (EMP), EIA Reporting & Review of EIA Quality, Conduct screening, scoping, report review stages of EIA , Decision Making & Project Management, Case Studies from Built Environment sector, The future for EIA	
Module III – Social Impact Assessment (EIA)	**25%**
Understanding the socio-cultural, ecological environment of Project-Affected-People, Detailed analysis of the provisions of The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation & Resettlement (RFCTLARR) Act, 2013, insights into the rationale of the legal tenets, challenges to its implementation and future prospects. Issues in livelihood restoration	
Module IV – Social Impact Mitigation	**25%**
Preparation of SIA report, preparation and implementation of SIMP and R&R Scheme and Development Plan. procedural requirement of stakeholder identification, stakeholder consultation and consent generation, public reporting, monitoring and post implementation social audit, Learning from the global best practices in social impact management and rehabilitation in the past, mitigate measures	

Pedagogy for Course Delivery	:	• Lecture • Tutorial exercises • Learning by doing / workshops • Learning by experience/site visits • Learning by expert interactions • Learning by secondary data

		• Class presentations / group discussions • Attending seminars/conferences

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100%	0%

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

1. Asian Development Bank (1994) Handbook for the Incorporation of Social Dimension in Projects. Social Development Unit, Asian Development Bank, Manila, Philippines.
2. Berger T (1994) The Independent Review of the Sardor Sarovar Projects, 1991-1992. Impact Assessment 12:1, 3-20.
3. Burdge R and Vanclay F (1995) Social Impact Assessment in Vanclay F and Bronstein D (eds) Environmental and Social Impact Assessment (pp. 31-65). John Wiley & Sons, Chichester, UK.

4. Cernea M and Kudat A (eds) (1997) Social Analysis for Investment Projects: Rationale, Content and Methods. ESSD Monograph 16, World Bank, Washington, D.C.
5. Finsterbusch K, Ingersoll J and Llewellyn L (1990) Methods for Social Analysis in Developing Countries. Westview Press, Boulder, Colorado, USA.
6. Glasson, J., Therivel, R. and Chadwick, A. (2012) Introduction to Environmental Impact Assessment, 4th edition, Routledge, London.
7. Goodland R (1999) Social and Environmental Assessment to Promote Sustainability. Paper presented to the Annual Meeting of the International Association for Impact Assessment, Glasgow. (Informal draft available from Environment Department, World Bank, Washington, D.C.)
8. Holder, J. and McGillivray, D. (eds.) (2007) Taking Stock of Environmental Assessment- law, policy and practice, Routledge, London.
9. Interorganizational Committee on Guidelines and Principles for Social Impact Assessment (1994) Guidelines and Principles for Social Impact Assessment. Impact Assessment, 12(2): 107-152.
10. Lawrence, D.P. (2003) Environmental Impact Assessment: practical solutions to recurrent problems, Wiley-Interscience, New York.
11. Lee, N. and George, C. (eds.) (2000) Environmental Assessment in Developing and Transitional Countries, Wiley, Chichester
12. Morris, P. and Therivel, R. (eds.) (2009) Methods of Environmental Impact Assessment, 3rd edition, Routledge, London.
13. Noble, B. (2006) Introduction to Environmental Impact Assessment: a guide to principles and practice, OUP, Oxford.
14. Reitbergen-McCracken J and Narayan D (1998) Participation and Social Assessment: Tools and Techniques (Book and video). Social Development Family, World Bank, Washington D.C
15. Taylor N, Goodrich C and Bryan H (1998) Social Assessment. In Porter A and Fittipaldi J (eds) Environmental Methods Review: Retooling Impact Assessment for the New Century (pp.210-218). The Press Club, Fargo, USA.
16. Therivel, R. and Wood, G. (2017) Methods of Environmental and Social Impact Assessment, Routledge, 4th edition.
17. Vanclay F (1999) Social Impact Assessment. In Petts J. (ed) Handbook of Environmental Impact Assessment (Vol 1, pp. 301-326). Blackwell Science Ltd, Oxford, UK.
18. Wood, C. (2003) Environmental Impact Assessment: A Comparative Review, 2nd edition, Longman, Harlow.
19. World Bank Environmentally and Socially Sustainable Development Knowledge Bank at http://www.worldbank.org
20. World Commission on Dams (2001) Dams and Development: A New Framework for Decision-Making. Earthscan, London (also at) http://www.dams.org

Any Other Study Material:

- Class lecture notes/ presentations.

Valuation of Businesses and Intangible Assets

Course Title	:	Valuation of Businesses and Intangible Assets
Course Code	:	AUMREAL710
Credit Units	:	5

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	2	0	2	0	5

Course Objective	:	Provide an understanding of real estate valuation practices using financial approaches to value businesses and intangible assets.

Pre-requisites	:	Knowledge of Financial Management

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Understand the fundamental steps involved in the business valuation process. CO2. Explain the principles and assumptions underlying different business valuation methods. CO3. Apply appropriate methods of business valuation in theoretical contexts. CO4. Implement business valuation methods in practical, real-world scenarios. CO5. Analyze and compare the suitability of different valuation methods for various types of businesses. CO6. Understand and evaluate the limitations of business valuation models in decision-making.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Introduction	**20%**
Overview of business valuation; Objectives of business Valuation; Importance of business Valuation; Misconceptions; Valuation principles; Key financial and commercial factors affecting the business; Elements of Business Valuation – Economic conditions, Normalization of Financial Statements, Valuation Approach; Types of firm value - market value, fair value, investment value, intrinsic value, liquidation value, book value.	
Module II – Techniques of Valuation	**40%**
Valuation of Shares: Basics of company analysis and stock selection; Dividend Discount Model; Relative Valuation Techniques – Price-Earnings Ratio, Price-Cash Flow Ratio, Price-Book Value Ratio, Price-Sales Ratio; Other Equity Valuation Methods- Graham Method, Pietroski Method Relative Valuation: Definition and description of Relative Valuation; Steps in Relative Valuation; Market Value; Market Multiples; Wide application of Relative Valuation; Advantages and Limitations of Relative Valuation; When to use Relative Valuation Asset Valuation Model: Determining Book Value; Adjusting Book Value; Factors in Asset Valuation.	
Module III – Related Concepts in Business Valuation	**20%**
Balance Sheet Valuation; Equity Multiplier Approach; Sum of the Parts Method; Earnings – Price Ratio, Expected Return and Growth; Forecasting the aggregate stock market returns; The Impact of Changing Capital Structure on the Market Value of the Company; Priorities of Different Stakeholders in terms of Business Valuation.	
Module IV – Valuation of Intangible Assets – Goodwill, Brand Valuation	**20%**
Introduction, Methods of measuring goodwill - Master valuation approach, Capitalization of excess earnings power, Need for Brand Valuation; Approaches of Brand Valuation - Research-based Brand Equity Valuation, Financially - driven Approaches; Steps in Valuation of a Brand.	

Pedagogy for Course Delivery	:	1. Student Lecture: To support the development of concepts and methods 2. Problem Solving Exercises: More interactive learning including students on a specific problem and solutions to it 3. Data analysis using case studies: To expose students to variety of situation and making them understand in comprehensive manner

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

1. Chatterjee, B. D., An Illustrated Guide to Business Valuation (Bloomsbury)

2. Damodaran, Aswath, Damodaran on Valuation: Security Analysis for Investment and Corporate Finance (Wiley Finance)
3. Chandra, Prasanna, Investment Analysis and Portfolio Management (Tata McGraw Hill)
4. Koller, Goedhart and Wessels, Valuation: Measuring and Managing the Value of Companies (Wiley Finance)
5. Pratt, S. P., Valuing a Business: The Analysis and Appraisal of Closely Held Companies (McGraw-Hill)
6. Garg, Kamal, Handbook on Valuation (Bharat)
7. Damodaran on Valuation: Security Analysis for Investment and Corporate Finance (Wiley Finance)

Any Other Study Material:

1. Lecture Notes

Future Cities

Course Title	:	Future Cities
Course Code	:	AUMREAL797
Credit Unites	:	5

L	T	P	SW	FW	Total Credits
2	2	0	2	0	5

Course Objective	:	This course aims at providing students with an understanding of Cities of future and its sustainability with changing technology and citizen preferences. They will be able understand and analyze rapid urbaization and its impact on people and environment. This course will help students estimate future demands and challenges of cities and make them more resilient and sustainable.

Pre-requisites	:	Nil

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to: CO1. Comprehend upcoming urban challenges and formulate strategies for fostering livable cities. CO2. Acquire an in-depth understanding of Smart cities concepts and critically analyze global best practices. CO3. Develop robust strategies to proactively address vulnerabilities in urban settings. CO4. Explore the impactful roles of cutting-edge technologies, including Big Data, artificial intelligence, and robotics, in resolving urban and sustainability challenges. CO5. Apply knowledge of emerging technologies to devise solutions for real-world urban issues. CO6. Foster a forward-thinking mindset by seamlessly integrating theoretical insights with practical applications, aiming to

		shape sustainable and technologically advanced urban environments.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I – Cities & Growth Pattern	**25%**
Introduction to cities and different types of cities; city mobility; urban economy and city growth drivers; governance; Livability; Urban design and spatial form; City Planning models; Neighborhood models; Urban patterns, International Best practices. Creative financing models for developing future cities	
Module II – Smart & Sustainable cities	**25%**
International smart city- concepts and definitions, Contemporary features; Challenges and drivers of Smart City Development; Significance of smart cities from International business perspectives; Global frameworks of smart city innovation; Planning support systems -methods and tools; Global Models, scenarios and best practices; Cases of Hongkong smart city model, European smart cities project, Masdar city, Barcelona, Amsterdam, Birmingham, Seoul, Finland, Copenhagen, Rio de Janeiro, Kalundborg, Fujisawa, Songdo, Tel Aviv, Berlin, London, Prague. etc.	
Module III – City Resilience	**25%**
Defining Urban Resilience, Identifying the Risks to Resilience, The Resilience of City Systems: Interdependencies – Synergistic and Antagonistic – and How We Measure Them, Modelling Resilience: The Role of Geospatial Data, Resilience and the Advantages of a System of Systems Approach, Community Resilience Assessments for Localized Mitigation Planning and Visualization , Case studies: London: The Resilient City, Case Study: Jakarta, Indonesia	
Module IV – Technology applications for future cities	**25%**
Responsive Technologies – Systems enable powerful new applications that improve the life of each resident in areas of health, energy conservation, mobility, and communications, Data-driven, evidence-based decision support systems that enable expert and non-expert stakeholders to participate in complex urban design and infrastructure decision making, New Mobility Systems: Shared-use and autonomous alternatives to the private automobiles that can allow an increase in the vibrancy and density of the city without problems created by congestion and parking demand	

Pedagogy for Course Delivery	:	• Lecture • Tutorial exercises

		• Learning by doing / workshops • Learning by experience/site visits • Learning by expert interactions • Learning by secondary data • Class presentations / group discussions • Attending seminars/conferences

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Text & References:

1. Balchin, P. et.al. (2000). *Urban economics – A global perspective.* Palgrave, New York
2. Birdie, G.S., and Birdie, J.S. (2002). *Water supply and sanitary engineering*. Dhanpat Rai Publishers, Delhi.

3. Catanese, et.al. (1979). *Introduction to urban planning.* McGraw-Hill, New York.
4. Chandrappa, R., Das, D. (2012). *Solid waste management- Principles and practice.* Springer Verlag, Berlin.
5. El-Khoury, R. & Robbins, E., Shaping the City: Studies in History, Theory and Urban Design, Edn. 2, Routledge, 2013
6. Evans, J., Karvonen, A. & Raven, R., The Experimental City, Routledge, 2016
7. Gallion, A. (1984). *The urban pattern – City planning and design*. CBS, New Delhi.
8. Geertman, S., Ferreira, J., Goodspeed, R. & Stillwell, J., Planning Support Systems and Smart Cities, Springer, 2015
9. Hua, G. B., Smart Cities as a Solution for Reducing Urban Waste and Pollution, IGI Global, 2016
10. Jha, R., Chandiramani, J. (2012). *Perspectives in urban development- Issues in infrastructure, planning and governance.* Capital Publishing, New Delhi.
11. Kalra, P., Shekhar, R. (2006). *Urban energy management*. India Infrastructure Report, Oxford University Press, New Delhi.
12. Keirstead, J., Shah, N. (2013). *Urban energy systems- An integrated approach*. Oxford University Press, New Delhi.
13. Kulshrestha, S. (2012). *Urban and regional planning in India- A handbook for professional practice.* Sage, New Delhi.
14. Levy, J. (2002). *Contemporary urban planning*. Prentice-Hall, New York.
15. Lim, C. J.; Liu, Ed., Smartcities + Eco-warriors, Routledge, 2010
16. Marshall. S. (2011). *Urban coding and planning.* Routledge, Oxon.
17. Murph, W.R. and McKay, G. (1986). *Energy management*. Elsevier Printing, New Delhi.
18. Newman, P. & Thornley, A., Planning World Cities: Globalization and Urban Politics, Edn. 2, Palgrave Macmillan, 2011
19. Sarkar, A. N., Smart Cities: A Symbiosis of Heritage, Aesthetics, Architecture, Economy, Environment and Modern Lifestyle, SSDN Publishers, 2016
20. Sasikumar, K., Gopikrishna, K. (2009). *Solid waste management.* Prentice-Hall of India, New Delhi.
21. Timmerhans, H. (1997). *Decision support systems in urban planning.* Spon Press, London.

Any Other Study Material:

1. Class lecture notes/ presentations.

Digital Technologies and Social Media Marketing

Course Title	:	Digital Technologies & Social Media Marketing
Course Code	:	AUMCM794
Credit Unites	:	5

L	**T**	**P**	**SW**	**FW**	**Total Credits**
2	2	0	2	0	5

Course Objective	:	• To understand the concept of Digital Technologies and Marketing • Understanding the importance of Social Media • Learning about different Social Media Platforms • Understand importance of Websites • Learning to build Websites • Learning how to use Social Media Platforms for Brand Building & Marketing • Understanding the new trends in Digital Marketing

Pre-requisites	:	Graduate Students having interest in marketing & selling with good working knowledge of Computers & understanding the basic idea of the social media platforms.

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	Upon successful completion of the course, students will be able to:
		CO1. Demonstrate broad knowledge of the concepts and approaches of digital marketing and its implementation in the built environment. CO2. Explain the importance of digital media and social media platforms in real estate and urban infrastructure sectors. CO3. Apply digital media tools to create awareness and support selling strategies in real estate. CO4. Build and implement strategies for digital marketing campaigns and practice social media marketing techniques. CO5. Analyze the effectiveness of digital marketing strategies in improving business visibility and customer engagement. CO6. Examine emerging trends and evaluate the integration of artificial intelligence in digital marketing technologies.

Course Content / Syllabus:

Modules	**Weightage (%)**
Module I - Introduction to Digital Technology	**20%**
Basic concept of Digital Technology & Media, Online Marketing Process and Framework, Objectives of Digital Marketing, Tools of Digital Marketing, Redefining Customer Engagement, Website Creation, Organic and Inorganic listings, Search Engine Optimization.	
Module II - Conversion Optimization	**20%**
Lead Generation for the Built Environment, Remarketing, Google Adwords, Google Adsense, Google Analytics	
Module III - Digital Marketing	**15%**
Omnichannel Strategies in Real Estate, Direct Mail Marketing / Email Persuasion / Personalized Emails, Mobile Marketing, Video Marketing, Webinars – Related to Policy Frameworks and Market Analysis / Opportunities, Blogging / Customer, Conversations	
Module IV - Social Media Marketing	**25%**

Modules	**Weightage (%)**
Introduction to Social Media, Power of Social Media in the Built Environment, Power of going Viral, Facebook Page & Facebook Ad, Linked In Page & Linked In Ad, Twitter a/c & Twitter Ad, Instagram, Social Messaging Apps – Whatsapp / Facebook Messenger / WeChat	
Module V – New Trends in Digital Marketing	**20%**
Virtual Reality (VR) in real estate, Interactive Chatbots, Voice Search – SIRI, etc. Visual Search, Artificial Intelligence (AI) powered content marketing, Integration of AI in the Digital Space, Basics of Blockchain Technology	

Pedagogy for Course Delivery	:	Classroom Lectures, Practical & Hands on Implementation & Experience, Industry interaction, Self work, Assignment.

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	**Lab / Practical / Studio (%)**
100	0

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0

Assessment	15
Total Hours	**150**

Text & References:

1. Marketing 4.0: Moving from Traditional to Digital – Philip Kotler, Hermawan Kartajaya, Iwan Setiawan
2. The Art of Digital Marketing: The Definitive Guide to Creating Strategic, Targeted, and Measurable… by Ian Dodson
3. Social Media Marketing when you have NO CLUE!: Youtube, Instagram, Pinterest, Twitter, Facebook (Influencer Fast Track Series 5) Kindle Edition by Gundi Gabrielle
4. Social Media Marketing In A Week: Create Your Successful Social Media Strategy In Just Seven Days (Teach Yourself, In a Week) Paperback – 26 Apr 2013, by Nick Smith

Any Other Study Material:

1. Articles of interest available in public domain.

Advanced Finance Management

Course Title	:	Advanced Finance Management
Course Code	:	AUMREAL796
Credit Units	:	5

L	T	P	SW	FW	Total Credits
2	2	0	2	0	5

Course Objective	:	To familiarize students with advanced concepts in the area of corporate finance with special reference to corporate restructuring, mergers and acquisitions and derivatives market.

Pre-requisites	:	Basics of Financial Management and Accounting.

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	CO1. Critically analyze the issues surrounding mergers and acquisitions as a strategic option for organizations. CO2. Evaluate corporate restructuring issues and explain their implications for business performance. CO3. Select and apply appropriate valuation tools and techniques to assess the worth of a firm. CO4. Formulate hedging strategies using different derivative instruments to manage financial risks. CO5. Diagnose portfolio risk and propose effective mitigation measures. CO6. Identify opportunities for real options and analyze their impact on corporate value and investment decisions.

Course Content / Syllabus:

Modules	Weightage (%)
Module I – Introduction to Mergers and Acquisitions	**20%**
Introduction: Why Mergers and Acquisitions? Motivation for M&As: Synergy, Diversification, Strategic Realignment and other motivations. **Approach to M&As:** Deal Sourcing, Framework for Decision Making, Financial and Strategic Analysis, Target Company, Parenting Strategies, and Entering Foreign Markets through M&As.	
Module II – M&A Valuation	**30%**
Value Drivers and Target Valuation: Value Drivers, Economics of a Merger, Free cash Flow Valuation, Estimation of the Value of Synergy, Adjusted Present Value, Capital cash Flow Valuation. **Real Options Analysis in Mergers and Acquisitions:** Real Options in Corporate Finance, Timing Option, Growth Option, Abandonment and Other Options. **Design of Consideration in Acquisition:** Cash and Stock Offers, the Impact of Method of Payment on Performance. **Spin** – Offs, Equity Carve Outs and Targeted Stock: Forces Driving Restructuring Initiatives. Types of Restructuring, Asset Sales, and Long Run Performance of Spun Off Firms.	
Module III – Efficient Markets Hypothesis and Behavioural Finance	**20%**
The Efficient Markets Hypothesis and Behavioural Finance: Evolution of asset prices in an efficient market, Theoretical foundations and forms of EMH, Behavioural and empirical challenges to EMH, Some explanations for the EHM violations, and the lessons of market efficiency, Stock Price Behaviour & Market Efficiency, Behavioural Finance, and Bond Prices & Yields **Risk & Return:** Buying & Selling Securities, The Stock Market, Common Stock Valuation, Portfolio Diversification & Asset Allocation, Return, Risk, and the Security Market Line and Capital Market Line,	
Module IV – Hedging and Derivatives	**30%**

Modules	Weightage (%)
Introduction to Derivatives: History and Origin of derivative market in India, the classification of derivatives, Mechanics of derivative markets, the important features of derivatives, derivatives as a risk management tools (Hedging). **Futures market:** Meaning and operations, specifications of futures contracts, Contango and backwardation, convergence, margins, delivery, trading, TED spread, Determination of futures prices: of stock index futures, currency futures, commodity futures, cost of carry, delivery options. **Hedging strategies using futures:** Basis risk, why hedge, Hedge ratio, Index futures, Rolling the hedge forward. Interest rate futures: T. Bills & T. Note futures, T. Bond & Eurodollar futures, Duration, Hedging strategies. **Options Market:** The concept: American and European Options, Trading strategies, role of OCC, Pricing of Options: Put Call parity, Binomial Option Single period and two step binomials, pricing model & Black Scholes pricing model for stock options, Index options, Currency options & Options on futures,	

Pedagogy for Course Delivery	:	Learning outcomes include developing students' knowledge with respect to theoretical aspects and industry practice. Accordingly pedagogy for course delivery includes theoretical lectures supported by industry case studies. Student assignments would include individual and group submissions with focus on presentations. In conjugation with other subjects this course aims for the following competencies: Valuation of Merger and Acquisition, Synergy and Real Option. Capital Markets Derivatives and Hedging

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	Lab / Practical / Studio (%)
100%	0%

Theory Assessment:

Continuous Assessment / Internal Assessment			**End Term Examination**
Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	75
Field Work	0
Assessment	15
Total Hours	**150**

Textbooks & References:

1. Kumar, R (2010), Mergers and Acquisitions, Text and Cases, Tata McGraw Hill, New Delhi.
2. De Pamphilis, Donald (2008), Mergers, Acquisitions, and Other Restructuring Activities, New York: Elsevier, Academic Press 5E/ 6E.
3. Options, Futures and other derivatives by John C. Hull, 7th Edition, Pearson Education, (2009)
4. Fundamentals of Financial Derivatives by N R Parasuraman, 1st edition, Wiley India (2009)
5. Fundamentals of Corporate Finance, Jonathan Berk, Peter DeMarzo and Jarrad Harford, 2nd edition, Pearson Education.
6. Jonathan Berk and Peter DeMarzo, Corporate Finance with My Finance Lab, Global Edition, 2nd edition, Pearson Education, ISBN: 1-40-828333-6.

Entrepreneurship in Built Environment

Course Title	:	Entrepreneurship in Built Environment
Course Code	:	AUMREAL791
Credit Units	:	5

L	T	P	SW	FW	Total Credits
2	**2**	**0**	**2**	**0**	**5**

Course Objective	:	The course aims to develop an attitude, mind set and skills that are crucial for becoming a creative business person. These skills and mind set are applicable both in the context of becoming a successful entrepreneur by starting a new firm as well as an intrapreneur-with SBU responsibility in pre-established company.

Pre-requisites	:	None

Student Learning Outcomes (SLO) /Course Outcome (CO)	:	CO1. Identify the significance of entrepreneurship in the current economic scenario, particularly in the built environment sector. CO2. Appreciate entrepreneurial attributes and analyze challenges commonly faced by entrepreneurs in the built environment. CO3. Examine business opportunities using criteria applied by successful entrepreneurs and venture capital investors. CO4. Outline and apply various methods for generating innovative business ideas. CO5. Identify and evaluate key parameters that contribute to the development of a viable business plan. CO6. Develop and deliver persuasive sales pitches and defend entrepreneurial ideas with logical reasoning before potential investors.

Course Content / Syllabus:

Modules	Weightage (%)
Module I - Entrepreneurship as a Concept – Idea Generation	
The module tends to examine the concept of entrepreneurship as a process. The overview of types of start-up ventures and the role of entrepreneurship in economic development of the country would be highlighted. Different entrepreneurial attributes along with challenges faced by entrepreneurs would be discussed. Importance and role of corporate entrepreneurship would also be outlined, especially in the Built Environment. Discussion: Methods for Generating Idea. What is a good business opportunity and where does it come from? How to value the ideas that have no market as yet? What is the difference between an idea and a business opportunity? How to examine the opportunities with respect to a business via a zoom lens on the criteria used by successful entrepreneurs, ventures capital investors in evaluating potential ventures.	**20%**
Module II – Forms of Business, Stages of Creating a Venture and Raising Finance	
Forms of Business Organizations and Legal Implications: Understand the implication of law on the various forms of organization affecting the decisions of the entrepreneur. Which form of the Organisation decision is driven chiefly by the legal objectives of the entrepreneur and the firm's investors, in terms of tax status, exposure to legal liabilities and flexibility in the operation and financing of the business. The module focusses on the various alternative forms of organization, the advantages and the disadvantages of each from Built Environment Perspective. Raising Capital for the Venture: Identify various sources of funding available and the implication of such methods of raising capital. Introduction of the concept of Boot Strapping, Moon Lighting, Seed Funding, Angel Investors, Venture Capitalists, Incubators and Accelerators	**20%**
Module III - Business Plan, Building Team, Crafting Strategy	
Writing a Business Plan: The scope and value of business plan within the new venture creation. Strategic Goals, Products and Services and their Competitive Advantages, Marketing Plan, Financing, Long Term Plan and Scalability of the business model. Building Team: Role and significance of teams in building new ventures - thereby exploring the critical issues and hurdles, including common pitfalls, faced by entrepreneurs in forming and building new venture. Crafting Strategy: Various strategies used by entrepreneurs that led to their successful business ventures, taking examples from Built Environment set-up. The critical elements like time bound decisions, reading the market pulse,	**40%**

weeding out unpromising ideas are important in the winning of such strategies.	
Module IV - Harvesting the Venture: Growth and Exit Strategies	
Nurture and grow the business into a stable enterprise: Managing the New Venture, Strategic challenges faced by Innovators and Start-ups and New Venture Financing Options. Developing strategies to generate market interest, arrange funding and simultaneously managing organizational operations, transitions and growth. Legal Issues and Managing Risk for Entrepreneurs: Relevance of a variety of laws to managers and entrepreneurs, including intellectual property, securities regulation, taxes, contracts, employment, business organization, product liability, environment, and alternative dispute resolution. Discuss Strategies not only for ensuring compliance with the law but also for using the law and the legal system to increase predictability, maximize value, manage resources, and manage risk. Importance of Sustainable practices; Discuss various Exit options for Founders and Investors	**20%**

Pedagogy for Course Delivery	:	Learning outcomes include developing an attitude, mind-set and skills that are crucial for becoming a creative business person. These skills and mind set are applicable both in the context of starting a new firm as well as starting a new business in a large, established company. Accordingly, pedagogy for course delivery includes theoretical lectures supported by industry case studies, guest presentations from leading entrepreneurs in Built Environment Sector. Student assignments would include individual and group submissions with focus on business plan presentations and/or following life of two entrepreneurs in Built Environment and comparing their paths and characteristics based on a framework of interview questions

Assessment / Examination Scheme:

Theory Lecture / Tutorial (%)	Lab / Practical / Studio (%)
100%	**0%**

Theory Assessment :

Continuous Assessment / Internal Assessment	End Term Examination

Components	**Project / Home Assignments/ Presentations / Role Play, etc.**	**Attendance**	50%
Weightage (%)	45%	5%	

Lab / Practical / Studio Assessment: NA

Notional Hours:

Lecture Contact	30
Tutorial Contact	30
Self-Work	60
Field Work	-
Assessment	30
Total Session	**150**

Text & References:

- Timmons, J.A. and Spinelli, New Venture Creation: Entrepreneurship for 21st Century, Tata McGraw-Hill
- David H. Holt, Entrepreneurship: New Venture Creation, Prentice-Hall India
- Bessant, J. and Tidd, J. (2011), *Innovation and Entrepreneurship*, (2nd Ed.), John Wiley and Sons Ltd.
- Drucker, P. F. (2007), *Innovation and Entrepreneurship,* Taylor and Francis

Any Other Study Material:

- Relevant reading material will be uploaded on LMS
- Copy of presentation slides of lectures