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Growing Capacity in Assam

Subject Design for new
Master of Construction
Management course



Assam Engineering College

Guwahati, Assam, India





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Academic Visitor's Report

Curriculum Development Programme for New Construction Management Course at Assam Engineering College

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MASTER OF CONSTRUCTION MANAGEMENT
ASSAM ENGINEERING COLLEGE
GUWAHATI-781013

PROJECT ECONOMICS AND FINANCE

(SUBJECT GUIDE)

(Version-1.0)
Developed by –Dr.Sudip Kumar Deb



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1.0 INTRODUCTION

Project Economics and Finance will be readymade package of information and tools to do financial appraisal and optimise decision making. It imparts basic knowledge and competencies required in project appraisal and financial management applicable to all sectors of industry and business. The subject mainly covers Fundamentals of Project Economics and Financial Techniques relevant under the proposed construction management course. The readers and students will be introduced with the development of Project Alternatives and Application of the Analysis Techniques like life cycle costing, sensitivity analysis, risk analysis and management; project funding and selection; project appraisal report.

2.0 OVERVIEW & OBJECTIVES OF THE SUBJECT

This subject develops fundamental knowledge in Construction Economic and Finance such as comparing alternatives proposals, evaluating alternative investments, management of funds, and management of accounting. Further, it will impart the technical modelling and evaluation of projects' feasibility, procurement strategies and outcomes, both in the public and the private sector. Topics covered include: capital formation; role of interest rates; assessing financial feasibility and the investment decision; project financing and financing instruments; technological strategies; profitability; socio-economic impact of projects; cost-benefit analysis; fitness for purpose; and revision of forecasts and financial decisions during project implementation. Students are required to apply this knowledge to real-life case projects to develop appropriate models for the analysis and evaluation of how the work meets objectives and expectations of the parties involved.

3.0 LEARNING OUTCOMES

This subject will develop the following program learning outcomes.

On successful completion, students should be able to:

- To develop skills in project modelling and evaluation, making investment decisions and assessing project impacts and benefits against costs.



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- To understand the financial, economic and other technical aspects of project evaluation.
- To develop analytical and problem-solving skills in relation to such aspects.
- To evaluate project feasibility and success.
- To facilitate decision-making on project investments.

4.0 GENERIC SKILLS

On completion of the subject students should have developed the following skills and capabilities:

- Ability to appreciate the scope and dimensions of professional roles.
- Ability to function effectively as either a team leader or member within multi-disciplinary and multi-cultural teams.
- Ability to communicate ideas, concepts and solutions to both technical and non-technical audiences effectively, clearly and concisely.
- Ability to handle several tools that helps to formulate innovative hybrid tool for the project planner and manager.
- Ability to carry out research and apply fundamental theoretical knowledge to problem solving in relevant disciplines.

5.0 DETAILED SUBJECT SCHEDULE

Total contact period: 45 hours
Duration of Lecture: 1 Hour
Duration of Tutorial: 1hours

Table 1: Detailed subject schedule

Week No.	Lecture	Topic	Learning Activities
1	Lecture 1:	Relevance of Economics and Finance in project development. • Scope and importance • Evolutionary Trends in Construction project	Reading list: PEF-L1-2.1 PEF-L1-2.2 PEF-L1-2.3 (Essential) PEF-L1-2.4



Week No.	Lecture	Topic	Learning Activities
	Lecture 2:	Project economy basic components • Time value of money • Capital cost • Maintenance cost	PEF-L1-2.5 (Optional)
	Tutorial 1:	Worked Examples and Reflections (Lecture 1 & 2)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 1 & 2.
2	Lecture 3:	Project financial techniques and evaluation	Reading list: PEF-L3-4.1 PEF-L3-4.2 PEF-L3-4.3 PEF-L3-4.4
	Lecture 4:	• NPV • IRR	
	Tutorial 2:	Worked Examples and Reflections (Lecture 3& 4)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 3 & 4.
3	Lecture 5:	• . Valuation & depreciation	Reading list: PEF-L5-6.1 PEF-L5-6.2
	Lecture 6:	• Replacement studies	Reading list: PEF-L5-6.3 PEF-L5-6.4
	Tutorial 3:	Worked Examples and Reflections (Lecture 5& 6)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 5 & 6.
4	Lecture 7:	Estimating Cost of Project Project specifications Estimating Fixed Capital Investment in Project	Reading list: PEF-L7-8.1 PEF-L7-8.2 PEF-L7-8.3 PEF-L7-8.4



Week No.	Lecture	Topic	Learning Activities
	Lecture 8:	Funding agency Debt Venture capital Equity Bond and debenture	PEF-L7-8.5 PEF-L7-8.6
	Tutorial 4:	Worked Examples and Reflections (Lecture 7& 8)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 7& 8.
5	Lecture 9:	Project Life cycle management	Reading list: PEF-L9-10.1 PEF-L9-10.2 PEF-L9-10.3 PEF-L9-10.4 (Essential) PEF-L9-10.5 (Optional)
	Lecture 10:	Life cycle cost analysis	
	Tutorial 5:	Worked Examples and Reflections (Lecture 9& 10)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 9 & 10.
6	Lecture 11:	Development of project alternatives	Reading list: PEF-L11-12.1 PEF-L11-12.2 (Optional) PEF-L11-12.3
	Lecture 12:	- Project analysis - Appraisal tool	Reading list: PEF-L11-12.4 PEF-L11-12.5 (Essential) PEF-L11-12.6 (Optional)
	Tutorial 6:	Worked Examples and Reflections (Lecture 11& 12)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 11& 12.
7	Lecture 13:	Risk analysis and economic estimation	Reading list: PEF-L13-14.1 PEF-L13-14.2 (Optional)



Week No.	Lecture	Topic	Learning Activities
	Lecture 14:	Mitigation and structure	Reading list: PEF-L13-14.3 PEF-L13-14.4 (Essential) PEF-L13-14.5 (Optional)
	Tutorial 7:	Worked Examples and Reflections (Lecture 13& 14)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 13 & 14.
8	Lecture 15:	- Sensitivity analysis - Impact on market condition - Inflation/deflation	Reading list: PEF-L15-16.1 PEF-L15-16.2 (Essential)
	Lecture 16:	- Investment rate change - Foreign exchange	Reading list: PEF-L15-16.3 PEF-L15-16.4 (Essential)
	Tutorial 8:	Worked Examples and Reflections (Lecture 15& 16)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 15 & 16.
	Assignment 1:	Analysis of Building Materials used in a Building (Draft Report to be Submitted)	
9	Lecture 17:	Method of qualitative risk management	Reading list: PEF-L17-18.1 (Optional) PEF-L17-18.2 PEF-L17-18.3
	Lecture 18:	Decision tree Utility theory Monte Carlo simulation	Reading list: PEF-L17-18.4 PEF-L17-18.5 PEF-L17-18.6 (Essential)
	Tutorial 9:	Worked Examples and Reflections (Lecture 17& 18)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 17 & 18.



Week No.	Lecture	Topic	Learning Activities
10	Lecture 19:	- Evolution of project finance - Project Types	Reading list: PEF-L19-20.1 PEF-L19-20.2 (Essential)
	Lecture 20:	Project feasibility - Criteria - Economic feasibility	Reading list: PEF-L19-20.3 PEF-L19-20.4 PEF-L19-20.5 (Essential)
	Tutorial 10:	Worked Examples and Reflections (Lecture 19& 20)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 19 & 20.
11	Lecture 21:	Investment criteria and methodologies Multi stage multi criteria	Reading list: PEF-L21-22.1 PEF-L21-22.2 PEF-L21-22.3 (Essential)
	Lecture 22:	Measurers used by Lenders Measures used by public investors	PEF-L21-22.4 PEF-L21-22.5 PEF-L21-22.6
	Tutorial 11:	Worked Examples and Reflections (Lecture 21& 22)	Discussions/quiz etc. based on the Essential Readings of Lecture 21 & 22.
12	Lecture 23:	- Loan documentation - Debt service	Reading list: PEF-L23-24.1 PEF-L23-24.2 PEF-L23-24.3
	Lecture 24:	Short term project finance Long term project finance Non Banking Finance Institutions	PEF-L23-24.4 PEF-L23-24.5 PEF-L23-24.6
	Tutorial 12:	Worked Examples and Reflections (Lecture 23& 24)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 23 & 24.



Week No.	Lecture	Topic	Learning Activities
	Assignment 2:	Analysis of Building Materials used in a Building (Draft Report to be Submitted after peer review.)	
13	Lecture 25:	Cash flow schedule - Linear schedule analysis - Optimization	Reading list: PEF-L25-25.1 PEF-L25-26.2 PEF-L25-26.3 PEF-L25-26.4
	Lecture 26	- Contracts and payment schedule - Constrained project schedule	
	Tutorial 13:	Worked Examples and Reflections (Lecture 25 & 26)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 25 & 26.
14	Lecture 27	Economic growth and development economics Taxation policy	Reading list: PEF-L28-29.1 PEF-L28-29.2 PEF-L28-29.3 PEF-L28-29.4 PEF-L27-28.5 PEF-L27-28.6
	Lecture 28:	Incentives Policy	
	Tutorial 14:	Worked Examples and Reflections (Lecture 27 & 28)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 27 & 28.
	Assignment 3:	Analysis of Building Materials used in a Building (Final Report to be submitted)	
15	Lecture 29:	Construction project delay Analysis of causes	Reading list: PEF-L29-30.1 PEF-L29-30.2 PEF-L29-30.3 PEF-L29-30.4 PEF-L29-30.5 PEF-L29-30.6
	Lecture 30:	Delay in planning & design Cost overrun	
	Tutorial 15:	Worked Examples and Reflections (Lecture 29 & 30)	Discussions / quiz etc. based on the contents of Readings materials of Lecture 29 & 30.



Week No.	Lecture	Topic	Learning Activities
16	Group Discussions	Date and Topics TBA later	
	Final Presentation	Date and Topics TBA later	

6.0 PEDAGOGICAL APPROACH, ACTIVITIES

The pedagogical approach is based on classroom lectures of up to 1 hour duration twice a week during the course. The lectures will involve a range of teaching topics, which will include theoretical background on basic engineering materials. The teaching modes apart from classroom lectures will include group various activities such as, group tasks, site visits, preparation of case studies, evaluation of existing engineering materials in terms of their performance, and guest presentations from industry professionals on specific topics to provide both specialist knowledge and state of the practice to give an insight to real world issues. Seminars will be held every week so that each student can share their knowledge, ask questions and dive further in to the subject materials.

The timings of the scheduled activities will be provided at the beginning of the course, depending on the annual academic calendar of the college.

7.0 ASSESSMENT

Assessment in this subject has both formative and summative aspects to it. The students will have an opportunity to provide formative feedback to their peers and receive constructive feedback in return, as well as from the subject coordinator. This will give them the opportunity to develop and improve on particular skills throughout the course of the subject.

There are five assessment tasks in this subject. The assessment tasks (class participation, assignment 1 to 3 and final presentation) mimic the activities that a student is most likely to undertake in a real situation. This task will be used to demonstrate that the student has developed the skills needed to understand the behaviour of appropriate type of material.

The students' main tasks will be to identify appropriate type of material, study different characteristics and present their findings in a professional report and an oral presentation. A summary of the marking scheme is provided in Table 2. Specific requirements for each task are provided in section 7.1 and 7.2.

7.1 Class participation

The subject involves a range of activities and participation of the student is critical for achieving the learning outcome of the subject. The assessment for this task will involve a number of in-class discussion and quizzes relating to content covered during tutorials. The students will be assessed on their ability to



- Understand and interpret themes discussed during seminars
- Respond appropriately to questions.

7.2 Assignment

7.2.1 Analysis of existing Budget preparation and its improvement in line with Public Finance Management (PFM) life cycle

As a part of R & D or task monitoring team investigating different budget preparation under detailed project report for infrastructure development in Government Technical Institutions, the student will be asked to undertake an analysis of different types of documentation process, different procedure and financial tools-techniques used during budget preparation in a systematic manner in order to ascertain the effectiveness and quality of its authorization and implementation under project life cycle consideration. This will include

- Identification of different types of DPR prepared during last five years.
- Carry out critical examination of budget estimation of these projects.
- Examining the different financial methods adopted and listing their merits & demerits.
- Critically analyse the performance of budget estimation under project life cycle.
- Review and revise the existing methodologies in line with PFM life cycle as depicted in PFMS portal.

The analysis of the current study as well as the recommendations with explanations will have to be submitted to the Co-ordinator of the course with a copy to DTE, Govt. Of Assam/Principal, AEC in the form of a report.

The exact structure of the report is up to the student, but the student should attempt to address the above mentioned areas in his/her report.

Report format

The report should be presented in A4 format with margins of 2.50m in each side and the pages numbered. The line spacing should be 1.50 cm. Both sides of the page should be utilized for printing.

Heading, tables, diagrams are to be used and appropriately numbered. An abstract or executive summary at the beginning of the report is to be included (which will include key findings and recommendations). There is no page limit as such for the report, but it should be approximately 5000 words in length (excluding tables, diagrams and references)

Use of references to existing research/literature in order to support the argument of the report is to be included and properly referenced. The Harvard referencing format (i.e. Author (year)) should be used to cite specific references and all the references should be referred to in a 'References' section at the end of the report.

As the student will be presenting the report and its major findings to the GMC (subject coordinator and invited panel members) during the last week of the



semester, the report should be written in a style and format that reflects its intended purpose, considering that the report is being drafted by a member of GMC.

The students are advised to refer to online skill development courses provided by www.coursera.org to get a better idea of how to put their ideas to words. The following links may be useful for the students

<https://www.coursera.org/learn/business-writing>

<https://www.coursera.org/specializations/academic-english>

Submission – Draft Report

The students are required to submit a draft of their report in week 8. The draft report should, as a minimum be structured and formatted as it is planned to present the final report. It should include all the items as mentioned in clause 7.2.1

The Draft Report should not provide any identifying details (name, enrolment number etc) that could be used to identify the student, as the peer review process will be anonymous. Submit your draft report in print form with proper spiral bind.

7.2.2 Peer Review

Students are required to critically review one of their colleagues' draft reports and provide constructive feedback on how they might be improved. The review should be approximately between 500-1000 words. Primary focus should be on the strengths and weakness of the peer's draft report and how well they address the requirement of the task across the following criteria.

- Abstract / Executive summary
- Table of contents provided
- Ability to map the existing types of building materials and their properties.
- Use of diagrams/description to effectively illustrate the problem at hand.
- Indication of potential areas for improvement by using alternative materials in the line of typology, weather, location, vulnerability towards natural disaster etc.
- Indication of potential areas for improvement in the form of energy efficiency, carbon footprint and sustainability issues.
- Suggested solutions.
- Presented in a concise, professional and well-structured manner.
- Integration of references to relevant literature.

The peer review should focus on making suggestions to help the peer further develop and improve their report.

Peer review assessment criteria

The student will be assessed in his ability to:

- Demonstrate a complete understanding on the subject matter.
- Apply that understanding to the analysis and critique of the peer's draft report.
- Critically evaluate the work of peer's and provide constructive feedback.



- To use skill and sensitivity in providing formative (constructive) feedback to peers.

The peer feedback of a draft report of a student will be provided to the student after the completion of the process i.e. by Week 12.

7.2.3 Submission – Final Report

The final report should be submitted in printed form after considering and incorporating the suggestions made in the peer review comments (if any). Reports submitted after the due date will incur a 10 % penalty of the available marks in that section, unless prior application for special consideration has been submitted and approved.

Final Report Assessment Criteria

The student will be assessed on their ability to

- Identify different types DPR/budget estimator used in the infrastructure development projects and mapping of their relative advantages.
- Use of diagrams/description to effectively illustrate the problem at hand.
- Indicate potential areas for improvement by using alternative financial and econometric tools & techniques in line with PFMS currently introduced by Government of India.
- Suggested solutions.
- Presented in a concise, professional and well-structured manner.
- Integration of references to relevant literature.

7.2.4 Final Presentation

The student will present the major findings from his/her final report to the panel members (co-ordinator and invited reviewers). The ideas that have been identified have to be presented.

Format

The presentation should be addressed to the panel members, the student is welcome to present in an own format, but it has to be remembered that the format maximises the exposure to the content of the presentation.

Presentation : 15 minutes followed by Q & A: 5 minutes

Assessment Criteria

The presentation will be assessed by the panel members on the way of presentation and communication skills. The student will be assessed on his/her ability to:

- Describe the use of different engineering materials.
- Describe the suggested changes in using materials.
- Convince the panel members of the need to change the practices and explain the rationale behind it.
- Communicate the findings of the evaluation of the present building.

Presentation date: Week 16.

Students are required to be available for the entire week. The time of presentation will be advised at a later date.

7.3 Marking Scheme (It is to be revised as per Indian University/Affiliated university regulation)

Table 2 provides the detailed marking scheme in this subject.



Table 2: Summary of Assessment Tasks and Marking scheme

Assessment category	Brief Discussion	Weight (%)	Pass (%)	To pass, a student has to	
				obtain a minimum marks of	Out of
Class participation	Participation in weekly activities and active involvement in class discussion	10	4	8	20
Assignment 1 (Draft)	See Below	10	4	8	20
Assignment 2 (Peer Review)	Review of peer report (1000 words)	10	4	8	20
Assignment 3 (Final)	Professional report outlining as assessment of building materials and suggestions for improvement. (5000 words)	10	4	8	20
Final Presentation	Presentation of report findings and recommended improvements.	10	4	8	20
End semester exam	Theory based.	50	20	40	100
Total	--	100	40	80	200

The students will have to appear in an end semester examination (as per the guidelines of the University under which AEC is affiliated) which will be subjective in nature. A minimum mark of 40% (each assessment category) must be achieved in the examination in order to pass the subject. The assignments/ presentations can be re-submitted in a semester if a student fails to score the requisite pass marks. However, if a student fails to achieve 40 % marks in the theory exam he will be deemed to fail in the subject and will have to clear in the next attempt.

8.0 REQUIRED READING



Students are expected to refer to various building operations and services related topics from various sources, which might include case studies, conferences papers, library collections, eBooks and eJournals. A list of essential and optional reading is provided in Table – 3, Clause 13.

9.0 REQUIRED TEXTS

1. M. A. Mian, Project Economics and Decision Analysis, Volume-I, Pennwell Corporation, 2002.
2. M. A. Mian, Project Economics and Decision Analysis, Volume-II, Pennwell Corporation, 2002.
3. David L. Whitman, Ronald E. Terry, Fundamental of Engineering Economics and Decision Analysis, Morgan and Claypool, USA, 2002.
4. Peter Attrill, Financial Management for Decision Makers, Pearson, New York, 2014.
5. Clive Wilson, Introduction to Financial Management, Prentice Hall of Australia, 1987.

REFERENCE BOOKS

1. John D. Finnerty, Project Financing: Asset based Financial Engineering, John Willey & Sons, 2007.
2. Burtonshaw Gunn, A Simon, Risk and Financial Management in Construction, Farnham, Burlington, VT, Gower, 2009.
3. Lawrence D. Schall, Charles W. Haley, Introduction to Financial Management, Mc Graw Hill, New York, 1991.

10.0 ATTENDANCE POLICY

The attendance policy is as per the standard university guidelines (under which AEC is affiliated).

11.0 PLAGIARISM, COLLUSION AND CONSEQUENCES

Merriam-Webster's online dictionary explains that **Plagiarism** is the act of stealing and passing off (the ideas or words of another) as one's own; or using



another's production without crediting the source; or to commit literary theft i.e. to present as new and original an idea or product derived from an existing source.

Collusion is the presentation by a student of an assignment as his or her own which is in fact the result in whole or part of unauthorised collaboration with another person or persons.

In any case where a student has been involved in plagiarism or collusion in an assessable assignment on task the marks awarded for that will be zero, and no substitution of an alternative task will normally be permitted.

12.0 Reading List

The reading list (as provided in Table 3) provides the literature that a student is expected to go through to understand the topics of the syllabus. However, this list is not an extensive one and may be updated and altered as and when necessary. Students are encouraged to come up with suggested literature in this field for discussion in or off the class.

Table 3: Reading List

Reading	Reference	Suggested Literature
PEF-L1-2.1	Lecture 1 & Lecture 2	Pedro Belli, Jock Anderson, Howard Barnum, John Dixon and Jee - Peng Tan, Handbook on economic analysis of investment operations, \ECONVAL\TECHAPP\TECHAPP2.DOC, 1997.
PEF-L1-2.2		Lyn Squire and Herman G. van der Tak, Economic Analysis of Projects, Published for the World Bank THE JOHNS HOPKINS UNIVERSITY PRESS Baltimore and London, 1975.
PEF-L1-2.3		Fred Moavenzadeh, Project Management Spring 2009, MIT OpenCourseWare http://ocw.mit.edu .
PEF-L1-2.4		Benjamin C. Esty, Why Study Large Projects? An Introduction to Research on Project Finance, European Financial Management, Vol. 10, No. 2, 2004.
PEF-L1-2.5		The time value of money, Source :: The core concepts in financial management, Chapter 5.
PEF-L3-4.1	Lecture 3 and Lecture 4	Franze E. Ross, Technical reviews and audit, keeping track of progress in development projects, Management Review, August, 1976.
PEF-L3-4.2		Bekhzod Yusupov and Azrai Abdullah, Recent Trends in Energy Project Financing in Emerging Markets, Global Business and Management Research: An International Journal Vol. 6, No. 4 (2014).



Reading	Reference	Suggested Literature
PEF-L3-4.3		Hussein A. Abdou and John Pointon, Credit scoring, statistical techniques and evaluation criteria: a review of the literature, Intelligent systems in accounting, Finance and management Intell. Sys. Acc. Fin. Mgmt. 18, 59, 2011.
PEF-L3-4.4		Tennent John, Guide to Financial Management. 2008, p145-178. 34p.
PEF-L5-6.1	Lecture 5 and Lecture 6	Joshua Krausz, Joel Hoohman, and Allen Sohiff, The Impact of Taxation on Project Valuation for Alternative Depreciation Methods, Accounting Horizons/September 1987.
PEF-L5-6.2		Kathy G, and Spietter ASA, Appraising Properties with Declining Utility, Journal of Property Tax Assessment & Administration • Volume 8, Issue 4, 2010.
PEF-L5-6.3		James C et al., Human resources accounting: measuring positional replacement costs, Human Resource Management, Spring, 1973.
PEF-L5-6.4		WENBO SHI and K. JO MIN. Product Remanufacturing and Replacement Decisions Under Operations and Maintenance Cost Uncertainties, The Engineering Economist, 59:154–174, 2014.
PEF-L7-8.1	Lecture 7 and Lecture 8	S.M. Abou Rizk, G.M. Babey, and G. Karumanasseri, Estimating the cost of capital projects: an empirical study of accuracy levels for municipal government projects, Canadian Journal Civil Engineering, 29: 653–661 (2002).
PEF-L7-8.2		Alfredo F. Serpell, Towards a knowledge-based assessment of conceptual cost estimates, BUILDING RESEARCH & INFORMATION (2004) 32(2), March–April, 157–164.
PEF-L7-8.3		Sayed Elkhoully et al., Application of a Decision Tree Model to a Business Case from Egypt, Competition Forum of American Society, Vol. 13 (2), 2015.
PEF-L7-8.4		Daniel ARMEANU, THE NPV CRITERION FOR VALUING INVESTMENTS UNDER UNCERTAINTY, Economic Computation and Economic Cybernetics Studies and Research, 2007.
PEF-L7-8.5		Paulo Rogério Faustino Matos, Alternative funding sources' impact on efficiency and productivity of subnational entities in Brazil after the Fiscal Responsibility Law, BRAZILIAN JOURNAL OF PUBLIC ADMINISTRATION Rio de Janeiro 51(4):482-508, July - Aug. 2017
PEF-L7-8.6		Chapter 5: The competitive market system for debt and equity funding, 2017 JOURNAL OF AUSTRALIAN TAXATION Vol 19 No 3.



Reading	Reference	Suggested Literature
PEF-L9-10.1	Lecture 9 and Lecture 10	Hassan Zalaghi et al., The Relationship between Life Cycle and Cost of Equity on the Firms Listed In Tehran Stock Exchange (TSE), International Journal of Management, Accounting and Economics Vol. 4, No. 6, June, 2017.
PEF-L9-10.2		Jan Vlachy, Using life cycle costing for product management, Management, Vol. 19, 2014,2, pp. 205-218.
PEF-L9-10.3		Ana MUNTEANU and Gabriela MEHEDINTU, THE IMPORTANCE OF FACILITY MANAGEMENT IN THE LIFE CYCLE COSTING CALCULATION, Review of General Management Volume 23, Issue 1, Year 2016.
PEF-L9-10.4		JohnV.Farra et al., Simulation-based costing for early phase life cycle cost analysis: Example application to an environmental remediation project, THE ENGINEERING ECONOMIST, Vol 21, 2016.
PEF-L9-10.5		Jason Westland, The Project Management Life Cycle, AEW Services, Vancouver, BC ©2007.
PEF-L11-12.1	Lecture 11 and Lecture 12	Peter O. Steineb, The role of alternative cost in project design and selection, Quarterly Journal of Economics, MIT press.
PEF-L11-12.2		Elizabeth L. Carter, Community planning, sharing law and the creation of intentional communities: promoting alternative economies and economic self-sufficiency among low-income communities, SOUTH WESTERN LAW REVIEW, Vol. 44, 2015.
PEF-L11-12.3		Abdul Ali et al., Selecting Product Development Projects: Pioneering versus Incremental Innovation Strategies, Management science/Vol. 39, No. 3, March 1993.
PEF-L11-12.4		BARRY G. SILVERMAN, Project appraisal methodology: a multidimensional R & D benefit/cost assessment tool, MANAGEMENT SCIENCE Vol. 27. No. 7. July 1981.
PEF-L11-12.5		Simone I. Flynn, Cost Benefit Analysis:Decision Making in the Public Sector, EBSCO Research Starters, 2014 EBSCO Information Services, Inc.
PEF-L11-12.6		Ferda Halicioglu, Estimation of economic discounting rate for practical project appraisal: the case of turkey, Journal of Developing Areas is the property of Tennessee State University, College of Business.
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PEF-L13-14.2	Lecture 13 and Lecture 14	Francois JOUBERT and Leon PRETORIUS, Using risk simulation to reduce the capital cost requirement for a programme of capital projects, Business, Management and education, 2017.
PEF-L13-14.3		K. C. Iyer and Mohammed Sagheer, Hierarchical Structuring of PPP Risks Using Interpretative Structural Modelling, JOURNAL OF CONSTRUCTION ENGINEERING AND MANAGEMENT © ASCE / FEBRUARY 2010.
PEF-L13-14.4		Linda Hancock, Brian Howe and Mark Considine, Transitional Labour Markets: a Social Investment and Risk Mitigation Strategy for Social Policy, Australian Bulletin of Labour, Vol32No2 2006.
PEF-L13-14.5		Harikrishna Narasimhan et al., A cost–benefit analysis of mitigation options for optimal management of risks posed by flow-like phenomena, Springer Science Business Media Dordrecht 2015.
PEF-L15-16.1	Lecture 15 and Lecture 16	Jordi van der Maas, Forecasting inflation using time-varying Bayesian model averaging, Statistica Neerlandica (2014) Vol. 68, nr. 3, pp. 149–182.
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PEF-L17-18.1	Lecture 17 and Lecture 18	KREMLJAK, Z, Qualitative analysis of project risk, Annals of DAAAM for 2011 & Proceedings of the 22nd International DAAAM Symposium, Volume 22, No. 1, ISSN 1726-9679.
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PEF-L17-18.3		Sharon K. Bodena et al., The risk management of childhood diabetes by primary school teachers, Health, Risk & Society Vol. 14, No. 6, September 2012, 551–564.
PEF-L17-18.4		Huybert Groenendaal and Francisco Zagmutt, Role and reality of Monte Carlo Simulation, Risk management magazine / August 2006.



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PEF-L17-18.5		Shimon Schocken et al., Refraining Decision Problems: A Graph-grammar Approach, Information Systems Research, Copyright © 1993. The Insiiutc of Managemem Sciences.
PEF-L17-18.6		Crispin Piney, Applying utility theory to risk management, Project management Journal, September 2003.
PEF-L19-20.1	Lecture 19 and Lecture 20	Claude Besner and Brian Hobbs, An Empirical Identification of Project Management Toolsets and a Comparison Among Project Types, October 2012 Project Management Journal.
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PEF-L19-20.5		Mark T. Chen, Simplified project economic evaluation, Cost Engineering, Vol 40, 1998.
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PEF-L23-24.2		Alınış Tarihi, Debt services and non-linear economic convergence in MENA countries, Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi, Cilt: 31 2017.
PEF-L23-24.3		Evan Schulman, More Debt Is Not the Answer, The Journal of Investing, Fall 2015.
PEF-L23-24.4		MARCO SORGE and BLAISE GADANECZ, The term structure of credit spreads in project finance, INTERNATIONAL JOURNAL OF FINANCE AND ECONOMICS Vol. 13: 68–81 (2008).
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PEF-L25-26.1	Lecture 25 and Lecture 26	Gunnar Lucko, Optimizing Cash Flows for Linear Schedules Modeled with Singularity Functions by Simulated Annealing, Journal of Construction Engineering and Management, ASCE, 2011.
PEF-L25-26.2		Pieter Leymana and Mario Vanhoucke, A new scheduling technique for the resource-constrained project scheduling problem with discounted cash flows, International Journal of Production Research, 2015 Vol. 53, No. 9, 2771–2786.
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PEF-L27-28.1	Lecture 27 and Lecture 28	Oleksandr Volodymyrovych Gurnak, Taxation and economic growth: an evolutionary approach, Economy of Industry, 66 ISSN 1562-109X 2014.
PEF-L27-28.2		Jean Andrei et al., The Impact and Determinants of Environmental Taxation on Economic Growth Communities in Romania, Energies 2016, 9, 902; doi:10.3390/en9110902. www.mdpi.com/journal/energies



Reading	Reference	Suggested Literature
PEF-L27-28.3		Michael Simkovic, The Knowledge Tax, The University of Chicago Law Review, 1982.
PEF-L27-28.4		GERALD W. SCULLY, Optimal taxation, economic growth and income inequality, Public Choice 115: 299–312, 2003. © 2003 Kluwer Academic Publishers. Printed in the Netherlands.
PEF-L27-28.5		Arbolino Roberta, The role of fiscal incentives for renewable energy on economic growth, International Journal of Business and Society, Vol. 18 No. 2, 2017, 387-396 .
PEF-L27-28.6		Paula Faria, How R&D and tax incentives influence economic growth: Econometric study for the period between 1995 and 2008 of EU-15, FEP working paper, Faculdade de Economia da Universidade Porto, 2011.
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PEF-L29-30.3		Aynur Kazaz et al., Causes of delays in construction projects in turkey, Journal of Civil Engineering and Management ISSN 1392-3730, 2012 volume 18(3).
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PEF-L29-30.6		Pablo González et al., Analysis of Causes of Delay and Time Performance in Construction Projects, Journal of Construction Engineering and Management, © ASCE, 2013.

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For any query please contact the subject coordinator over phone or email.

**The study materials for the entire subject have been
developed and will be available electronically.**



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MASTER OF CONSTRUCTION MANAGEMENT
ASSAM ENGINEERING COLLEGE
GUWAHATI-781013

PROJECT PROCUREMENT
(SUBJECT GUIDE)

(Version-1.0)
Developed by –Dr.Sudip Kumar Deb



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1.0 INTRODUCTION

Project management will at some points require project procurement, which involves the organization obtaining goods or services from third parties in order to complete a specific project. Procuring these goods or services provides several advantages over producing them inside the organization, helping to keep project costs down while still achieving the company's desired objectives. Thus, **Project procurement** is the creation of relationships with outside vendors and suppliers for goods and services needed to complete a project. This process is comprised of several steps and their systematic application in order to complete the project successfully. This document covers a brief study on some of the basic and frequently used procurement in order to meet their goals. Executing these procurements to fulfil the needs of the project falls under the knowledge area of Project Procurement Management. This subject guides the intended student and other readers to understand the basic objectives of this subject and how the students will be assessed during and after the completion of the course.

2.0 OVERVIEW & OBJECTIVES OF THE SUBJECT

The purpose of project procurement is to acquire the goods and services necessary to achieve the project scope. The purpose of the project procurement management plan is to define the methodology that will be used by the project to manage project procurement. The plan describes how the procurement processes will be managed from contract initiation through contract closure.

This subject will focus on the development of the related knowledge to understand and apply correct tools / techniques to procure materials commonly used in construction industry. The students and readers of the course will get first-hand knowledge on types of contracts available, requests for proposals, invitations to tender and selection etc within the processes of plan, conduct, control and close of procurement.

3.0 LEARNING OUTCOMES

This subject will develop the following program learning outcomes.



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On successful completion, students should be able to:

- Understand the core principles of project procurement.
- Develop and demonstrate hands-on expertise in project evaluation, procurement planning, and contract strategy.
- Practice effective techniques for successfully delivering projects.
- Develop knowledge on innovative and effective procurement model.
- Get basic knowledge on doing research for framing strategic and collaborative procurement model.

4.0 GENERIC SKILLS

On completion of the subject students should have developed the following skills and capabilities:

- Ability to identify various types of procurement policies having relative advantages to professional practice.
- Ability to communicate and demonstrate professionally with diverse project management stakeholders.
- Ability to select appropriate type, tool and technique to make optimal procurement of material.
- Ability to apply logical and creative thinking to formulate evidenced based solution of procurement problem.
- Ability to examine and reflect critically on the profession to improve existing policies or developing new policies of procurement.

5.0 DETAILED SUBJECT SCHEDULE

Total contact period: 45 hours
Duration of Lecture: 1 Hour
Duration of Tutorial: 1 hours

Table 1: Detailed subject schedule

Week No.	Lecture	Topic	Learning Activities
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Week No.	Lecture	Topic	Learning Activities
1	Lecture 1:	Introduction to Project Procurement • Meaning and Process • Scope and importance • Functions • Relation with other functions	Reading list: PP-L1-2.1 PP-L1-2.2 PP-L1-2.3 (Essential)
	Lecture 2:	• Traditional vrs new concept of procurement • New developments • Challenges ahead	PP-L1-2.4 PP-L1-2.5 PP-L1-2.6 (Optional)
	Tutorial 1:	Conceptual Examples and Reflections (Lecture 1 & 2) • Perspective of procurement in business	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 1 & 2.
2	Lecture 3:	Organization and structure • Types of organization • Location and nature • Construction organization	Reading list: PP-L3-4.1 PP-L3-4.2 PP-L3-4.3 PP-L3-4.4 PP-L3-4.5
	Lecture 4:	• Formalization • Centralization • Decentralization • Merits/demerits	
	Tutorial 2:	Worked Examples and Reflections (Lecture 3& 4)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 3& 4.
3	Lecture 5:	Internal collaboration • Need and Importance • Information sharing	Reading list: PP-L5-6.1 PP-L5-6.2 PP-L5-6.3 (Essential) PP-L5-6.4 PP-L5-6.5 PP-L5-6.6 (Optional)
	Lecture 6:	• Purchasing collaboration • Procurement planning	
	Tutorial 3:	Worked Examples and Reflections (Lecture 5& 6)	Discussions/quiz etc. based on the contents of Essential



Week No.	Lecture	Topic	Learning Activities
			Readings of Lecture 5& 6.
4	Lecture 7:	Sourcing strategy • Introduction • Out sourcing • In sourcing	Reading list: PP-L7-8.1 PP-L7-8.2 (Essential) PP-L7-8.3 PP-L7-8.4 (Optional)
	Lecture 8:	• Partnership sourcing • Global sourcing • Benefits and limitations.	
	Tutorial 4:	Worked Examples and Reflections (Lecture 7& 8)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 7& 8.
5	Lecture 9:	Portfolio models • Need and importance • The kraljic matrix	Reading list: PP-L9-10.1 PP-L9-10.2 PP-L9-10.3 PP-L9-10.4 (Essential) PP-L9-10.5 (Optional)
	Lecture 10:	• Supplier segmentation • Purchasing strategies • Models with relationships	
	Tutorial 5:	Worked Examples and Reflections (Lecture 9& 10)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 9& 10.
6	Lecture 11:	Social responsibility in procurement • Ethical purchase • Barriers and challenges	Reading list: PP-L11-12.1 PP-L11-12.2 PP-L11-12.3 (Essential) PP-L11-12-4 PP-L11-12.5 PP-L11-12.6 (Optional)
	Lecture 12:	Code of conduct • Recent trends • Benefits of ethical purchasing	
	Tutorial 6:	Worked Examples and Reflections (Lecture 11& 12)	Discussions/quiz etc. based on the contents of Essential



Week No.	Lecture	Topic	Learning Activities
			Readings of Lecture 11& 12.
7	Lecture 13:	Environment preferable procurement Green product	Reading list: PP-L13-14.1 (Essential) PP-L13-14.2 (Optional)
	Lecture 14:	- Global warming - Health and safety.	Reading list: PP-L13-14.3 PP-L13-14.4 (Essential) PP-L13-14.5 PP-L13-14.6 (Optional)
	Tutorial 7:	Worked Examples and Reflections (Lecture 13& 14)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 13 & 14.
8	Lecture 15:	Procurement Info-system - Demerits of traditional methods - ITC based Methods	Reading list: PP-L15-16.1 PP-L15-16.2 (Essential) PP-L15-16.3 PP-L15-16.4 PP-L15-16.5 (Optional)
	Lecture 16:	- EDI, - Internet etc	
	Tutorial 8:	Worked Examples and Reflections (Lecture 15& 16)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 15& 16.
	Assignment 1:	Critical Analysis and review of PFMS portal of India for effective procurement management. (Draft Report to be Submitted)	
9	Lecture 17:	IT driven procurement E-business	Reading list: PP-L17-18.1 PP-L17-18.2 PP-L17-18.3 (Essential) PP-L17-18.5 PP-L17-18.6 (optional)
	Lecture 18:	- E-auction - Reverse auction	



Week No.	Lecture	Topic	Learning Activities
	Tutorial 9:	Worked Examples and Reflections (Lecture 17& 18)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 17& 18.
10	Lecture 19:	Supplier and its selection • Screening process • Selection criteria • Conventional tools	Reading list: PP-L19-20.1 PP-L19-20.2 (Essential) PP-L19-20.3
	Lecture 20:	• Evaluation criteria • MCDM tools • AHP • Fuzzy linear model	Reading list: PP-L19-20.4 PP-L19-20.5 PP-L19-20.6 (Essential)
	Tutorial 10:	Worked Examples and Reflections (Lecture 19 & 20)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 19& 20.
11	Lecture 21:	Supplier selection using • ISO 9000 • ISO 14000	Reading list: PP-L21-22.1 PP-L21-22.2 (Essential)
	Lecture 22:	Global and local supplier • Key factors • Optimal selection • Ranking process	PP-L21-22.3 (Essential) PP-L21-22.4 PP-L21-22.5
	Tutorial 11:	Worked Examples and Reflections (Lecture 21& 22)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 21& 22.
12	Lecture 23:	• Researching supply market • Analysing supply market • Tool for analysing	Reading list PP-L23-24.1 PP-L23-24.2
	Lecture 24:	Supplier development • Tacit knowledge transfer • Activities network.	Reading list: PP-L23-24.3 PP-L23-24.4 PP-L23-24.5



Week No.	Lecture	Topic	Learning Activities
	Tutorial 12:	Worked Examples and Reflections (Lecture 23& 24)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 23& 24.
	Assignment 2:	Critical Analysis and review of PFMS portal of India for effective procurement management. (Draft Report to be Submitted after peer review.)	
13	Lecture 25:	Supplier quality development Different phases	Reading list: PP-L25-26.1 PP-L25-26.2
	Lecture 26	Contract administration	PP-L25-26.3
	Tutorial 13:	Worked Examples and Reflections (Lecture 25& 26)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 25& 26.
14	Lecture 27	Supplier buyer collaboration	Reading list: PP-L27-28.1 PP-L27-28.2
	Lecture 28:	Different types of collaboration and models	Reading list: PP-L27-24.3 PP-L27-28.4
	Tutorial 14:	Worked Examples and Reflections (Lecture 27& 28)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 27& 28.
	Assignment 3:	Critical Analysis and review of PFMS portal of India for effective procurement management. (Final Report to be submitted)	
15	Lecture 29:	- Procurement and supply chain management - Supply chain process	Reading list: PP-L29-30.1 PP-L29-30.2 PP-L29-30.3 PP-L29-30.4
	Lecture 30:	- Integrated supply management - Future concept of procurement	



Week No.	Lecture	Topic	Learning Activities
	Tutorial 15:	Worked Examples and Reflections (Lecture 29& 30)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 29& 30.
16	Group Discussions	Date and Topics TBA later	
	Final Presentations	Date and Topics TBA later	

6.0 PEDAGOGICAL APPROACH, ACTIVITIES

The pedagogical approach is based on classroom lectures of up to 1 hour duration twice a week during the course. The lectures will involve a range of teaching topics, which will include theoretical background on basic project procurement management principles. The teaching modes apart from classroom lectures will include group various activities such as, group tasks, site visits, preparation of case studies, evaluation of existing managerial practices in terms of their performance, and guest presentations from industry professionals on specific topics to provide both specialist knowledge and state of the practice to give an insight to real world issues. Seminars will be held every week so that each student can share their knowledge, ask questions and dive further in to the subject materials.

The timings of the scheduled activities will be provided at the beginning of the course, depending on the annual academic calendar of the college.

7.0 ASSESSMENT

Assessment in this subject has both formative and summative aspects to it. The students will have an opportunity to provide formative feedback to their peers and receive constructive feedback in return, as well as from the subject coordinator. This will give them the opportunity to develop and improved on particular skills throughout the course of the subject.

There are five assessment tasks in this subject. The assessment tasks (class participation, assignment 1 to 3 and final presentation) mimic the activities that a student is most likely to undertake in a real situation. This task will be used to demonstrate that the student have developed the skills needed to understand the behaviour of appropriate type of procurement methods and its usability.



The students' main tasks will be to identify appropriate type of system, study different features & characteristics and present their findings in a professional report and an oral presentation. A summary of the marking scheme is provided in Table 2. Specific requirements for each task are provided in section 7.1 and 7.2.

7.1 Class participation

The subject involves a range of activities and participation of the student is critical for achieving the learning outcome of the subject. The assessment for this task will involve a number of in-class discussion and quizzes relating to content covered during tutorials. The students will be assessed on their ability to

- Understand and interpret themes discussed during seminars
- Respond appropriately to questions.

7.2 Assignment

7.2.1 Analysis of Equipment Procurement policy in Government Engineering Colleges and its enhancement.

As a part of R & D or task monitoring team investigating different procurement of equipments and machineries completed in Government Engineering Colleges, the student will be asked to undertake an analysis of different types of procurements, different procedure and tools-techniques used during procurement in a systematic manner in order to ascertain the effectiveness and quality of procurement under project life cycle consideration. This will include

- Identification of different types of equipments procured during last three years.
- Carry out procurement similarity analysis and short listing the groups.
- Examining the yield point of procurement for each group.
- Critically analyse the procedure and tools adopted and scope of reduction yield point of procurement.
- Critical review of the used methodology and compare with modern e-procurement policy as depicted in PFMS portal.

The analysis of the current study as well as the recommendations with explanations will have to be submitted to the Co-ordinator of the course with a copy to Principal, AEC in the form of a report.

The exact structure of the report is up to the student, but the student should attempt to address the above mentioned areas in his/her report.

Report format

The report should be presented in A4 format with margins of 2.50m in each side and the pages numbered. The line spacing should be 1.50 cm. Both sides of the page should be utilized for printing.

Heading, tables, diagrams are to be used and appropriately numbered. An abstract or executive summary at the beginning of the report is to be included (which will include key findings and recommendations). There is no page limit as



such for the report, but it should be approximately 5000 words in length (excluding tables, diagrams and references)

Use of references to existing research/literature in order to support the argument of the report is to be included and properly referenced. The Harvard referencing format (i.e. Author (year)) should be used to cite specific references and all the references should be referred to in a 'References' section at the end of the report.

As the student will be presenting the report and its major findings to the Head of office administration (subject coordinator and invited panel members) during the last week of the semester, the report should be written in a style and format that reflects its intended purpose, considering that the report is being drafted by a responsible member of academic corporate.

The students are advised to refer to online skill development courses provided by www.coursera.org to get a better idea of how to put their ideas to words. The following links may be useful for the students

<https://www.coursera.org/learn/business-writing>

<https://www.coursera.org/specializations/academic-english>

Submission – Draft Report

The students are required to submit a draft of their report in week 8. The draft report should, as a minimum be structured and formatted as it is planned to present the final report. It should include all the items as mentioned in clause 7.2.1

The Draft Report should not provide any identifying details (name, enrolment number etc) that could be used to identify the student, as the peer review process will be anonymous. Submit your draft report in print form with proper spiral bind.

7.2.2 Peer Review

Students are required to critically review one of their colleagues' draft reports and provide constructive feedback on how they might be improved. The review should be approximately between 500-1000 words. Primary focus should be on the strengths and weakness of the peer's draft report and how well they address the requirement of the approach across the following criteria.

- Abstract / Executive summary
- Table of contents provided
- Ability to map the existing types of Equipments and their procurement policy.
- Use of diagrams/description to effectively illustrate the problem of delay.
- Indication of potential areas for improvement by using alternative procurement policies and tools.
- Indication of potential areas for improvement in the form of procurement efficiency and quality.
- Suggested solutions.
- Presented in a concise, professional and well-structured manner.
- Integration of references to relevant literature.



The peer review should focus on making suggestions to help the peer further develop and improve their report.

Peer review assessment criteria

The student will be assessed in his ability to:

- Demonstrate a complete understanding on the subject matter.
- Apply that understanding to the analysis and critique of the peer's draft report.
- Critically evaluate the work of peer's and provide constructive feedback.
- To use skill and sensitivity in providing formative (constructive) feedback to peers.

The peer feedback of a draft report of a student will be provided to the student after the completion of the process i.e. by Week 12.

7.2.3 Submission – Final Report

The final report should be submitted in printed form after considering and incorporating the suggestions made in the peer review comments (if any). Reports submitted after the due date will incur a 10 % penalty of the available marks in that section, unless prior application for special consideration has been submitted and approved.

Final Report Assessment Criteria

The student will be assessed on their ability to

- Identify different types Equipments/infrastructure required in Technical Educational Institution as well as industries and able mapping of their correct procurement methodologies.
- Use of diagrams/description to effectively illustrate the problem at hand.
- Indicate potential areas for improvement by using alternative methods in order to deduce risk in procurement.
- Indicate potential areas for improvement in the form of purchase efficiency.
- Suggested solutions.
- Presented in a concise, professional and well-structured manner.
- Integration of references to relevant literature.

7.2.4 Final Presentation

The student will present the major findings from his/her final report to the panel members (co-ordinator and invited reviewers). The ideas that have been identified have to be presented.

Format

The presentation should be addressed to the panel members, The student is welcome to present in an own format, but it has to be remembered that the format maximises the exposure to the content of the presentation.

Presentation : 15 minutes followed by Q & A: 5 minutes

Assessment Criteria

The presentation will be assessed by the panel members on the way of presentation and communication skills. The student will be assessed on his/her ability to:



- Describe the use of different engineering materials.
- Describe the suggested changes in using materials.
- Convince the panel members of the need to change the practices and explain the rationale behind it.
- Communicate the findings of the evaluation of the present building.

Presentation date: Week 16.

Students are required to be available for the entire week. The time of presentation will be advised at a later date.

7.3 Marking Scheme (It is to be revised as per Indian University/Affiliated university regulation)

Table 2 provides the detailed marking scheme in this subject.

Table 2: Summary of Assessment Tasks and Marking scheme

<i>Assessment category</i>	<i>Brief Discussion</i>	<i>Weight (%)</i>	<i>Pass (%)</i>	<i>To pass, a student has to</i>	
				<i>obtain a minimum marks of</i>	<i>Out of</i>
Class participation	Participation in weekly activities and active involvement in class discussion	10	4	8	20
Assignment 1 (Draft)	See Below	10	4	8	20
Assignment 2 (Peer Review)	Review of peer report (1000 words)	10	4	8	20
Assignment 3 (Final)	Professional report outlining as assessment of building materials and suggestions for improvement. (5000 words)	10	4	8	20
Final Presentation	Presentation of report findings and recommended improvements.	10	4	8	20
End semester exam	Theory based.	50	20	40	100
Total	--	100	40	80	200



The students will have to appear in an end semester examination (as per the guidelines of the University under which AEC is affiliated) which will be subjective in nature. A minimum mark of 40% (each assessment category) must be achieved in the examination in order to pass the subject. The assignments/ presentations can be re-submitted in a semester if a student fails to score the requisite pass marks. However, if a student fails to achieve 40 % marks in the theory exam he will be deemed to fail in the subject and will have to clear in the next attempt.

8.0 REQUIRED READING

Students are expected to refer to various building operations and services related topics from various sources, which might include case studies, conferences papers, library collections, eBooks and eJournals. A list of essential and optional reading is provided in Table – 3, Clause 13.

9.0 REQUIRED TEXTS

1. Peter Baily, David Farmer, Barry Crocker, David Jessop and David Jhones, Procurement principles and Management, Eleventh Edition, Prentice Hall, 2005.
2. Fred Sollish, Hohn Semanik, The Procurement and Supply manager's Desk, John Wiley & Sons, 2012.
3. Kenneth Lysons, Brian Farrington, Procurement and Supply Chain Management, Pearson, 2016.
4. P Baily, Purchasing principles and Management, Pearson Education, 2005.

REFERENCE BOOKS

1. Howard T. Lewis, Procurement: principles and Cases, Homewood, Richard D, Irwin, 1957.
2. Will Hughes et al., Procurement in Construction Industry: The Impact and Cost of Alternative Market and Process, Taylor and Francis, 2006.
3. Quentin W. Fleming, Project Procurement Management: Contracting and Sub-contracting, Teaming, Project Management Institute, 2016.



4. Lan Eglin, Procurement Management, First Edition, UK, 2013.
5. Anand Rajaram, Jeol Turkewitz and Nataliya, Procurement and Public Investment Management, <https://doi.org/10.1596/978-1-4648-0316-1>.

10.0 ATTENDANCE POLICY

The attendance policy is as per the standard university guidelines (under which AEC is affiliated).

11.0 PLAGIARISM, COLLUSION AND CONSEQUENCES

Merriam-Webster's online dictionary explains that **Plagiarism** is the act of stealing and passing off (the ideas or words of another) as one's own; or using another's production without crediting the source; or to commit literary theft i.e. to present as new and original an idea or product derived from an existing source.

Collusion is the presentation by a student of an assignment as his or her own which is in fact the result in whole or part of unauthorised collaboration with another person or persons.

In any case where a student has been involved in plagiarism or collusion in an assessable assignment on task the marks awarded for that will be zero, and no substitution of an alternative task will normally be permitted.

12.0 Reading List

The reading list (as provided in Table 3) provides the literature that a student is expected to go through to understand the topics of the syllabus. However, this list is not an extensive one and may be updated and altered as and when necessary. Students are encouraged to come up with suggested literature in this field for discussion in or off the class.

Table 3: Reading List

Reading	Reference	Suggested Literature
PP-L1-2.1	Lecture 1 &	Derek H. T. Walker and Steve Rowlinson, Procurement Systems, First published 2008 by Taylor & Francis 2



Reading	Reference	Suggested Literature
	Lecture 2	Park Square, Milton Park, Abingdon, Oxon OX14 4RN
PP-L1-2.2		Peter W. G. Morris and Jeffrey K. Pinto, the Wiley guide to project technology, supply chain & procurement management, John Wiley & Sons, Inc, 2007.
PP-L1-2.3		Johan Abrahamsson and Rickard Badenfors, Purchasing Management, Chalmers, 2008.
PP-L1-2.4		JUDITH A. EDWARDS, Project Procurement Management In Practice, THE AMA handbook of project management, second edition.
PP-L1-2.5		Peter Holm Andreasen, The Dynamics of Procurement Management, Copenhagen Business School handelshøjskolen Solbjerg plads 3 dk-2000 frederiksberg Danmark
PP-L1-2.6		Meria kreuza Borges, Project procurement management- a structured literature review, International Journal of Project Management, Volume 35, 2017.
PP-L3-4.1	Lecture 3 & Lecture 4	Enock Gideon Musau (2015), Determinants of Procurement Function and Its Role in Organizational Effectiveness, IOSR Journal of Business and Management (IOSR-JBM) e-ISSN: 2278-487X, p-ISSN: 2319-7668. Volume 17, Issue 2.Ver. III
PP-L3-4.2		Five things you should expect from your procurement function, Scott Blackwood Executive Director, Ernst & Young, New Zealand www.ey.com/...procurement/.../Five_things_you_should_expect_from_procurement .
PP-L3-4.3		A case study – Purchasing organisational structure and competence level, Copenhagen Business School 2012 Master Thesis Hand in date: 16 th of October 2012 studenttheses.cbs.dk/.../elva_sif_ingolfssdottir_og_jonas_henrik_strunge_dyndegaard
PP-L3-4.4		K Karjalainen (2009), Challenges of purchasing centralization, Emperical evidence from public procurement, epub.lib.aalto.fi/pdf/diss/a344.pdf , Helsinki School of Economics, 2009.
PP-L3-4.5		Austrroads, 2014, Building and Construction Procurement Guide – Principles and Options, Sydney, A4,
PP-L5-6.1	Lecture5 Lecture6	Collaborative Optimization – AT Kearney www.middle-east.atkearney.com/.../Collaboration...pdf/
PP-L5-6.2		Wesley S. Boyce (2016), The influence of collaboration in procurement relationships, International Journal of Managing Value and Supply Chains Vol. 7, No. 3, September 2016
PP-L5-6.3		Improving Competitive Advantage Through Procurement Excellence Douglas Martin ANZ Technology Products Manager, Integrated Supply Chain, Global Procurement, IBM October 2014



Reading	Reference	Suggested Literature
PP-L5-6.4		Soojung Oh et al., Managerial capabilities of information technology and firm performance: role of e-procurement system type, International Journal of Production Research, 2014 Vol. 52, No. 15, 4488–4506.
PP-L5-6.5		Karl Inderfurth, The Impact of Information Sharing on Supply Chain Performance under Asymmetric Information, Vol. 22, No. 2, March–April 2013, pp. 410–425 DOI 10.1111/j.1937-5956.2012.01372.x ISSN 1059-1478 EISSN 1937-5956 13 2202 0410 © 2012 Production and Operations Management Society
PP-L5-6.6		ABU HASSIM et al., The Importance of Project Governance Framework in Project Procurement Planning, The Twelfth East Asia-Pacific Conference on Structural Engineering and Construction, 2011.
PP-L7-8.1	Lecture 7 and Lecture 8	Jane C Linder et al., Toward an innovation Sourcing Strategy, MIT sloan management review summer 2003
PP-L7-8.2		Masaaki Kotabe et al., Global Sourcing of Services and Market Performance: An Empirical Investigation, Journal of International Marketing Vol. 6. No. 4. 1998. Pp. 10-31 ISSN 1069-031X.
PP-L7-8.3		Richard Engelbrecht-Wiggans, E-sourcing in Procurement: Theory and Behavior in Reverse Auctions with Noncompetitive Contracts, Management Science, Vol, 52, No, 4, April 2006, pp. 581-596 ISSN 0025-19091
PP-L7-8.4		William M. Sinnett, {bsinnett@fei.org} is Director of Research at Financial Executives Research Foundation (FERF), Global sourcing for Global market, April, 2006.
PP-L9-10.1	Lecture 9 and Lecture 10	Yoram Wind, Vijay Mahajan & Donald J. Swire, An Empirical Comparison of Standardized Portfolio Models, Journal of Marketing, Spring 1983
PP-L9-10.2		Harry M. Markowitz, The Early History of Portfolio Theory: 1600-1960, Financial Analysis Journal, July, 1990.
PP-L9-10.3		Dong Myung Lee and Paul R. Drake, A portfolio model for component purchasing strategy and the case study of two South Korean elevator manufacturers, International Journal of Production Research Vol. 48, No. 22, 15 November 2010, 6651–6682.
PP-L9-10.4		Jafar Rezaei* and Roland Ortt, A multi-variable approach to supplier segmentation, International Journal of Production Research Vol. 50, No. 16, 15 August 2012, 4593–4611
PP-L9-10.5		Jeffrey H. Dyer Dong Sung Cho Wujin Chu, Strategic Supplier Segmentation:, CAUFORNIA MANAGEMENT REVIEW VOL 40. NO. 2 WINTER 1998
PP-L11-12.1	Lecture 11	Marta Andrecka, Corporate Social Responsibility and Sustainability in Danish Public Procurement, CSR and Sustainability in Danish Public Procurement, 2017.



Reading	Reference	Suggested Literature
PP-L11-12.2		XINMING DENG, FACTORS INFLUENCING ETHICAL PURCHASE INTENTIONS OF CONSUMERS IN CHINA, SOCIAL BEHAVIOR AND PERSONALITY, 2013, 41(10), 1693-1704 © Society for Personality Research.
PP-L11-12.3	Lecture 12	Michal J., Why Ethical Consumers Don't Walk Their Talk: Towards a Framework for Understanding the Gap Between the Ethical Purchase Intentions and Actual Buying Behaviour of Ethically Minded Consumers, Journal of Business Ethics (2010) 97:139–158 Springer 2010
PP-L11-12.4		Mark M. Leach, Ethics Standards Impacting Test Development and Use: A Review of 31 Ethics Codes Impacting Practices in 35 Countries, INTERNATIONAL JOURNAL OF TESTING, 7(1), 71–88 Copyright © 2007, Lawrence Erlbaum Associates, Inc.
PP-L11-12.5		Nil Ozcaglar-Toulouse, In search of fair trade: ethical consumer decision making in France, International Journal of Consumer Studies, 30, 5, September 2006, pp502–514
PP-L11-12.6		Hassim, Aliza A., Factors Contributing to Ethical Issues in Project Procurement planning: a case study in Malaysia, QUT Digital Repository: http://eprints.qut.edu.au/
PP-L13-14.1		Scot Case, Environmentally favourable purchasing, Government procurement, October 2002, www.govproc.com .
PP-L13-14.2	Lecture 13 and Lecture 14	M. Baitz et al., Life cycle assessment of PVC in product optimisation and green procurement – fact-based decisions towards sustainable solutions, Plastics, Rubbers and Composites 2005 VOL 34 NO 3.
PP-L13-14.3		ELISA D. WILSON. Environmentally Friendly Health Care Food Services: A Survey of Beliefs, Behaviours, and Attitudes, Canadian Journal of Dietetic Practice and Research-Vol 72 No 3, Fall 2011.
PP-L13-14.4		Joanne Meehan et al., Sustainable Procurement Practice, Business Strategy and the Environment Bus. Strat. Env. 20, 94–106 (2011)
PP-L13-14.5		Christopher Pollington, Legal and procurement practices for sustainable development, Building Research & Information ISSN 0961-3218print/ISSN 1466-4321online # 1999 Taylor & Francis Ltd
PP-L13-14.6		Kyle Goldschmidt, Sustainable Procurement: Integrating Classroom Learning with University Sustainability Programs, Decision Sciences Journal of Innovative Education Volume 11 Number 3 July 2013.
PP-L15-16.1	Lecture 15 and Lecture 16	T Alhazmi, Project procurement system selection model, Journal of Construction Engineering and Management, June-July 2016.



Reading	Reference	Suggested Literature
PP-L15-16.2		Richard M. Kesner, Enabling Business Processes through Information Management and IT Systems: The FastFit and Winter Gear Distributors Case Studies, Journal of Information Systems Education, Vol. 20(4).
PP-L15-16.3		Nabil I. El Sawalhi and Osama El Agha, Multi-Attribute Utility Theory for Selecting an Appropriate Procurement Method in the Construction Projects, Journal of Construction in Developing Countries, 22(1), 75–96, 2017.
PP-L15-16.4		Yi-Ming Taia et al., The performance impact of implementing Web-based e-procurement systems, International Journal of Production Research Vol. 48, No. 18, 15 September 2010, 5397–5414.
PP-L15-16.5		Alok Gupta, Bo-chiuan Su, and Zhiping Walter, An Empirical Study of Consumer Switching from Traditional to Electronic Channels: A Purchase-Decision Process Perspective, International Journal of Electronic Commerce / Spring 2004, Vol. 8, No. 3, pp. 131–161.
PP-L17-18.1	Lecture 17 and Lecture 18	A. Moropoulouf, G. Biscontin, A. Bakolas and K. Bisbikou (1997) Technology and 20thomas20ur of rubble masonry Mortars, Construction and Building Material Vol. 11, No. 2, pp. 119-129.
PP-L17-18.2		Victor C. Li and C. K. Y. Leung (1988) Ceramics for Construction, Construction and Building Materials, Vol. 2 No. 2 pp. 59-68.
PP-L17-18.3		Martin Bichler and Richard Steinberg, Introduction to the Special Issue on E-Auctions for Procurement Operations, Production and operations management Vol. 16, No. 4, July-August 2007.
PP-L17-18.4		M. Jae Moon, e-procurement management in state Governments: diffusion of e-procurement practices and its determinants, Journal of public procurement, volume 5, issue 1, 54-72, 2005.
PP-L17-18.5		Thomas Puschmann and Rainer Alt, Successful Use of e Procurement in Supply Chains, Institute of Technology Management, University of St. Gallen, 20thomas.puschmann@img.com .
PP-L19-20.1	Lecture 19 and Lecture 20	Sajedeh Hasanian and Seyed Mohammad Hossein Hojjati, A Framework for Supplier Selection Criteria in “LARG” Supply Chain based on a Literature Review, International Journal of Management, Accounting and Economics, 3(8), 502-519, 2016.
PP-L19-20.2		S. Sen and H. Basligil, A framework for defining both qualitative and quantitative supplier selection criteria considering the buyer–supplier integration strategies, International Journal of Production Research, Vol. 46, No. 7, 1 April 2008.



Reading	Reference	Suggested Literature
PP-L19-20.3		P. Parthiban, H. Abdul Zubar and Pravin Katarak, Vendor selection problem: a multi-criteria approach based on strategic decisions, International Journal of Production Research Vol. 51, No. 5, 1 March 2013.
PP-L19-20.4		S. Mohammad Arabzad & Mazaher Ghorbani & Jafar Razmi & Hadi Shirouyehzad, Employing fuzzy TOPSIS and SWOT for supplier selection and order allocation problem, Int J Adv Manuf Technol (2015) 76:803–818 DOI 10.1007/s00170-014-6288-3.
PP-L19-20.5		B. Vahdania and M. Zandieh, Selecting suppliers using a new fuzzy multiple criteria decision model: the fuzzy balancing and ranking method, International Journal of Production Research Vol. 48, No. 18, 15 September 2010.
PP-L19-20.6		He-Yau Kang et al., Project Management for a Wind Turbine Construction by Applying Fuzzy Multiple Objective Linear Programming Models, Energies 2016, 9, 1060; doi:10.3390/en9121060, www.mdpi.com/journal/energies .
PP-L21-22.1	Lecture 21 and Lecture 22	Chiaho Chang, A theoretical analysis of ISO 9000 suppliers, Journal of Economics and Economic Education Research, Volume 14, Number 3, 2013.
PP-L21-22.2		Qinglong Gou, Suresh Sethi, Jinfeng Yue and Juan Zhang, Push and Pull Contracts in a Local Supply Chain with an Outside Market, Decision Sciences Volume 47, Number 6 December 2016.
PP-L21-22.3		Yavuz Acara, Sukran Kadipasaoglu and Peter Schipperijn, A decision support framework for global supply chain modelling: an assessment of the impact of demand, supply and lead-time uncertainties on performance, International Journal of Production Research Vol. 48, No. 11, 1 June 2010.
PP-L21-22.4		Ruth Mwikali and Stanley Kavale, Factors Affecting the Selection of Optimal Suppliers in Procurement Management, International Journal of Humanities and Social Science, Vol. 2, No. 14, July 2012.
PP-L21-22.5		Adis Puska et al., Ranking factors for supplier selection with application of the FTOPSIS method, Journal of Economics and Business, Vol XV, Issue I May 2017.
PP-L23-24.1	Lecture 23 and	Tobias Schoenherr and Vincent A. Mabert, An Exploratory Study of Procurement Strategies for Multi-Item RFQs in B2B Markets: Antecedents and Impact on Performance, Production and Operations Management Vol. 20, No. 2, March–April 2011.
PP-L23-24.2	Lecture 24	Laura Venn et al., Blackwell Publishing Ltd Researching European 'alternative' food networks: some methodological considerations, Journal compilation © Royal Geographical Society (with The Institute of British Geographers) 2006.



Reading	Reference	Suggested Literature
PP-L23-24.3		Stephan M. Wagnera and Daniel R. Krauseb, Supplier development: communication approaches, activities and goals, International Journal of Production Research Vol. 47, No. 12, 15 June 2009.
PP-L23-24.4		Olugbenga Jide Olaniran, Barriers to Tacit Knowledge Sharing in Geographically Dispersed Project Teams in Oil and Gas Projects, Project Management Journal, June – July 2017.
PP-L23-24.5		Anupam Kumar Nath, Web 2.0 for Knowledge Management in Organizations and Their Effects on Tacit Knowledge Sharing and Perceived Learning, Journal of Accounting – Business & Management vol. 22 no. 2 (2015).
PP-L25-26.1	Lecture 25 and Lecture 26	Khosrow Noshada and Anjali Awasthib, Supplier quality development: A review of literature and industry practices, International Journal of Production Research, Vol. 53, No. 2, 2015.
PP-L25-26.2		K. N. Anand, Supplier quality assurance: Mistrust, myths, misconception, misdirection and medicine, Total Quality Management, vol. 7, no. 5, 1996.
PP-L25-26.3		Niall Reynolds, Managing International Contract Administration, AACE INTERNATIONAL TRANSACTIONS, 2008.
PP-L27-28.1	Lecture 27 and Lecture 28	Jie Yang, Harnessing value in knowledge management for performance in buyer–supplier collaboration, International Journal of Production Research, Vol. 51, No. 7, 2013.
PP-L27-28.2		Thomas Claufs, The influence of the Type of Relationship on the Generation of Innovations in Buyer–Supplier Collaborations, CREATIVITY AND INNOVATION MANAGEMENT, Volume 21 Number 4, 2012.
PP-L27-28.3		Jessica J. Andrews, Deirdre Kerr, Robert J. Mislevy, Alina von Davier, Jiangang Hao, and Lei Liu, Modeling Collaborative Interaction Patterns in a Simulation-Based Task, Journal of Educational Measurement Spring 2017, Vol. 54, No. 1, pp. 54–69.
PP-L27-28.4		Jennifer Olsen and Vincent Aleven, Statistically Modeling Individual Students' Learning Over Successive Collaborative Practice Opportunities, Journal of Educational Measurement Spring 2017, Vol. 54, No. 1, pp. 123–138.
PP-L29-30.1	Lecture 29 and Lecture 30	Srivastava, R., and W. C. Benton Jr., Introduction to Purchasing and Supply Chain Management, Part One, Journal of Operational Research 110 (1998).
PP-L29-30.2		Yasemin Kocaoğlu et al., Supply Chain Optimization Studies: A Literature Review and Classification, This paper was presented at the “The 15 th International Logistics and Supply Chain Congress (LMSCM)” on October 19-20, 2017.



Reading	Reference	Suggested Literature
PP-L29-30.3		Anantaram Balakrishnan and Harihara Prasad Natarajan, Integrated Procurement Planning in Multi-division Firms, Production and Operations Management, Vol. 23, No. 10, October 2014.
PP-AS-01	Assignment material:: Materials for the purpose of writing the assignments PFMS operation	
PP-AS-02	Assignment material:: Integrated operation of management including procurement.	

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For any query please contact the subject coordinator over phone or email.

The study materials for the entire subject have been developed and will be available electronically.



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MASTER OF CONSTRUCTION MANAGEMENT
ASSAM ENGINEERING COLLEGE
GUWAHATI-781013

PROJECT RISKS AND QUALITY MANAGEMENT
(SUBJECT GUIDE)

(Version-1.0)
Developed by –Dr.Sudip Kumar Deb



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1.0 INTRODUCTION

Projects are subject to various uncertainties that have negative effect on activity durations. This is most apparent in the case of construction projects. The frequency and impact of risks depend on project-specific, contractor-specific and location-specific conditions. Identifying critical sources of risk is crucial to minimize disturbance in project development and assure success by imparting quality in project.

Risk management is important in an organisation because without it, a firm cannot possibly define its objectives for the future. Risk management jobs are usually considered as financial careers because most of the risks that businesses face are closely tied to the company's financial standing. The purpose of risk management is to identify potential problems before they occur so that risk-handling activities may be planned and invoked as needed across the life of the product or project to mitigate adverse impacts on achieving objectives.

2.0 OVERVIEW & OBJECTIVES OF THE SUBJECT

This subject **Project Risk and Quality** will explore and develop the key concepts and techniques necessary to understand and practise the core project management competencies of risk and quality management. Topics in risk management include planning for and identifying risks, performing risk analysis, and responding to and controlling risk. Topics in quality management include planning for quality, performing quality assurance and controlling. Students work independently and in small groups on a range of assessment tasks. This subject contributes to the graduate attributes of critical thinking, communication and an ability to apply tools and techniques and adapt project management knowledge to meet contextual demands.

3.0 LEARNING OUTCOMES

This subject will develop the following program learning outcomes.

On successful completion, students should be able to:

- Demonstrate ability to prepare appropriate risk, procurement and quality management plans for projects.



- Demonstrate ability to use core tools and techniques to identify and resolve risk, procurement and quality issues in projects
- Demonstrate ability to link risk, procurement and quality concepts to the project framework
- Demonstrate a reflective and professional approach to project management practice
- Get basic knowledge on doing research for sustainable materials.

4.0 GENERIC SKILLS

On completion of the subject students should have developed the following skills and capabilities:

- Ability to effectively use oral and written communication in projects at a professional level.
- Ability to source and apply tools and techniques to meet contextual demands.
- Ability to apply foundational project management knowledge in projects.
- Ability to apply methods and tools to analyse data and information for managing projects.
- Ability to think critically and synthesise complex data.

5.0 DETAILED SUBJECT SCHEDULE

Total contact period: 45 hours
Duration of Lecture: 1 Hour
Duration of Tutorial: 1 hours

Table 1: Detailed subject schedule

Week No.	Lecture	Topic	Learning Activities
1	Lecture 1:	Overview of project management principles to highlight the role of • Risk • Quality	Reading list: PRQ-L1-2.1 PRQ-L1-2.2 PRQ-L1-2.3 PRQ-L1-2.4



Week No.	Lecture	Topic	Learning Activities
	Lecture 2:	- Uncertainty, - Risk, and - Their Management	PRQ-L1-2.5 (Essential) CM-L1-2.2 (Optional)
	Tutorial 1:	Worked Examples and Reflections (Lecture 1 & 2)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 1 & 2.
2	Lecture 3:	Implications of the Project Life Cycle - Life cycle costing - Stakeholder uncertainty	Reading list: PRQ-L3-4.1 PRQ-L3-4.2 PRQ-L3-4.3 PRQ-L3-4.4 PRQ-L3-4.5
	Lecture 4:	Formal Risk Management Processes	
	Tutorial 2:	Worked Examples and Reflections (Lecture 3 & 4)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 3 & Lecture 4.
3	Lecture 5:	An Outline Generic Process. Structure	Reading list: PRQ-L5-6.1 PRQ-L5-6.2
	Lecture 6:	Risk Management Purposes: The Define Phase	PRQ-L5-6.3 (Essential) PRQ-L5-6.4 (Optional)
	Tutorial 3:	Worked Examples and Reflections (Lecture 5 & 6)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 5 & 6.



Week No.	Lecture	Topic	Learning Activities
4	Lecture 7:	Risk Management Process: The Focus Phase	Reading list: PRQ-L7-8.1 PRQ-L7-8.2 PRQ-L7-8.3 PRQ-L7-8.4 (Essential) PRQ-L7-8.5 (Optional)
	Lecture 8:	Identify the Risks and Responses: The Identify Phase	
	Tutorial 4:	Worked Examples and Reflections (Lecture 7 & 8)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 7 & 8.
5	Lecture 9:	Develop the Analysis Structure: The Structure Phase	Reading list: PRQ-L9-10.1 PRQ-L9-10.2 PRQ-L9-10.3 PRQ-L9-10.4 (Essential)
	Lecture 10:	Clarify Ownership Issues: The Ownership Phase	
	Tutorial 5:	Worked Examples and Reflections (Lecture 9 & 10)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 9 & 10.
6	Lecture 11:	- Estimate in Terms of Scenarios and Numbers: - The Estimate Phase	Reading list: PRQ-L11-12.1 PRQ-L11-12.2 PRQ-L11-12.3 (Optional)
	Lecture 12:	- Evaluate the Estimates and Their Implications: - The Evaluate Phase --	Reading list: PRQ-L11-12.4 PRQ-L11-12.5 (Optional)
	Tutorial 6:	Worked Examples and Reflections (Lecture 11 & 12)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 11 & 12.



Week No.	Lecture	Topic	Learning Activities
7	Lecture 13:	Plan the Project and Its Risk The Plan Phase	Reading list: PRQ-L13-14.1 (Essential) PRQ-L13-14.2 (Optional)
	Lecture 14:	Manage the Project and Its Risk: The Manage Phase --	Reading list: PRQ-L13-14.3 PRQ-L13-14.4 (Essential)
	Tutorial 7:	Worked Examples and Reflections (Lecture 13& 14)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 13 & 14.
8	Lecture 15:	Organising for Risk Management Enterprise risk management Virtual risk organization	Reading list: PRQ-L15-16.1 PRQ-L15-16.2 (Essential)
	Lecture 16:	Risk management performance Information Processing and	PRQ-L15-16.3 PRQ-L15-16.4 PRQ-L15-16.5 (Essential)
	Tutorial 8:	Worked Examples and Reflections (Lecture 15& 16)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 15& 16.
	Assignment 1:	Analysis of Building Materials used in a Building (Draft Report to be Submitted)	
9	Lecture 17:	Quality management process • Plan and perform • Control	Reading list: PRQ-L17-18.1 PRQ-L17-18.2 PRQ-L17-18.3 PRQ-L17-18.4 (Essential) Reading list: PRQ-L17-18.5 (Optional)
	Lecture 18:	Quality management Tools and techniques Basic quality tools	



Week No.	Lecture	Topic	Learning Activities
	Tutorial 9:	Worked Examples and Reflections (Lecture 17 & 18)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 17 & 18.
10	Lecture 19:	- Design of experiment - Statistical sampling	Reading list: PRQ-L19.1 PRQ-L19.2 PRQ-L19.3 (Essential)
	Lecture 20:	Process improvement plan Quality matrices	Reading list: PRQ-L20.1 PRQ-L20.2 PRQ-L20.3 (Essential)
	Tutorial 10:	Worked Examples and Reflections (Lecture 19& 20)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 19& 20.
11	Lecture 21:	Quality Assurance - Tree diagram - Matrix diagram	Reading list: PRQ-L21-22.1 PRQ-L21-22.2 PRQ-L21-22.3 PRQ-L21-22.4 (Essential) PRQ-L21-22.5
	Lecture 22:	Quality audit	
	Tutorial 11:	Worked Examples and Reflections (Lecture 21& 22)	Discussions/quiz etc. based on the contents of CM-L24.1 Essential Readings of Lecture 21& 22.
12	Lecture 23:	Quality control	Reading list: PRQ-L23-24.1 PRQ-L23-24.2 PRQ-L23-24.3 PRQ-L23-24.4
	Lecture 24:	Tools and techniques	



Week No.	Lecture	Topic	Learning Activities
			PRQ-L23-24.5
	Tutorial 12:	Worked Examples and Reflections (Lecture 23& 24)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 23& 24.
	Assignment 2:	Analysis of Building Materials used in a Building (Draft Report to be Submitted after peer review.)	
13	Lecture 25:	Inspection	Reading list: PRQ-L25-26.1 PRQ-L25-26.2 PRQ-L25-26.3 PRQ-L25-26.4 PRQ-L25-26.5
	Lecture 26	Quality control outputs	
	Tutorial 13:	Worked Examples and Reflections (Lecture 25 & 26)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 25 & 26.
14	Lecture 27	Quality standards	Reading list: PRQ-L27-28.1 PRQ-L27-28.2 PRQ-L27-28.3
	Lecture 28:	Training programmes	Reading list: PRQ-L27-28.4 PRQ-L27-28.5 PRQ-L27-28.6
	Tutorial 14:	Worked Examples and Reflections (Lecture 27& 28)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 27 & 28.
	Assignment 3:	Analysis of Building Materials used in a Building (Final Report to be submitted)	
15	Lecture 29:	Organizational process Project performance and quality	Reading list: PRQ-L29-30.1



Week No.	Lecture	Topic	Learning Activities
			PRQ-L29-30.2 PRQ-L29-30.3 PRQ-L29-30.4 PRQ-L29-30.5
	Lecture 30:	Computer-Based System for Quality Management	
	Tutorial 15:	Worked Examples and Reflections (Lecture 29 & 30)	Discussions/quiz etc. based on the contents of Essential Readings of Lecture 29& 30.
16	Group Discussions	Date and Topics TBA later	
	Final Presentations	Date and Topics TBA later	

6.0 PEDAGOGICAL APPROACH, ACTIVITIES

The pedagogical approach is based on classroom lectures of up to 1 hour duration twice a week during the course. The lectures will involve a range of teaching topics, which will include theoretical background on basic project procurement management principles. The teaching modes apart from classroom lectures will include group various activities such as, group tasks, site visits, preparation of case studies, evaluation of existing managerial practices in terms of their performance, and guest presentations from industry professionals on specific topics to provide both specialist knowledge and state of the practice to give an insight to real world issues. Seminars will be held every week so that each student can share their knowledge, ask questions and dive further in to the subject materials.

The timings of the scheduled activities will be provided at the beginning of the course, depending on the annual academic calendar of the college.

7.0 ASSESSMENT

Assessment in this subject has both formative and summative aspects to it. The students will have an opportunity to provide formative feedback to their peers and receive constructive feedback in return, as well as from the subject coordinator. This will give them the opportunity to develop and improve on particular skills throughout the course of the subject.

There are five assessment tasks in this subject. The assessment tasks (class participation, assignment 1 to 3 and final presentation) mimic the activities that a



student is most likely to undertake in a real situation. This task will be used to demonstrate that the student have developed the skills needed to understand the behaviour of appropriate type of material.

The students' main tasks will be to identify appropriate type of material, study different characteristics and present their findings in a professional report and an oral presentation. A summary of the marking scheme is provided in Table 2. Specific requirements for each task are provided in section 7.1 and 7.2.

7.1 Class participation

The subject involves a range of activities and participation of the student is critical for achieving the learning outcome of the subject. The assessment for this task will involve a number of in-class discussion and quizzes relating to content covered during tutorials. The students will be assessed on their ability to

- Understand and interpret themes discussed during seminars
- Respond appropriately to questions.

7.2 Assignment

7.2.1 Risk assessment of construction project undertaken by PWD in Govt. Engineering Colleges.

As a part of R & D or task monitoring team investigating different forms of risk involved with the construction project undertaken by PWD in Government Engineering Colleges, the student will be asked to undertake an analysis of different types of infrastructure development projects completed, incomplete or in progress in a systematic manner in order to ascertain the effectiveness and quality of such projects under their terms and condition of approval. This will include

- Identification of different types of construction project during last three years.
- Carry out a critical analysis of the procedural approach right from the initial tendering to work order issue.
- Examining and conducting risk assessment by following (i) risk assessment data sheet and (ii) risk assessment matrix, the detail procedure is attached in reading materials.
- Critically analyse the procedure and tools adopted and scope of risk mitigation or reduction.
- Critical review of the used methodology and compare with modern e-project monitoring policy as depicted in PFMS portal.

Risk assessments typically will be performed by an assessment team made up of project managers, technical staff, operating and field staff members, student and selected stakeholders as appropriate. The make-up of the team will vary, based on the project element and its position in the baseline hierarchy. The results of all project risk assessments will be maintained.

The analysis of the current study as well as the recommendations with explanations will have to be submitted to the Co-ordinator of the course with a copy to Principal, AEC in the form of a report. Such assignments on risk assessments will be performed to support the change request process, when



baseline adjustments are necessary, or to support the decision process for selection and implementation of technical alternatives.

The exact structure of the report is up to the student, but the student should attempt to address the above mentioned areas in his/her report.

Report format

The report should be presented in A4 format with margins of 2.50m in each side and the pages numbered. The line spacing should be 1.50 cm. Both sides of the page should be utilized for printing.

Heading, tables, diagrams are to be used and appropriately numbered. An abstract or executive summary at the beginning of the report is to be included (which will include key findings and recommendations). There is no page limit as such for the report, but it should be approximately 5000 words in length (excluding tables, diagrams and references)

Use of references to existing research/literature in order to support the argument of the report is to be included and properly referenced. The Harvard referencing format (i.e. Author (year)) should be used to cite specific references and all the references should be referred to in a 'References' section at the end of the report.

As the student will be presenting the report and its major findings to the Head of office administration (subject coordinator and invited panel members) during the last week of the semester, the report should be written in a style and format that reflects its intended purpose, considering that the report is being drafted by a responsible member of academic corporate.

The students are advised to refer to online skill development courses provided by www.coursera.org to get a better idea of how to put their ideas to words. The following links may be useful for the students
<https://www.coursera.org/learn/business-writing>
<https://www.coursera.org/specializations/academic-english>

Submission – Draft Report

The students are required to submit a draft of their report in week 8. The draft report should, as a minimum be structured and formatted as it is planned to present the final report. It should include all the items as mentioned in clause 7.2.1

The Draft Report should not provide any identifying details (name, enrolment number etc) that could be used to identify the student, as the peer review process will be anonymous. Submit your draft report in print form with proper spiral bind.

7.2.2 Peer Review

Students are required to critically review one of their colleagues' draft reports and provide constructive feedback on how they might be improved. The review should be approximately between 500-1000 words. Primary focus should be on the



strengths and weakness of the peer's draft report and how well they address the requirement of the task across the following criteria.

- Abstract / Executive summary
- Table of contents provided
- Ability to map the existing types of building materials and their properties.
- Use of diagrams/description to effectively illustrate the problem at hand.
- Indication of potential areas for improvement by using alternative materials in the line of typology, weather, location, vulnerability towards natural disaster etc.
- Indication of potential areas for improvement in the form of energy efficiency, carbon footprint and sustainability issues.
- Suggested solutions.
- Presented in a concise, professional and well-structured manner.
- Integration of references to relevant literature.

The peer review should focus on making suggestions to help the peer further develop and improve their report.

Peer review assessment criteria

The student will be assessed in his ability to:

- Demonstrate a complete understanding on the subject matter.
- Apply that understanding to the analysis and critique of the peer's draft report.
- Critically evaluate the work of peer's and provide constructive feedback.
- To use skill and sensitivity in providing formative (constructive) feedback to peers.

The peer feedback of a draft report of a student will be provided to the student after the completion of the process i.e. by Week 12.

7.2.3 Submission – Final Report

The final report should be submitted in printed form after considering and incorporating the suggestions made in the peer review comments (if any). Reports submitted after the due date will incur a 10 % penalty of the available marks in that section, unless prior application for special consideration has been submitted and approved.

Final Report Assessment Criteria

The student will be assessed on their ability to

- Identify different types of risk associated with construction project and able mapping of their correct measuring steps in order to mitigate risk.
- Use of diagrams/description to effectively illustrate the problem at hand.
- Indicate potential areas for improvement by using alternative methods in order to deduce risk in project life cycle.
- Indicate potential areas for improvement in the form of project quality.
- Suggested solutions.
- Presented in a concise, professional and well-structured manner.
- Integration of references to relevant literature.

7.2.4 Final Presentation

The student will present the major findings from his/her final report to the panel members (co-ordinator and invited reviewers). The ideas that have been identified have to be presented.



Format

The presentation should be addressed to the panel members, The student is welcome to present in an own format, but it has to be remembered that the format maximises the exposure to the content of the presentation.

Presentation : 15 minutes followed by Q & A: 5 minutes

Assessment Criteria

The presentation will be assessed by the panel members on the way of presentation and communication skills. The student will be assessed on his/her ability to:

- Describe the use of different engineering materials.
- Describe the suggested changes in using materials.
- Convince the panel members of the need to change the practices and explain the rationale behind it.
- Communicate the findings of the evaluation of the present building.

Presentation date: Week 16.

Students are required to be available for the entire week. The time of presentation will be advised at a later date.

7.3 Marking Scheme (It is to be revised as per Indian University/Affiliated university regulation)

Table 2 provides the detailed marking scheme in this subject.

Table 2: Summary of Assessment Tasks and Marking scheme

Assessment category	Brief Discussion	Weight (%)	Pass (%)	To pass, a student has to	
				obtain a minimum marks of	Out of
Class participation	Participation in weekly activities and active involvement in class discussion	10	4	8	20
Assignment 1 (Draft)	See Below	10	4	8	20
Assignment 2 (Peer Review)	Review of peer report (1000 words)	10	4	8	20
Assignment 3 (Final)	Professional report outlining as assessment of building materials and suggestions for improvement. (5000 words)	10	4	8	20



<i>Assessment category</i>	<i>Brief Discussion</i>	<i>Weight (%)</i>	<i>Pass (%)</i>	<i>To pass, a student has to</i>	
				<i>obtain a minimum marks of</i>	<i>Out of</i>
Final Presentation	Presentation of report findings and recommended improvements.	10	4	8	20
End semester exam	Theory based.	50	20	40	100
Total	--	100	40	80	200

The students will have to appear in an end semester examination (as per the guidelines of the University under which AEC is affiliated) which will be subjective in nature. A minimum mark of 40% (each assessment category) must be achieved in the examination in order to pass the subject. The assignments/ presentations can be re-submitted in a semester if a student fails to score the requisite pass marks. However, if a student fails to achieve 40 % marks in the theory exam he will be deemed to fail in the subject and will have to clear in the next attempt.

8.0 REQUIRED READING

Students are expected to refer to various building operations and services related topics from various sources, which might include case studies, conferences papers, library collections, e-Books and e-Journals. A list of essential and optional reading is provided in Table – 3, Clause 13.

9.0 REQUIRED TEXTS

1. Bruce T. Barkley, Project Risk Management, Mc Graw Hill, 2004.
2. Christ Chapman, Stephen Ward, Project Risk management: Process Techniques, Willey, New York, 1997.
3. Rose, Kenneth, Project Quality Management, J. Ross Publishing, 2014.
4. Abdul Razzak Rumane, Quality Management in Construction Project, Taylor and Francis, 2011.



REFERENCE BOOKS

1. Martin Lowemore, Risk Management in Project, Taylor and Francis, 2006.
2. D. Van, Well Stam, Project Risk Management: An essential tool for managing and controlling projects, London, Kogan Page, 2004.
3. John Raftery, Risk Analysis in Project Management, Taylor and Francis, 1994.
4. Louis Y. Pouliquen, Risk Analysis in Project Appraisal, Johns Hopkins Press, 1970.

10.0 ATTENDANCE POLICY

The attendance policy is as per the standard university guidelines (under which AEC is affiliated).

11.0 PLAGIARISM, COLLUSION AND CONSEQUENCES

Merriam-Webster's online dictionary explains that **Plagiarism** is the act of stealing and passing off (the ideas or words of another) as one's own; or using another's production without crediting the source; or to commit literary theft i.e. to present as new and original an idea or product derived from an existing source.

Collusion is the presentation by a student of an assignment as his or her own which is in fact the result in whole or part of unauthorised collaboration with another person or persons.

In any case where a student has been involved in plagiarism or collusion in an assessable assignment on task the marks awarded for that will be zero, and no substitution of an alternative task will normally be permitted.

12.0 Reading List

The reading list (as provided in Table 3) provides the literature that a student is expected to go through to understand the topics of the syllabus. However, this list is not an extensive one and may be updated and altered as and when necessary. Students are encouraged to come up with suggested literature in this field for discussion in or off the class.

Table 3: Reading List

Reading	Reference	Suggested Literature
PRQ-L1-2.1	Lecture 1 & Lecture 2	Anna Corinna Cagliano, Sabrina Grimaldi and Carlo Rafele, Choosing project risk management techniques. A theoretical framework, Journal of



Reading	Reference	Suggested Literature
		Risk Research, 2015 Vol. 18, No. 2, 232–248.
PRQ-L1-2.2		Roque Rabechini Junior and Marly Monteiro de Carvalho, Understanding the Impact of Project Risk Management on Project Performance: an Empirical Study, J. Technol. Management Innovation, 2013, Volume 8, Special Issue ALTEC.
PRQ-L1-2.3		Kaouthar Lajili Daniel Zeghal, A Content Analysis of Risk iVnagement Disclosures in Canadian Annual Reports, Canadian Journal of Administrative Sciences, Vol 22(2), 2005.
PRQ-L1-2.4		Paul Newton, Managing Project Risks, ISBN 978-1-62620-986-4. www.free-management.ebooks.com .
PRQ-L1-2.5		Book chapter:: Introduction to Risk Analysis and Risk Management Processes, © Springer Science+Business Media Singapore 2015 I. Häring, Risk Analysis and Management: Engineering Resilience, DOI 10.1007/978-981-10-0015-7_2.
PRQ-L1-2.6		Olap Passenheim, Enterprise Risk Management, E-book, www.bookboon.com .
PRQ -L3-4.1		Olufolahan Oduyemi et al., Risk assessment methods for life cycle costing in buildings, Sustainable Building Journal, 1, 3 (2016).
PRQ -L3-4.2		STEPHEN WARD and CHRIS CHAPMAN, Stakeholders and uncertainty management in projects, Construction Management and Economics (June 2008) 26, 563–577.
PRQ L3-4.3	Lecture 3 & Lecture 4	BRIAN J. GALLI, Risk Management in Project Environments-Reflection of the standard Process, Journal of modern project management • September/December, 2017.
PRQ -L3-4.4		Chrissie Hastings, Supervisory investigation as part of the wider risk management process, British Journal of Midwifery, January 2015, Vol 23, No 1.
PRQ -L3-4.5		Ion Croitoru, Organizational culture-Factor of Effectiveness of Risk management process, Internal Auditing and Risk management, Vol 2(42), June 2016.
PRQ -L5-6.1	Lecture 5 & Lecture 6	Lidia Mandru, How to control risks? Towards a structure of enterprise risk management process, Journal of Public Administration, Finance and Law, issue 9, 2016.
PRQ -L5-6.2		Wilhelm Kross, Operational Risk: The Management Perspective, Value & Risk AG, PO Box 1705, Bad Homburg, 61287, Germany, Tel. +49(0)170-461 8923, Wilhelm.Kross@Valuerisk.com .



Reading	Reference	Suggested Literature
PRQ -L5-6.3		Gerald Berk et al., Finding Institutional Purpose: Enterprise, Risk Management, and Learning, Journal of Public Administration Research and Theory, May 2010.
PRQ -L5-6.4		Hans Georg Jodl, Risk in the implementation of construction projects – defining the risk, Geomechanics and Tunnelling, 7 (2014), No. 6.
PRQ-L7-8.1	Lecture 7 and Lecture 8	Teena Sam et al., Risk evaluation and mitigation strategies: a focus on Belatacept, Progress in Transplantation, Vol 23, No. 1, March 2013.
PRQ-L7-8.2		Marco van Gelderen Roy Thurik Niels Bosma, Success and Risk Factors in the Pre-Startup Phase, Small Business Economics (2006) 26: 319–335 Springer 2006.
PRQ-L7-8.3		Nick Wilson et al., Prioritizing risk factors to identify preventive interventions for economic assessment, Bull World Health Organ 2012;90:88–96.
PRQ-L7-8.4		Research starters academic topic overviews, Business Impact Analysis, © 2014 EBSCO Information Services, Inc.
PRQ-L7-8.5		Alvaro Sanchez-Cazorla et al., Risk Identification in Megaprojects as a Crucial Phase of Risk Management: A Literature Review, Project Management Journal, December/January 2017.
PRQ-L9-10.1	Lecture 9 and Lecture 10	M. Elisabeth Paté-Cornell et al., The Respective Roles of Risk and Decision Analyses in Decision Support, Decision Analysis Vol. 3, No. 4, December 2006.
PRQ-L9-10.2		Farnad Nasirzadeh, Abbas Afshar, and Mostafa Khanzadi, Dynamic risk analysis in construction projects, Canadian J. Civil Eng. 35: 820–831 (2008).
PRQ-L9-10.3		Ryan R. J. McAllister, Bruce M. Taylor, and Ben P. Harman, Partnership Networks for Urban Development: How Structure is Shaped by Risk, The Policy Studies Journal, Vol. 43, No. 3, 2015.
PRQ-L9-10.4		Barry Ziering et al., Property size and risk: why bigger is not always better, Journal of real estate portfolio management, vol 5(2), 1999.
PRQ-L11-12.1	Lecture 11 and Lecture 12	Claudia Pedroza et al., Estimating relative risks in multicenter studies with a small number of centers — which methods to use? A simulation study, Pedroza and Truong Trials (2017) 18:512.
PRQ-L11-12.2		Claudia Pedroza et al., Performance of models for estimating absolute risk difference in multi-center trials with binary outcome, Pedroza and Truong BMC Medical Research Methodology (2016) 16:113.



Reading	Reference	Suggested Literature
PRQ-L11-12.3		Afrooz Moatari-Kazerouni et al., A proposed occupational health and safety risk estimation tool for manufacturing systems, International Journal of Production Research, 2015 Vol. 53, No. 15.
PRQ-L11-12.4		Olufolahan Oduyemi et al., Risk assessment methods for life cycle costing in buildings, Sustainable Building 1, 3 (2016).
PRQ-L11-12.5		Christopher J. Wolfe et al., The Effect of Partition Dependence on Assessing Accounting Estimates, AUDITING: A JOURNAL OF PRACTICE & THEORY, Vol. 36, No. 3, 2017.
PRQ-L13-14.1	Lecture 13 and Lecture 14	Ian Beale, Best practice vendor risk management in today's interconnected world, Journal of Business Continuity & Emergency Planning Volume 11 Number 2, 2017.
PRQ-L13-14.2		Andreas Rimbo "ck • Anton Loipersberger, Integral risk management: steps on the way from theory to practice, Nat Hazards (2013) 67:1075–1082.
PRQ-L13-14.3		Anna Corinna Cagliano et al., Choosing project risk management techniques. A theoretical framework, Journal of Risk Research, 2015 Vol. 18, No. 2, 232–248.
PRQ-L13-14.4		Tiendung Le et al., Assessing Scope and Managing Risk in the Highway Project Development Process, Journal of Construction Engineering and Management © ASCE / September 2009.
PRQ-L15-16.1	Lecture 15 and Lecture 16	Cécile Wendling, Incorporating Social Sciences in Public Risk Assessment and Risk Management Organisations, European Journal of Risk Regulation, Vol 1, 2014.
PRQ-L15-16.2		Martha Grabowski and Karlene H. Roberts, Risk Mitigation in Virtual Organizations, ORGANIZATION SCIENCE, Vol. 10, No. 6, 1999.
PRQ-L15-16.3		Enterprise Risk Management, RESEARCH STARTERS ACADEMIC TOPIC OVERVIEWS, EBSCO Research Starters® • Copyright © 2014 EBSCO Information Services, Inc. • All Rights Reserved.
PRQ-L15-16.4		Dawn Story and Trevor J. Price, Corporate Social Responsibility and Risk Management, JCC 22 Summer 2006.
PRQ-L15-16.5		JAMES F. FAIRBANK et al., Information Processing Design Choices, Strategy, and Risk Management Performance, Journal of Management Information Systems / Summer 2006, Vol. 23, No. 1.
PRQ-L17-18.1	Lecture 17 and Lecture 18	Chu-hua Kueia and Min H. Lub, Integrating quality management principles into sustainability management, Total Quality Management, Vol. 24, No. 1, 2013.



Reading	Reference	Suggested Literature
PRQ-L17-18.2		Ng Wee Leng, Total Quality Management Principles that Influence the Integration of Information and Communications Technology into the Classroom, The Asia-Pacific Education Researcher 18:2 (2009), pp. 317-327.
PRQ-L17-18.3		Leonhard E. Bernold, M.ASCE, Applying Total-Quality-Management Principles to Improving Engineering Education, JOURNAL OF PROFESSIONAL ISSUES IN ENGINEERING EDUCATION AND PRACTICE © ASCE / JANUARY 2008.
PRQ-L17-18.4		Vasileios Ismyrlis and Odysseas Moschidis, The use of quality management systems, tools, and techniques in ISO 9001:2008 certified companies with multidimensional statistics: the Greek case, Total Quality Management, Vol. 26, No. 5, 2015.
PRQ-L17-18.5		Su Mi Dahlggaard-Parka et al., Diagnosing and prognosticating the quality movement – a review on the 25 years quality literature (1987–2011), Total Quality Management, 2013 Vol. 24, No. 1.
PRQ-L19.1	Lecture 19	Randall P. Niedz & Terence J. Evens, Design of experiments (DOE)—history, concepts, and relevance to in vitro culture, In Vitro Cell.Dev.Biol.—Plant (2016).
PRQ-L19.2		Sqren Bisggard, A comparative analysis of the performance of Taguchis, linear graphs for the design of two level fractional factorials, Journal of Applied Statistical, Vol 45, 1996.
PRQ-L19.3		Ralph Cassady, Statistical sampling techniques and marketing research, The journal of marketing, Vol IX, 1945.
PRQ-L20.1	Lecture 20	Paul F. Zantek et al., Process and Product Improvement in Manufacturing Systems with Correlated Stages, Management Science, Vol. 48, No. 5, May 2002.
PRQ-L20.2		Cody R. Cox, Lean Manufacturing: An Analysis of Process Improvement Techniques Cody, Franklin Business & Law Journal, Vol 2, 2015.
PRQ-L20.3		Tom Kendrick, Program Manager, Hewlett-Packard, Defining and Implementing Metrics for Project Risk Reduction, www.failureproofprojects.com/metrics2005.pdf .
PRQ-L21-22.1	Lecture 21 and Lecture 22	Matthew Ticklea et al., Business improvement tools and techniques: a comparison across sectors and industries, International Journal of Production Research, 2015 Vol. 53, No. 2.
PRQ-L21-22.2		Yue Yin, Using Tree Diagrams as an Assessment Tool in Statistics Education, Educational Assessment, 17:22–50, 2012.



Reading	Reference	Suggested Literature
PRQ-L21-22.3		Jessica L. Chapman, A Matrix Representation of System Structure with Application to Computational Reliability Assessments, <i>Quality Engineering</i> , 25:418-436, 2013.
PRQ-L21-22.4		Issam MF Saltaji, Corporate Governance and external auditors: High auditing quality, Internal auditing and risk management, No 2(42), 2016.
PRQ-L21-22.5		Yoram Goldberg · Armin Shmilovici, An expert system approach for quality assurance auditing, <i>International J Advanced Manufacturing Technology</i> (2005) No. 26.
PRQ-L23-24.1	Lecture 23 and Lecture 24	Mehran Ebrahimi and Mehran Sadeghi, Quality management and performance: An annotated review, <i>International Journal of Production Research</i> , 2013 Vol. 51, No. 18.
PRQ-L23-24.2		Nadia Mushtaq et al., Design of Attribute Control Chart Based on Regression Estimator, <i>Pak.j.stat.oper.res.</i> Vol.XIII No.3 2017 pp589-601.
PRQ-L23-24.3		Peter Cronemyra and Mikael Danielssonb, Process Management 1-2-3 – a maturity model and diagnostics tool, <i>Total Quality Management</i> , 2013 Vol. 24, No. 8.
PRQ-L23-24.4		Cody R. Cox, Lean Manufacturing: An Analysis of Process Improvement Techniques, <i>Franklin Business & Law Journal</i> , Vol 2, 2015.
PRQ-L23-24.5		Michael Wood, Statistical process monitoring in the twenty-first century, <i>Handbook of Statistical Methods for Engineers and Scientists</i> , 2nd edn, pp. 7.3–7.28. New York: McGraw-Hill, 1998.
PRQ-L25-26.1	Lecture 25 and Lecture 26	Sou-Sen Leu & Bing-Rong Tzeng, A CPM-Based Construction Quality Inspection and Decision-Aid System, <i>Computer-Aided Civil and Infrastructure Engineering</i> 15 (2000).
PRQ-L25-26.2		Daine J Reyneirs, The delivery and control of quality supplier-Producer contracts, <i>Management Science</i> , Vol 41, No.10, October 1995.
PRQ-L25-26.3		Paul Schreyer, Output, outcome, and quality adjustment in measuring health and education services, <i>Review of Income and Wealth Series</i> 58, Number 2, June 2012.
PRQ-L25-26.4		Rufaidah .AlMaiana et al., Analyzing supplier quality management practices in the construction industry, <i>Quality Engineering</i> , Vol 2, 2016.
PRQ-L25-26.5		Sang-Chul Kim and Yong-Woo Kim, Workforce information database system to support production planning in construction projects, <i>Journal of civil engineering and management</i> , volume 18(6):2012.



Reading	Reference	Suggested Literature
PRQ-L25-26.6		Shelly Lillé and Wendy Marshall, EQUIP: Enhancing Quality Using the Inspection Program, Radiologic Technology, May/June 2017, Volume 88, Number 5.
PRQ-L27-28.1	Lecture 27 and Lecture 28	Carl Gaigne et al., Quality standards, industry structure, and welfare in a global economy, Amer. J. Agr. Econ. 98(5): 1432–1449; June 16, 2016.
PRQ-L27-28.2		Nina Shina et al., Korean Standard Quality Excellence Index for strategic quality planning and improvement, Total Quality Management, 2016 Vol. 27, No. 7.
PRQ-L27-28.3		Min Chen and Konstantinos Serfes, Minimum quality standard regulation under imperfect quality observability, J Regul Econ (2012) 41:269–291.
PRQ-L27-28.4		Jonathan Elliott and Carla Lopez del Puerto, Development of an attitudes and intentions scale for construction skills training programs, journal of employment counselling, September 2015, Vol 52.
PRQ-L27-28.5		C. Jeffrey Waddoups, Union coverage and work- related training in the construction industry, Industrial & Labor Relations Review, 67(2), April 2014. © by Cornell University.
PRQ-L27-28.6		Samantha Peone, Construction training school expands on West Plains, Journal of Business October 12, 2017.
PRQ-L29-30.1	Lecture 29 and Lecture 30	Mantas Vilkas, Over standardization of organizational processes, ECONOMICS AND MANAGEMENT: Vol 16, 2011.
PRQ-L29-30.2		Guy S. Saffold, Culture Traits, Strength, and Organizational Performance: Moving Beyond "Strong" Culture, Academy of Management Review, 1988, Vol. 13, No. 4.
PRQ-L29-30.3		Judy D. Olman and Sara L. Rynes, Making Total Quality Work: Aligning Organizational Processes, Performance Measures, and Stakeholders, Human Resource Management. Fall 1991, Vol. 30, Number 3, Pp. 303-333.
PRQ-L29-30.4		Anant Mishra, Sidhartha R. Das, James J. Murray, Risk, Process Maturity, and Project Performance: An Empirical Analysis of US Federal Government Technology Projects, Journal of Production and Operations Management, Vol. 25, No. 2, February 2016, pp. 210–232.
PRQ-L29-30.5		Mireille G Battikha, QUALICON: Computer based system for construction quality management, Journal of Construction Engineering and Management / March/April 2002.
PRQ-Assignment01 PRQ-Assignment02		Materials for the purpose of writing the assignments PFMS operation Materials for the purpose of writing the assignments on



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Reading	Reference	Suggested Literature
		project risk assessment analysis.

Subject Coordinator contact details:

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For any query please contact the subject coordinator over phone or email.

**The study materials for the entire subject have been
developed and will be available electronically.**



Smart Villages Lab
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Draft Proposal for New Post Graduate Degree Course Prepared in Line of AICTE Model Curriculum (Circulated in January 2018)

**CURRICULUM AND SYLLABUS
I TO IV SEMESTERS (FULL TIME)**

FOR

MASTER OF CONSTRUCTION MANAGEMENT

IN

**ASSAM ENGINEERING COLLEGE
GUWAHATI-781013**



Introduction:

The All India Board of PG Education and Research in Engineering and Technology of AICTE has reviewed and updated curriculum for various courses and programs in technical education. The focus is fixed to design and develop model curricula at PG level in the light of fast changing technological advancement, new emerging areas and also changes in pedagogy and delivery system in teaching and learning process. The major specializations in each branch of engineering are selected for making model curriculum. The course objectives and course outcomes are made part of the model curriculum to ensure development of specialized knowledge and relevant skill in integrated manner of learning.

A standard academic format common for all PG programmes describing numbers of credits, weight age for lecture, laboratories work and projects have been fixed considering the scope of study. The position and sequence of study of core courses and elective courses are made to ensure sequential and integral learning. The focus on advance study in core courses through theory and laboratories work supported by study on relevant programme specific electives are incorporated. The selection of unique courses in the basket of elective is a special feature of model curricula ensuring flexibility and diversity. The emphasis on understanding advanced concepts of PG course is ensured through elaborate practical work conducted through actual and virtual laboratory experiments. The concept of designing experiments and developing concept application is made part of learning process. The PG course is spread over two years in four semesters and inclusion of mini project, audit courses, open electives and dissertation are the special features of the curriculum. The contents of course are unitised to facilitate its execution. The list of suggested reading is also made part of the curriculum.

The Distinct features of model PG curriculum in Engineering and Technology are listed below:

- Standardized academic structure for all PG Programs with uniform credit distribution.
- Advanced study of specialization through core subjects, flexible and diverse program specific electives.



- Open electives to widen skills.
- Enhanced engagement of industry in developing innovations and problem solutions.
- Collaborating and interactive learning to ensure talent development.
- Inbuilt mechanism for regular up-gradation of curriculum.
- Focus on development of advanced knowledge and specific skills required for industrial development.
- Ensured competency development of learner.

In line of discussion made above, the proposed draft curriculum of Master of Construction Management in Assam Engineering College is presented below:

M. Tech. (Civil Engineering) Specialization: Construction Management
Semester I

Sr. No.	Course Type/Code	Course Name Prepared By	Teaching Scheme			
			L	T	P	C
1	Core I	Construction Materials	2	1	0	3
2	Core II	Building Construction	2	1	0	3
3	Core III	3 R in Construction	2	1	0	3
4	P/Elective I	Construction Waste Management	3	0	0	3
5	P/Elective II	Construction Methods and Equipments	3	0	0	3
6	Audit I	Disaster Management	3	0	0	3
Total						18



Semester II

Sr. No.	Course Type/Code	Course Name Prepared By	Teaching Scheme			
			L	T	P	C
1	Core IV	Building Regulations	2	1	0	3
2	Core V	Contract Management	2	1	0	3
3	Core VI	Fundamentals of Project Management	2	1	0	3
4	P/Elective III	Sustainable Solution to Buildings	3	0	0	3
5	P/Elective IV	Building Services and operations	3	0	0	3
6	Audit II	Stress Management by Yoga	3	0	0	0
Total						18

Semester III

Sr. No.	Course Type/Code	Course Name Prepared By	Teaching Scheme			
			L	T	P	C
1	P/Elective V	Project Procurement	3	0	0	3
2	P/Elective VI	Project Economics and Finance	3	0	0	3
3	Dissertation	Phase – I	0	0	20	10
Total			6	0	10	16

Semester IV

Sr. No.	Course Type/Code	Course Name Prepared By	Teaching Scheme			
			L	T	P	C
1	Dissertation	Phase – II	0	0	32	16
Total			-	-	-	16

Total credits of the PG program 18+18+16+16=68



The list of audit courses is given below. The detailed syllabus of these subjects is available in the AICTE website.

Audit course 1 & 2

1. English for Research Paper Writing
2. Disaster Management
3. Sanskrit for Technical Knowledge
4. Value Education
5. Constitution of India
6. Pedagogy Studies
7. Stress Management by Yoga
8. Personality Development through Life Enlightenment Skills.

List of the courses developed under Smart Assam Project by the visiting scholars from Assam Engineering College is given below:

Sr. No.	Course Type/Code	Course Name	Prepared By
1	Core I	Construction Materials	Dr. B. Talukdar
2	Core II	Building Construction	Dr. B. Talukdar
3	Core III	3 R in Construction	Dr. B. Talukdar Dr. J. Pathak
4	Core IV	Building Regulations	Dr. J. Pathak
5	Core V	Contract Management	Dr. J. Pathak
6	Core VI	Fundamentals of Project Management	Dr. P. Baishya
7	P/Elective I	Construction Waste Management	Dr. P. Baishya
8	P/Elective II	Construction Methods and Equipments	Dr. P. Baishya Dr. S.Bora
9	P/Elective III	Sustainable Solution to Buildings	Dr. S.Bora
10	P/Elective IV	Building Services and operations	Dr. S.Bora
11	P/Elective V	Project Procurement	Dr.S.K.Deb
12	P/Elective VI	Project Economics and Finance	Dr.S.K.Deb
13	P/Elective VII	Project Risk and Quality	Dr.S.K.Deb

TOUR DIARY



Smart Assam Project Construction Management Programme at Assam Engineering College

Tour Diary of Visiting Academic Scholars Dr. Sudip kumar Deb to University of Melbourne, Australia during the period 10th March to 20th April, 2018

Date	Activity	Descriptions
Day 1 : 10th March, 2018, Saturday	En route to Melbourne	Travelling: - Guwahati to Kolkata by Jet airways flight 9W 771(arrived at 4.00PM) - Marketing and Dinner at Kolkata air port.
Day 2: 11st April, 2018, Sunday	En route to Melbourne	Travelling: - Kolkata to Hong Kong by Cathay Pacific CX5169 (at 00.20 AM) - arrived Hong Kong at 6.50 AM (Hong Kong local time) Breakfast at Hong Kong - Hong Kong to Melbourne by Cathay Pacific CX163 (at 10.35 AM Hong Kong local time) - arrived Melbourne at 10.30 PM (Melbourne local time) - Melbourne Airport to apartment (Mantra, 222 Russle Street, Melbourne, 3000). Reached at 11.55 PM.
Day 3 : 12th March 2018, Monday	Went to University of Melbourne (UoM), Melbourne School of Design Building (MSD), Faculty of Architecture, Building and Planning (FABP).	Dr. Hemanta Doloi (Senior Lecturer in Property and Construction Management and Technology, FABP, UoM. Came to meet me at Mantra, 222 Russel Street and took me to University of Melbourne in the second half. The school of design and ABP department was visited by me under the guidance of Dr. H.Doloi. My Staff Identity Card was issued (ID-132055) from HR-FES. As the day was a local holiday, came back to apartment.
Day 4 : 13th March, 2018, Tuesday	Went to Melbourne University.	In the University, following activities were performed - Went to Commonwealth Bank to open account - Communicated with IT section of U of M to get User ID and Password for accessing library. - Spent time in Dr. Doloi's chamber to understand the line of activities to be performed in U of M.
Day 5 : 14th March, 2018 , Wednesday	Went to Melbourne University Introduction to the research team and faculty.	Discussion: Dr. Hemanta Doloi narrated the overall scope for the construction management program at AEC. Reviewed the draft program already prepared by previous four academic scholars from AEC in the last year.



**Smart Assam Project
Construction Management Programme at Assam Engineering College**

Date	Activity	Descriptions
		Briefings on Literature Search for developing subject contents for CM program at AEC.
DAY6 : 15th March, 2018, Thursday	Went to Melbourne University - Discussion with Dr. Hemanta Doloi at the Staff Kitchen and he advised to attend the fortnightly operations meeting of the Assam Project to be held in faculty meeting room in the 3rd floor. - Literature Survey	Discussion with Dr Hemanta Doloi & others - In the meeting, I was introduced by Dr. Doloi and welcomed me in the University of Melbourne. - Dr Dolly reviewed the progress of the Assam Project to all members and discussed the steps to be taken for the proposed International Workshop cum conference to be held in Assam in the month of December 2018. - The meeting was attended by Prof. Ray Green, Prof. Robert Crawford, Mr. Jeff, Sally Maree Donovam, Dr. H.Doloi and Mr. Arup Deka, Ms. Velyine Katharpi (both PhD students under Assam Project), who showed interest in the ensuing conference and delivered responsibility to Dr. H.Doloi to do needful for the conference. Literature Survey Online survey of relevant literature in line with the development of the master's course curriculum of construction management at AEC.
DAY7 : 16th March, 2018, Friday	Went to University of Melbourne Literature Survey	Literature Survey Online survey of relevant literature in line with the development of the master's course curriculum of construction management at AEC.
DAY8 : 17th March, 2018, Saturday DAY9 : 18th March, 2018, Sunday		Leisure



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Date	Activity	Descriptions
DAY10: 19th March, 2018, Monday	Went to University of Melbourne, School of design, Architecture, Building and Planning department. Literature survey	Literature Survey Online survey of relevant literature in line with the development of the master's course curriculum of construction management at AEC.
DAY11: 20th March, 2018, Tuesday	Went to University of Melbourne, School of design, Architecture, Building and Planning department. Literature survey	Literature Survey Online survey of relevant literature in line with the development of the master's course curriculum of construction management at AEC. The course under preparation is Project procurement. Lot of literatures are downloaded to prepare reading materials.
Day12: 21st March, 2018, Wednesday	Went to University of Melbourne, School of design, Architecture, Building and Planning department at 10 AM. - Literature Survey - Spent time in Library.	Literature Survey Online survey of relevant literature in line with the development of the master's course curriculum of construction management at AEC. The subject Project Procurement is being worked out. Vigorous on line search has been carried out to find suitable text book. But, no such good book has been revealed till now. In the second half, I went to Commonwealth Bank to take information regarding the delivery of ATM debit card. No suitable information was obtained. At around, 7-30 PM, I left the ABP department towards apartment.
DAY13: 22nd March, 2018, Thursday	Went to University of Melbourne - Literature survey - Attended discussion with Dr. Hemanta Doloi in the staff canteen at level 4 in Architecture Building and Planning department, University of Melbourne.	Literature Survey: Online survey of relevant literature in line with the development of the master's course curriculum of construction management at AEC. I attended a formal discussion and review meeting of the progress of my work with Dr. Hemanta Doloi. It was held in the staff canteen at level 4 in Architecture Building and Planning department, University of Melbourne. Dr. Doloi appraised the progress of subject Project Procurement. He advised to start next subject as Project Economics and Finance. He has suggested the contents and probable materials to be included in this subject for the benefit of both teacher as well as students.
DAY14:	Went to University of Melbourne	Literature Survey: Online survey of relevant literature in line with the



Smart Assam Project
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Date	Activity	Descriptions
23rd March, 2018, Friday	- Literature Survey - Attended library of Architecture Building Planning department. - Reported to the Assistant of the Commonwealth Bank to get the ATM card. He assured that it will be received after 5 more days.	development of the master's course curriculum of construction management at AEC.
Day15: 24th March, 2018, Saturday	Leisure	
Day16: 25th March, 2018, Sunday		
Day17: 26th March, 2018, Monday	Went to University of Melbourne - Literature survey - Visited Bank at Parkville to know about the ATM debit card issue. - Meeting with Dr. Hemanta Doloi.	Literature Survey Online survey of relevant literature in line with the development of the master's course curriculum of construction management at AEC.
Day18: 27th March, 2018, Tuesday	Went to University of Melbourne - Literature survey. - Attended Dr. Hemanta Doloi's class on Procurement	Literature Survey Online survey of relevant literature in line with the development of the master's course curriculum of construction management at AEC. Visited the library of Architecture Building planning department and observed different models and materials in connection to infrastructure development. In the afternoon, I went to play ground of University of



**Smart Assam Project
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Date	Activity	Descriptions
	Management at 3-30 PM in ABP department.	Melbourne to enjoy a Basket ball match between Monash and UoM.
Day19: 28th March 2018, Wednesday	Went to University of Melbourne, School of design, Architecture, Building and Planning department at 10 AM. - Literature Survey - Spent time in Library.	Literature Survey Online survey of relevant literature in line with the development of the master's course curriculum of construction management at AEC.
Day20: 29th March, 2018, Thursday	Went to University of Melbourne - Attended formal get together on the occasion of Pre Easter at staff canteen at level 4 at 11 AM. - Attended fortnightly operation meeting of Assam Project at 12 Noon in room no 318. - On line literature survey on Project Economics and Finance.	Went to University of Melbourne Formal Pre Easter Get together of Faculties of ABP In staff canteen at 11 AM Attended formal get together on the occasion of Pre Easter at staff canteen at level 4 at 11 AM. Almost all faculties of ABP attended the meeting. A senior lady teacher welcomed all members in the meeting and expressed happiness and good willing on the occasion of Easter. Everybody expressed greetings and wished for a happy week end. The meeting was ended with a cup of tea and cake and lot of chocolates. Fortnightly operation Meeting of Assam project. The meeting was attended by Prof. Ray Green, Mr. Jeff, Sally Maree Donovam, Dr. H.Doloi and Ms. Velyine Katharpi (PhD students under Assam Project). Dr. Doloi welcomed the members in the meeting and discussed the progress of web site preparation for International Conference on Smart Village and Rural Development (COSVART 2018). The conference site prepared by Easy chair will be open in the first week of April 2018. Members were requested to give few name s of internationally reputed scholars to form a global advisory committee of reviewers for the conference. Dr.S.K.Deb, visiting scholar expressed his full satisfaction to work with the Assam project team in University of Melbourne. He also stated the progress of



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Date	Activity	Descriptions
		his work relating preparation of course for starting PG programme in Construction Management in Assam Engineering College. Literature Survey Online survey of relevant literature in line with the development of the master's course curriculum of construction management at AEC.
Day21: 30 th March, 2018, Friday	Today is Good Friday. It is a holiday in University of Melbourne. Leisure. Stayed at residence and did home works.	The University of Melbourne is closed due to Good Friday and Easter. Stayed at apartment and carried out personal work including cleaning, washing and cooking. Also did some task of composing and editing the reading material for the subject under preparation.
Day22: 31 st March, 2018, Saturday	Leisure	
Day23: 01 st April, 2018, Sunday	Leisure	
Day24: 02 nd April, 2018, Monday	Today is Easter Monday. It is a State holiday in Australia. Stayed at residence and carried out work on the course – curriculum preparation.	The University of Melbourne is closed due to Easter Monday. Stayed at apartment and carried out work on the courses which are in progress. Also did some personal work including cleaning, washing and food preparation.
Day25:	Went to University of Melbourne	Meeting with faculty and staff. Dr Hemanta Doloi briefed about the format and style of



Smart Assam Project
Construction Management Programme at Assam Engineering College

Date	Activity	Descriptions
3rd April, 2018, Tuesday	- Meeting with Dr. Hemanta Doloi. - Literature Survey	submitting the courses which are under preparation. He advised to complete the work at least five days before my departure. Literature Survey Online survey of relevant literature in line with the development of the master's course curriculum of construction management at AEC.
Day26: 4th April, 2018, Wednesday	Went to UoM - Literature survey - Went to Library Building to consult previous year's project works. It was also observed various classes having innovative design activities of students on laboratories.	Literature Survey Online survey of relevant literature in line with the development of the master's course curriculum of construction management at AEC.
Day27: 5th April, 2018, Thursday	Went to UoM Meeting with Dr Hemanta Doloi at Staff Canteen.	Discussion: Dr Doloi took stock of the progress made in the development of course curriculum and suggested measures for proper documentation of the work.
Day28: 6th April, 2018, Friday	Went to UoM Meeting with Dr Hemanta Doloi at Staff Canteen	Discussion: Dr Doloi took stock of the progress made in the development of course curriculum and suggested measures for proper documentation of the work. He enquired as to what other facilities can be made available to us for the preparation of the course content.
Day29: 7th April, 2018, Saturday	Leisure	
Day30: 8th April,		



Smart Assam Project
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Date	Activity	Descriptions
2018, Sunday		
Day31: 9th April, 2018, Monday	Went to UoM - Meeting with Dr Hemanta Doloi. - Development of the course curriculum.	Development of the course curriculum Development of the course curriculum is in progress with the help of the faculty of UoM and the materials collected through Literature Survey.
Day32: 10th April, 2018, Tuesday	Went to University of Melbourne - Development of the course curriculum. - Attended Dr. Hemanta Doloi's class. - Attended student's presentation.	Development of the course curriculum Development of the course curriculum is in progress with the help of the faculty of UoM and the materials collected through Literature Survey. The material developed so far was discussed with Dr. Hemanta Doloi. He reviewed the progress and directed to make a draft syllabus /curriculum in line with the latest circulation of AICTE relating Post Graduate courses.
Day33: 11th April, 2018, Wednesday	Went to University of Melbourne - Development of the course curriculum - Meeting with Dr. Hemanta Doloi.	Development of the course curriculum Development of the course curriculum is in progress with the help of the faculty of UoM and the materials collected through Literature Survey.
Day34: 12th April, 2018, Thursday	Went to University of Melbourne - Development of the course curriculum - Fortnightly operation Meeting of Smart Village Project with Dr. Hemanta Doloi and others.	Development of the course curriculum Development of the course curriculum is in progress with the help of the faculty of UoM and the materials collected through Literature Survey. The fortnightly operation meeting of Assam Project was held at 11 AM to 12 Noon. The meeting was attended by Dr. H.Doloi, Dr. Sally Donovan, Dr. Robert Crawford, Dr. Geoff Kimm, Mr. Arup Deka, Ms. Velyne Katharpi, Dr. Mark Burry. The meeting discussed thoroughly the progress of COSVARD 2018. Dr. Doloi presented a detailed progress report of the conference to be held in the month of December 2018 in India. The meeting also discussed the progress of work of Dr. S.K.Deb. The



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Date	Activity	Descriptions
		members expressed satisfaction over the progress of work.
Day 35: 13th April, 2018, Friday	Went to University of Melbourne - Development of the course curriculum - Meeting with Dr. Hemanta Doloi.	Development of the course curriculum Development of the course curriculum is in progress with the help of the faculty of UoM and the materials collected through Literature Survey. The work prepared was rechecked finally along with Do. Hemanta Doloi and made necessary minor correction. Dr. H Doloi advised to complete the draft syllabus in line with AICTE.
Day 36: 14th April, 2018, Saturday	Leisure	
Day 37: 15th April, 2018, Sunday		
Day 38: 16th April, 2018, Monday	Went to University of Melbourne - Development of the course curriculum - Meeting with Dr. Hemanta Doloi.	Development of the course curriculum Development of the course curriculum is in progress with the help of the faculty of UoM and the materials collected through Literature Survey.
Day 39: 17th April, 2018, Tuesday	Went to University of Melbourne Development of the course curriculum	Development of the course curriculum Development of the course curriculum is in progress with the help of the faculty of UoM and the materials collected through Literature Survey. The draft syllabus of the proposed construction Management in line with AICTE was discussed with Dr. H Doloi.
Day 40: 18th April, 2018, Wednesday	Went to University of Melbourne Final scrutiny and revision of the subject under proposed Course curriculum and syllabus.	Final scrutiny of the course curriculum developed Scrutiny of the course curriculum developed for the Construction Management program at Assam Engineering College is started jointly for submission to UoM for review and its publication.



Smart Assam Project
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Date	Activity	Descriptions
	Meeting with Dr. Hemanta Doloi.	
Day 41: 19th April, 2018, Thursday	Went to University of Melbourne - Final scrutiny and revision of the subject under proposed Course curriculum and syllabus. - Meeting with Dr. Hemanta Doloi.	Submission of Course Curriculum outline The course curriculum of 3 subjects (i.e. Project Procurement, Project Economics and Finance, and Project Risk and Quality) to be included in the Construction Management course at Assam Engineering College has been developed and submitted to Dr Hemanta Doloi and Dr Ray Green.
Day 42: 20th April, 2018, Friday	Went to University of Melbourne - Submission of Course Curriculum outline - Meeting with Dr. Hemanta Doloi. - Brief discussion with Dr. Ray Green	Submission of Course Curriculum outline The course curriculum of 3 subjects (i.e. Project Procurement, Project Economics and Finance, and Project Risk and Quality) prepared by Dr. S.K.Deb is approved for its publication and submission to the concerned authority of the Government of Assam. All faculty members of the ADP department were met by Dr. S.K.Deb and expressed thanks for their kind cooperation and needful help during the period of visit in the University of Melbourne from 12.3.18 to 20.4.18.
Day 43: 21st April, 2018, Saturday	Dr. Sudip Kumar Deb left for Guwahati.	At the end of six weeks academic scholar visit in the University of Melbourne, Dr. S.K.Deb left for Guwahati by CX 134(Cathay Pacific) at 07-05 Hrs.

