Pimpri Chinchwad Education Trust's

PIMPRI CHINCHWAD COLLEGE OF ENGINEERING

SECTOR NO. 26, PRADHIKARAN, NIGDI, PUNE 411044

An Autonomous Institute Approved by AICTE and affiliated to SPPU, Pune

Curriculum Structure and Detailed Syllabus

S.Y. M. Tech. Construction Management

(Approved by Civil Engineering BoS)

(Course 2020)

DEPARTMENT OF CIVIL ENGINEERING

Effective from Academic Year 2021-22

Institute Vision

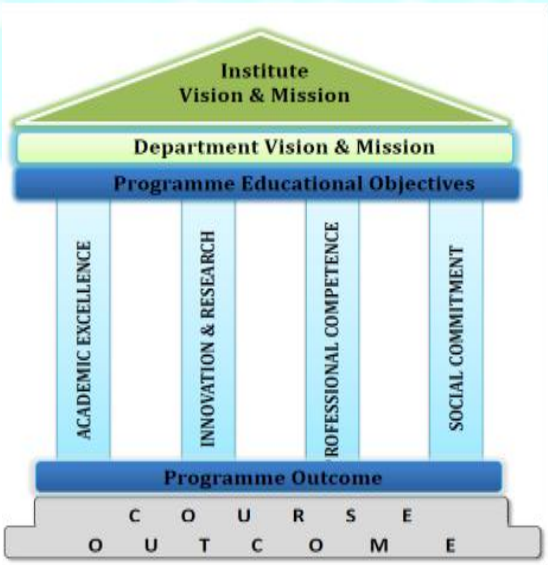
To Serve the Society, Industry and all the Stakeholders through the **Value-Added Quality Education.**

Institute Mission

To serve the needs of society at large by establishing State-of-the-Art Engineering, Management and Research Institute and impart attitude, knowledge and skills with quality education to develop individuals and teams with ability to think and analyze right values and self-reliance.

Quality Policy

We at PCCOE are committed to impart Value Added Quality Education to satisfy the applicable requirements, needs and expectations of the Students and Stakeholders. We shall strive for academic excellence, professional competence and social commitment in fine blend with innovation and research. We shall achieve this by establishing and strengthening state-of-the-art Engineering and Management Institute through continual improvement in effective implementation of Quality Management System.



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CURRICULUM FRAMEWORK (2020-2021; 2021-2022)

❖ The M.Tech. Program is the based on the following type of course:

M.Tech. Civil (Construction Management)

SR. NO.	TYPE OF COURSE	ABBREVATION
1.	Professional Core Course	PCC
2.	Professional Elective Course	PEC
3.	Open Elective Course	OEC
4.	Project	PROJ
5.	Seminar	SEM
6.	Internship	INTR
7.	Humanities / Social Science / Management Course	HSMC
8.	Audit Course	Audit
9.	Massive Open Online Courses	MOOC

❖ The Course and Credit Distribution is as under,

SR. No.	TYPE OF COURSE	NO. OF COURSES	TOTAL CREDITS	
			NO.	%
1.	Professional Core Course (PCC)	8	18	26.4
2.	Professional Elective Course (PEC)	6	14	20.5
3.	Open Elective Course (OEC)	2	4	6
4.	Project (PROJ)	3	25	36.6
5.	Seminar (SEM)	1	2	3
6.	Internship (INTR)	1	2	3
7.	Humanities / Social Science / Management Course (HSMC)	1	1	1.5
8.	Audit Course (AUDIT)	2	-	-
9.	Massive Open Online Courses (MOOC)	1	2	3
	TOTAL	**25**	**68**	**100**

COURSE DISTRIBUTION : SEMESTER WISE						
Sr. No.	**TYPE OF COURSE**	**NO. OF COURSES/ SEMESTER**				**TOTAL**
		1	**2**	**3**	**4**	
1.	Professional Core Course (PCC)	5	3	-	-	**8**
2.	Professional Elective Course (PEC)	3	3	-	-	**6**
3.	Open Elective Course (OEC)	1	1	-	-	**2**
4.	Project (PROJ)	-	1	1	1	**3**
5.	Seminar (SEM)	-	-	1	-	**1**
6.	Internship (INTR)	-	-	1	-	**1**
7.	Humanities / Social Science / Management Course (HSMC)	-	1	-	-	**1**
8.	Audit Course (AUDIT)	1	1	-	-	**2**
9.	Massive Open Online Courses (MOOC)	-	-	1*	1	**1**
	TOTAL	**10**	**10**	**3**	**2**	**25**

* MOOCs is optional with Internship

CREDIT DISTRIBUTION : SEMESTER WISE						
1 Lecture hour = 1 Credit 2 Lab Hours = 1 Credit 1 Tutorial Hour = 1 Credit						
Sr. No.	**TYPE OF COURSE**	**NO. OF CREDITS/ SEMESTER**				**TOTAL**
		1	**2**	**3**	**4**	
1.	Professional Core Course (PCC)	11	7	-	-	18
2.	Professional Elective Course (PEC)	7	7	-	-	14
3.	Open Elective Course (OEC)	2	2	-	-	4
4.	Project (PROJ)	-	3	10	12	25
5.	Seminar (SEM)	-	-	2	-	2
6.	Internship (INTR)	-	-	(2)*	-	(2)
7.	Humanities / Social Science / Management Course (HSMC)	-	1	-	-	1
8.	Audit Course (AUDIT)	-	-	-	-	-
9.	Massive Open Online Courses (MOOC)	-	-	(2)*	2	2
	TOTAL	**20**	**20**	**14**	**14**	**68**

* MOOCs is optional with Internship

LIST OF ABBREVIATIONS

Abbreviations	Course Full Name
PCC	Professional Core Course
PEC	Professional Elective Course
OEC#	Open Elective Course
PROJ	Project, Mini / Minor Projects, Integrated Projects
SEM	Seminar
INTR	Internship
HSMC*	Humanities / Social Science / Management Course
AUDIT*	Audit Course
MOOC	Massive Open Online Courses
H	Hours

Note : * Indicates that these courses are at institute level

 # The Course offered by the other department

CURRICULUM STRUCTURE

STRUCTURE FOR 1ST YEAR M. TECH (CIVIL- CONSTRUCTION MANAGEMENT)

SEMESTER – I

M. Tech. Construction Management			Teaching Scheme				Examination Scheme					
Course Code	**Course Type**	**Course Name**	**L**	**P**	**H**	**CR**	**IE1**	**IE2**	**ETE**	**TW**	**OR**	**Total**
MCI1401	PCC	Research Methodology & IPR	3	-	3	3	20	30	50	-	-	100
MCI1402	PCC	Project Planning and Management in Construction (PPMC)	3	-	3	3	20	30	50	-	-	100
MCI1403	PCC	Construction Technology (CT)	3	-	3	3	20	30	50	-	-	100
MCI1404	PEC	Professional Core Lab-I	-	2	2	1	-	-	-	50	50	100
MCI1501	PEC	Professional Elective-I	3	-	3	3	20	30	50	-	-	100
MCI1502	PEC	Professional Elective-II	3	-	3	3	20	30	50	-	-	100
MCI1503	PEC	Professional Elective Lab-I	-	2	2	1	-	-	-	50	50	100
*****	OEC	Open Elective-I	2	-	2	2	20	-	30	-	-	50
MCI1405	PCC	Skill Development Lab – I (Software Skill)	-	2	2	1	-	-	-	50	-	50
M1961	Audit	Audit Course – I	1	-	1	-	-	-	-	-	-	-
		Total	**18**	**6**	**24**	**20**	**120**	**150**	**280**	**150**	**100**	**800**

STRUCTURE FOR 1ST YEAR M. TECH (CIVIL- CONSTRUCTION MANAGEMENT)

SEMESTER – II

M. Tech. Construction Management			Teaching Scheme				Examination Scheme					
Course Code	**Course Type**	**Course Name**	**L**	**P**	**H**	**CR**	**IE1**	**IE2**	**ETE**	**TW**	**OR**	**Total**
MCI2405	PCC	Construction Contracts Administration and Management (CCAM)	3	-	3	3	20	30	50	-	-	100
MCI2406	PCC	Project Economics and Financial Management (PEFM)	3	-	3	3	20	30	50	-	-	100
MCI2407	PCC	Professional Core Lab-II	-	2	2	1	-	-	-	50	50	100
MCI2504	PEC	Professional Elective-III	3	-	3	3	20	30	50	-	-	100
MCI2505	PEC	Professional Elective-IV	3	-	3	3	20	30	50	-	-	100
MCI2506	PEC	Professional Elective Lab –II	-	2	2	1	-	-	-	50	50	100
*****	OEC	Open Elective –II	2	-	2	2	20	-	30	-	-	50
MCI2101	HSMC	Skill Development Lab – II (Oral & Written Communication)	-	2	2	1	-	-	-	50	-	50
MCI2701	PROJ	Integrated Mini-Project	-	6	6	3	-	50	-		50	100
M2962	Audit	Audit Course –II	1	-	1	-	-	-	-	-	-	-
		Total	**15**	**12**	**27**	**20**	**100**	**170**	**230**	**150**	**150**	**800**

Abbr: Course Abbreviation; **L**- Lecture; **P**- Practical; **H**- Hours; **CR**- Credits; **IE1** – Internal Evaluation-1; **IE2** – Internal Evaluation-2; **ETE** – End Term Examination; **TW** – Term Work; **OR** – Oral Exam

**** Open Elective code depends upon the subject selection by the student.***

STRUCTURE FOR IIND YEAR M. TECH (CIVIL- CONSTRUCTION MANAGEMENT)

SEMESTER-III

M Tech. C.M.	Sem – III		TEACHING SCHEME				EXAMINATION SCHEME					
Course Code	**Course Type**	**Courses**	**L**	**P**	**H**	**CR**	**IE-1**	**IE-2**	**ETE**	**TW**	**OR**	**TOTAL**
MCI3702	PROJ	Dissertation Phase - I[Company/ In-house project]	-	20	20	10	100	-	-	-	100	200
MCI3703	SEM	Seminar	-	04	04	02	-	-	-	50	50	100
MCI3801	INTR	Internship[Company /Inhouse project]	-	04	04	02	50	-	-	-	50	100
		OR										
MCI3981	MOOC	MOOCs/ Entrepreneurship	-	04	04	02	50	-	-	-	50	100
		Total	**-**	**28**	**28**	**14**	**150**	**-**	**-**	**50**	**200**	**400**

*Internship**: -It may be in summer/winter vacation or within semester at least for three months, evaluation after fourth semester**

SEMESTER-IV

M. Tech. C.M.	Sem – IV		TEACHING SCHEME				EXAMINATION SCHEME					
Course Code	**Course Type**	**Courses**	**L**	**P**	**H**	**CR**	**IE-1**	**IE-2**	**ETE**	**TW**	**OR**	**TOTAL**
MCI4704	PROJ	Dissertation Phase – II [Company/ In-house project]	-	24	24	12	200	-	-	-	200	400
MCI4982	MOOC	MOOCs	-	4	4	2	50	-	-	-	50	100
		Total	**-**	**28**	**28**	**14**	**250**	**-**	**-**	**-**	**250**	**500**

Abbr: Course Abbreviation; **L**- Lecture; **P**- Practical; **H**- Hours; **CR**- Credits; **IE-I** – Internal Evaluation-1; **IE-II** – Internal Evaluation-II; **ETE** – End Term Examination; **TW** – Term Work; **OR** – Oral Exam

PROFESSIONAL ELECTIVE COURSES

Course Code	Elective-I	Course Code	Elective-II
MCI1501A	Sustainable Construction Materials	MCI1502A	Building Services and Maintenance
MCI1501B	Disaster Management	MCI1502B	Value Engineering and Valuation
MCI1501C	Material Management	MCI1502C	Human Resources and Management

Course Code	Elective-III	Course Code	Elective-IV
MCI2504A	Retro Fitting	MCI2505A	Safety Practices in Construction
MCI2504B	Advanced Construction Technology	MCI2505B	Infrastructural Development
MCI2504C	Construction Equipment's and Management	MCI2505C	International Contracting

LIST OF OPEN ELECTIVES

OFFERED BY CIVIL- CONSTRCTION MANAGEMENT

Course Code	Open Elective – I	Course Code	Open Elective –II
MCI1601A	Project Management and Finance	MCI2602A	Contracts, Tendering and Arbitration
CI1601B	Green Technology	MCI2602B	Total Quality Management
		MCI2602C	Operation Research

Course Syllabus

SYLLABUS CONTENT WITH TEACHING AND EVALUATION SCHEME

Course Syllabus

Semester-III

Program:	M. Tech (Civil) Construction Management			Semester :	III	
Course :	Dissertation Phase – I [Company/ In-house project]			Code :	MCI3702	
Teaching Scheme			Evaluation Scheme			
Practical	Hours	Credit	IE-I	PR	OR	Total
20	20	10	100	--	100	200

Essentials:

1. The knowledge acquired by the students through seminar and project at bachelor engineering program.
2. The knowledge acquired by the student from all theory courses and laboratory work done in Sem I and Sem II in first year M.Tech.

Objectives:

1. To develop innovative and research oriented applied work which contribute to the needs of the society.
2. To provide an opportunity of planning, designing and developing complete system or subsystem in the area of construction management and technology, where the students like to acquire specialized skills.
3. To inculcate research culture in students for their technical growth.

Outcomes: After learning the course the students should be able to:

1. Identify and define a problem statement.
2. Critically evaluate literature in chosen area of research and define (establish) scope of work.
3. Develop research methodology.
4. Carryout theoretical study and / or experimental work to demonstrate technical competency.
5. Prepare technical report for research article / copy right / IPR.
6. Develop solution for the benefit of society and environment.

Guidelines :

1. Individual student should carry out project work/ dissertation work under the supervision of allocated guide in the concerned Department.
2. Sponsored Project or Project Internship is acceptable considering postgraduate scope. A candidate may however, in certain cases, be permitted to work on the project in an Industrial/Research Organization, on the recommendation of Head of the Department, with the approval of the Head of the Institution. In such cases, the project work shall be jointly supervised by a supervisor of the Department and an Engineer / Scientist from the organization and the student shall be instructed to meet the supervisor periodically and to attend the review committee meetings for evaluating the progress.
3. Students have to select a topic for the dissertation, based on his/her interest and available facilities at the commencement of dissertation work.
4. Dissertation work may cover analytical formulation, experimentation or survey based project or combination of these and can also undertake an interdisciplinary type project.
5. Student should present the Synopsis Submission Presentation with literature survey report to justify the research gap, innovativeness, applicability, relevance and significance of the work. Student should undertake project work after approval of synopsis.
6. Students are required to search, collect and review sufficient research articles published in chosen area of research from peer reviewed journals.
7. Student should complete the dissertation phase-I work that will consist of problem statement, literature review: project overview, scheme of implementation (Mathematical Model/block diagram/PERT chart, etc.) and layout & design of setup if any.
8. Student should submit a dissertation phase-I report on the research work carried out by him/her as a compliance of term work associated with course.
9. Dissertation phase-I presentation and oral will be based on preliminary results from his/her work during the semester with report.
10. It is expected to submit the project and plagiarism report within 30 days from the last day of end of semester in which dissertation work is done.

11. For non-satisfactory performance, student will be given grace period of 2 weeks. After 2 weeks student will be again evaluated with grade penalty.
12. Minimum 02 presentations should be delivered by the student during semester.
13. Paper publication is expected as research outcome of dissertation phase-I (Conference or reputed journal) and 40% of planned project work should be completed for submission of Dissertation Phase-I.
14. Total 120 hours are expected to be spend by students to satisfy all project requirements and implementations.

Detailed Syllabus:

Dissertation Phase – I [Company/ In-house project]

Sr. No.	Activity	Duration (Hrs)
1.	**Week 1, 2 & 3**: Guide allotment, applying for sponsorship and project internship, finalization of topic, Planning of work and required tools. **Review 1** for Title finalization.	**30**
2.	**Week 4 & 5**: Literature collection, Specification and Methodology Finalization, **Review 2** for Literature Analysis and specification.	**20**
3.	**Week 6, 7 & 8**: Detail literature review, planning of the necessary tools/resources for implementation and/or related software,	**30**
4.	**Week 9 & 10**: Finalization of scheme of implementation (Mathematical Model/block diagram/chart, etc.) and layout & Design of experimental setup if any. Survey, data collection planning. **Review 3** to understand the progress of the work.	**20**
5.	**Week 11 & 12**: Project Report writing / copyright.	**20**
	Total	**120**

Program:	M. Tech (Civil) Construction Management				Semester:	III
Course:	Seminar				Code:	MCI3703
Teaching Scheme			Evaluation Scheme			
Practical	Hours	Credit	PR	TW	OR	Total
4	4	2	--	50	50	100

Objectives:

1. To work on a specific technical topic in Construction Management and technology, in order to acquire the skills for technical communication.
2. To acquire technical writing abilities for seminars and conferences.

Outcomes: After learning the course the students should be able to:

1. Identify and define a problem statement.
2. Evaluate literature in chosen area of research and define (establish) scope of work.
3. Develop research methodology for seminar work.
4. Prepare technical report.

Guidelines:

1. Individual student need to study recent topics in the field of Construction Management under the guidance of allocated guide.

2. Students can choose topic related to Construction Management, considering recent trends and its societal importance.

3. The extensive Literature Survey, Mathematical Modeling of particular method, experimentation and valuable conclusion is expected from seminar study.

4. Seminar Report should be submitted as a compliance of term work.

5. Technical paper publication is expected as outcome of seminar.

6. Total Duration: 24 Contact Hours and additional 24 Hours should be spend by students on completion of related activities and requirements.

Detailed Syllabus:

Seminar Activities

Sr. No.	Activity	Duration (Hrs)
1.	**Week 1, 2 & 3**: Guide allotment, finalization of topic, Planning of the work. **Review-1** conduction	6
2.	**Week 4 & 5**: Literature review, Specification and Methodology Finalization, of detail topic.	4
3.	**Week 6, 7 & 8**: Detail Topic Mathematical model, Experimentation methodology and findings. **Review-2** conduction	6
4.	**Week 9 & 10**: Comparison of detail topic with other existing methods.	4
5.	**Week 11 & 12**: Seminar Report writing and publication or copyright planning **Final Review** conduction.	4
	Total	24

Program:	M. Tech (Civil) Construction Management			Semester:	III	
Course:	Internship [Company / In-house]			Code:		MCI3801
Teaching Scheme			Evaluation Scheme			
Practical	Hours	Credit	IE1	TW	OR	Total
4	4	2	50	--	50	100

Guidelines:

1. Individual student should attempt for internship with help of PCCOE T&P cell / T&P departmental coordinator in the **Construction Management domain** under the guidance of internship coordinator.
2. The presentation is expected from the students based on their internship work.
3. Internship report should be submitted as a compliance of term work associated with subject.
4. Total Duration: 24 Contact Hours and additional 24 Hours should be spend by students on completion of related activities and requirements.

Detailed Syllabus:

Internship/ In-house / Entrepreneurship activity

Sr. No.	Activity	Duration (Hrs)
1	**Week 1, 2 and 3**: Guide allotment, Application of internships, finalization of topic, Planning of the work. **Review-1** conduction	6
2	**Week 4 & 5**: Internship/ Mini-project/ Entrepreneurship activity implementation as per requirements	4
3	**Week 6 to 8**: **Review-2** of Activities	6
4	**Week 9 & 10**: Interaction of Guides with Industry, Presentation	4
5	**Week 11 & 12**: Internship Report writing, **Final Review** conduction.	4
	Total	24

Program:	M. Tech (Civil) Construction Management			Semester:	III	
Course:	MOOCs/ Entrepreneurship			Code:		MCI3981
Teaching Scheme			Evaluation Scheme			
Practical	Hours	Credit	IE1	TW	OR	Total
4	4	2	50	--	50	100

Guidelines :

1. Individual student need to register for MOOC course of their interest or entrepreneurship related trainings.
2. Weekly assignment needs to be regularly completed as per requirement of course, which will be considered for internal assessment of course.
3. The certification of course or training is mandatory.
4. Oral and presentation of course/ training will be taken at the end of semester by internal / external examiner.
5. Total Duration: 24 Contact Hours and additional 24 Hours should be spend by students on completion of related activities and requirements.

Course Syllabus

Semester-IV

Program:	**M. Tech. (Civil) Construction Management**				**Semester :**	**IV**
Course:	Dissertation Phase – II [Company/ In-house project]				**Code :**	**MCI4704**
Teaching Scheme			**Evaluation Scheme**			
Practical	**Hours**	**Credit**	**IE-I**	**PR**	**OR**	**Total**
24	24	12	200	--	200	400

Essentials:

1. The knowledge acquired by the students through seminar and project at bachelor engineering program.
2. The knowledge acquired by the student from all theory courses and laboratory work done in Sem I and Sem II in first year M. Tech.

Objectives:

1. To develop innovative and research oriented applied work which contribute to the needs of the society.
2. To provide an opportunity of planning, designing and developing complete system or subsystem in the area of construction management and technology, where the students like to acquire specialized skills.
3. To inculcate research culture in students for their technical growth.

Outcomes: After learning the course the students should be able to:

1. Identify and define a problem statement.
2. Evaluate literature in chosen area of research and define (establish) scope of work.
3. Develop research methodology.
4. Carryout theoretical study and / or experimental work to demonstrate technical concepts.
5. Prepare technical report for copy right, IPR and research article.
6. Develop solution for the benefit of society and environment.

Guidelines :

1. The student should complete the remaining major part of the project in this semester IV, which will consist of the experimental set up and analysis required for the project or software based analysis, validation of results and conclusions.
2. The student should prepare the duly certified final report of the project work in standard format within 30 days after end of the last day of semester IV.
3. Final Project Report should be submitted as a compliance of term work associated with course.
4. For non-satisfactory performance, student will be given grace period of 4 weeks. After 4 weeks student will be again evaluated with grade penalty.
5. If a candidate fails to submit the dissertation on or before the specified deadline, he / she is deemed to have incomplete dissertation and should re-register for the same in subsequent semester.
6. Student should present / publish minimum 1 research paper in peer reviewed conference/research journals as research outcome of Dissertation Phase – II (Conference or reputed journal) and 100% of planned project work should be completed for submission of Dissertation Phase-II
7. Total Duration: 144 hours are contact hours with guides and for reviews , 144 hours are expected to be spend by students to satisfy all project requirements and implementations.

Detailed Syllabus:

Dissertation Phase – II

Sr. No.	**Activity**	**Duration (Hrs)**
1.	**Week 1 & 2**: Experimental set up required for the project, Experimental or software analysis etc. completed	**48**
2.	**Week 3 & 4**: 60 % Work should be completed. Progress **Review 1** conduction.	**48**
3.	**Week 5 & 6**: 80% work should be completed. Taking results, analysis and validation of results.	**48**
4.	**Week 7 & 8**: Compliance of 100 % work. Progress **Review -2** will be conducted to check the quality of project and requirements fulfillment to permit project submission.	**48**

5.	**Week 9 & 10**: Paper writing and report writing should be in process	**48**
6.	**Week 11 & 12**: Project Report writing, patent and copyright planning and execution. Demonstration of Project work and **Final Research Review** Committee (RRC) reviews will be conducted for submission and term work compliances.	**48**
	Total	**288**

Program:	**M. Tech (Civil) Construction Management**				**Semester:**	**IV**
Course:	MOOCs/ Entrepreneurship				**Code:**	**MCI4982**
Teaching Scheme			**Evaluation Scheme**			
Practical	**Hours**	**Credit**	**IE1**	**TW**	**OR**	**Total**
4	4	2	50	--	50	100

Guidelines :

1. Individual student need to register for MOOC course of their interest or entrepreneurship related trainings.
2. Weekly assignment needs to be regularly completed as per requirement of course, which will be considered for internal assessment of course.
3. The certification of course or training is mandatory.
4. Oral and presentation of course/ training will be taken at the end of semester by internal / external examiner.
5. Total Duration: 24 Contact Hours and additional 24 Hours should be spend by students on completion of related activities and requirements.

VISION AND MISSION OF CIVIL ENGINEERING DEPARTMENT

Vision

To be recognized as one of the leading department in respect of professional education and innovation in the western region.

Mission

To develop a multidisciplinary approach to relate civil engineering challenges to social and human context through team spirit, right attitude, morals and higher education.

Program Outcomes

1. An ability to independently carry out research /investigation and development work to solve practical problems in construction.

2. An ability to write and present a substantial technical report/document

3. Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program

Program Specific Outcomes

1. The engineers will be able to apply construction technology and management skills to identify and resolve real time organizational and technological problems in construction project.
2. The engineers will be able to demonstrate project management skills required for Civil Engineering entrepreneur.
3. The engineer will be able to utilize and develop innovative tools for construction management discipline.

Higher Study Scope: PhD. Research Centre at PCCOE.

- Computer Engineering
- E&TC Engineering
- Mechanical Engineering

Features of PhD Research Centers

- Experienced Research Guides
- Separate Research Laboratories, Library, licensed software, recent hardware and other Facilities
- Good support for Publications.
- Justified and clear evaluation systems
- Defined rules and regulations for evaluation and submission.
- Effective Course work conductions