



### Criterion 1 – Curricular Aspects

<b>Key Indicator</b>	1.2	<b>Academic Flexibility</b>
<b>Metric</b>	1.2.2	Percentage of Programmes in which Choice Based Credit System (CBCS)/elective course system has been implemented (Data for the latest completed academic year)

### DEPARTMENT OF CIVIL ENGINEERING STRUCTURE OF THE PROGRAM CLEARLY INDICATING COURSES, CREDITS/ELECTIVES

1. B.Tech Civil Engineering(Full Time)
2. B.Tech Civil Engineering(Part Time)
3. M.Tech Environmental Engineering(Full Time)
4. M.Tech Environmental Engineering(Part Time)

## 1. B.Tech- Civil Engineering (Full Time)

### REGULATIONS – 2018

#### SEMESTER I

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XMA101	BSC	Calculus and Linear Algebra	3	1	0	4
XES102	MAN	Environmental Sciences	2	0	0	0
XBE103	ESC	Electrical and Electronics Engineering Systems	3	1	1	5
XAP104	BSC	Applied Physics for Engineers	3	1	4	6
XEG105	ESC	Engineering Graphics	2	1	0	3
<b>TOTAL</b>			<b>13</b>	<b>4</b>	<b>6</b>	<b>18</b>

#### SEMESTER II

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XMA201	BSC	Calculus, Ordinary Differential Equations and Complex Variables	3	1	0	4
XCP202	ESC	Programming for Problem Solving	3	0	4	5
XGS203	HSM	English	2	0	2	3
XAC204	BSC	Applied Chemistry for Engineers	3	1	2	5
XWP205	ESC	Workshop Practices	1	0	4	3
<b>TOTAL</b>			<b>12</b>	<b>2</b>	<b>12</b>	<b>20</b>

**SEMESTER III**

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XCE301	BSC	Transforms and Computational Techniques	2	0	0	2
XCE302	PCC	Disaster Preparedness & Planning	1	1	0	2
XCE303	ESC	Computer Aided Civil Engineering Drawing	1	0	3	3
XCE304	ESC	Engineering Mechanics	3	1	0	4
XCE305	ESC	Energy Science and Engineering	1	1	0	2
XCE306	PCC	Surveying – I	2	0	2	3
XCE307	HSM	Introduction to Civil Engineering	3	0	0	3
XGS308	HSM	Effective Technical Communication	3	0	0	3
XCE309		In-plant Training - I	0	0	2	0
XCEM0*		Minor Course - I	1	0	1	0
<b>TOTAL</b>			<b>17</b>	<b>3</b>	<b>8</b>	<b>22</b>

**SEMESTER IV**

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XCE401	ESC	Mechanical Engineering	2	1	0	3
XCE402	PCC	Instrumentation & Sensor Technologies for Civil Engineering Applications	2	0	2	3
XCE403	PCC	Engineering Geology	1	0	2	2
XCE404	PCC	Mechanics of Fluids	2	0	2	3
XCE405	PCC	Mechanics of Solids	2	0	2	3
XUM406	HSM	Entrepreneurship Development	3	0	0	0
XCE407	PCC	Geotechnical Engineering	2	0	2	3
XCE408	PCC	Surveying – II	2	0	2	3
XCE409	PCC	Materials Testing & Evaluation	2	0	2	3
<b>TOTAL</b>			<b>18</b>	<b>1</b>	<b>14</b>	<b>23</b>

**SEMESTER V**

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XCE501	PCC	Mechanics of Materials	3	0	0	3
XCE502	PCC	Hydraulic Engineering	2	0	2	3
XCE503	PCC	Structural Analysis	2	1	0	3
XCE504	PCC	Hydrology & Water Resources Engineering	2	2	0	3
XCE505	PCC	Environmental Engineering	2	0	2	3
XUM506	HSM	Constitution of India	2	0	0	0
XCE507	PCC	Transportation Engineering	2	0	2	3
XCE508	PCC	Construction Engineering & Management	2	1	0	3
XMG509	HSM	Professional Practice, Law & Ethics	2	0	0	2
XCE510		In-plant Training - II	0	0	2	0
XCEM0*		Minor Course – II	1	0	1	0
<b>TOTAL</b>			<b>19</b>	<b>4</b>	<b>9</b>	<b>23</b>

**SEMESTER VI**

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XCE601	PCC	Structural Engineering	2	1	0	3
XCE602	PCC	Engineering Economics, Estimation & Costing	2	1	4	5
XCEE**	PEC	Elective-I	3	0	0	3
XCEE**	PEC	Elective-II	3	0	0	3
XCEE**	PEC	Elective-III	3	0	0	3
XCEE**	PEC	Elective-IV	3	0	0	3
	OEC	Open Elective-I	3	0	0	3
<b>TOTAL</b>			<b>19</b>	<b>2</b>	<b>4</b>	<b>23</b>

**EMESTER VII**

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XCEE**	PEC	Elective V	3	0	0	3

XCEE**	PEC	Elective-VI	3	0	0	3
XCEE**	PEC	Elective VII	3	0	0	3
	OEC	Open Elective-II	3	0	0	3
XCE705	Project	Project Phase – I	0	0	8	4
XCE706		In--plant Training - III	0	0	4	2
XCEM0*		Minor Course – III	0	0	0	0
<b>TOTAL</b>			<b>12</b>	<b>0</b>	<b>12</b>	<b>18</b>

### SEMESTER VIII

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XCEE**	PEC	Elective VIII	2	0	0	2
	OE	Open Elective-III	3	0	0	3
	OE	Open Elective-IV	3	0	0	2
XCE804	Project	Project Phase– II	0	0	12	6
<b>TOTAL</b>			<b>11</b>	<b>0</b>	<b>12</b>	<b>16</b>

**TOTAL CREDITS - 160**

### PROFESSIONAL ELECTIVE COURSE TRACKS- CIVIL ENGINEERING [PEC-CE]

The following Seven Mandatory Professional Specialized Tracks identified to offer electives.

Track	Professional Coré Courses (PCC-CE)
I.	Transportation Engineering
II.	Structural Engineering
III.	Geotechnical Engineering
IV.	Hydraulics
V.	Structural Engineering
VI.	Hydrology & Water Resources Engineering
VII.	Construction Engineering & Management
VIII.	Environmental Engineering

### Track I

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XCEE01	PEC	Pavement Design	3	0	0	3
XCEE02	PEC	Airport Planning and Design	3	0	0	3
XCEE03	PEC	Port and Harbour Engineering	3	0	0	3
XCEE04	PEC	Railway Engineering	3	0	0	3

### Track II &Track V

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XCEE05	PEC	Advanced Structural Analysis	3	0	0	3
XCEE06	PEC	Design of Concrete Structures	3	0	0	3
XCEE07	PEC	Concrete Technology	3	0	0	3
XCEE08	PEC	Design of Steel Structures	3	0	0	3
XCEE09	PEC	Prestressed Concrete Structures	3	0	0	3
XCEE10	PEC	Bridge Engineering	3	0	0	3

### Track III

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XCEE11	PEC	Foundation Engineering	3	0	0	3
XCEE12	PEC	Environmental Geotechnology	3	0	0	3
XCEE13	PEC	Geotechnical Design	3	0	0	3
XCEE14	PEC	Earthquake Engineering	3	0	0	3

### Track IV

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XCEE15	PEC	Design of Hydraulic Structures	3	0	0	3
XCEE16	PEC	Basics of Computational Hydraulics	3	0	0	3
XCEE17	PEC	Urban Hydrology and Hydraulics	3	0	0	3
XCEE18	PEC	Groundwater Engineering	3	0	0	3

### Track VI

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XCEE19	PEC	Water Quality Engineering	3	0	0	3
XCEE20	PEC	Surface Hydrology	3	0	0	3
XCEE21	PEC	Environmental Fluid Mechanics	3	0	0	3
XCEE22	PEC	Water Resources Field Methods	3	0	0	3

### Track VII

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XCEE23	PEC	Repairs and Rehabilitation of Structures	3	0	0	3
XCEE24	PEC	Building Construction Practice	3	0	0	3
XCEE25	PEC	Construction Equipment and Automation	3	0	0	3
XCEE26	PEC	Contracts Management	3	0	0	3

### Track VIII

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XCEE27	PEC	Environmental Law and Policy	2	0	0	2
XCEE28	PEC	Solid and Hazardous Waste Management	2	0	0	2
XCEE29	PEC	Air and Noise Pollution and Control	2	0	0	2
XCEE30	PEC	Environmental Impact Assessment	2	0	0	2

### MINOR COURSES

Sub. Code	Name of the Course	Hours per week			C
		L	T	P	
XCEM01	Real Estate and Valuation	1	0	0	0
XCEM02	Digital Land Surveying and Mapping	0.5	0	0.5	0
XCEM03	General repairs and Remedial Water proofing	0.25	0	0.75	0
XCEM04	Building Regulations and Approval Process	1	0	0	0
XCEM05	Computational skills for Geotechnical Applications	0.25	0	0.75	0
XCEM06	Structural Quality Assessment	0.25	0	0.75	0
XCEM07	Plumbing and Sanitary Installations	0.25	0	0.75	0
XCEM08	Survey Camp	0.25	0	0.75	0

## 2. B.Tech-Civil Engineering (Part Time)

### SEMESTER I

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
PMA101	BSC	Mathematics (Transform & Computational Techniques)	2	0	0	2
PCE102	PCC	Disaster Preparedness & Planning	1	1	0	2
PCE103	ESC	Computer Aided Civil Engineering Drawing	1	0	2	2
PCE104	PCC	Mechanics of Fluids	2	0	2	3
PCE105	PCC	Mechanics of Solids	2	0	2	3
<b>TOTAL</b>			<b>8</b>	<b>1</b>	<b>6</b>	<b>12</b>

### SEMESTER II

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
PCE201	PCC	Instrumentation & Sensor Technologies for Civil Engineering Applications	2	0	2	3
PCE202	PCC	Materials Testing & Evaluation	2	0	2	3
PCE203	PCC	Mechanics of Materials	3	0	0	3
PMG204	HSM	Professional Practice, Law & Ethics	2	0	0	2
PES205	MAN	Environmental Studies	2	0	0	0
<b>TOTAL</b>			<b>11</b>	<b>0</b>	<b>4</b>	<b>11</b>

### SEMESTER III

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
PCE301	PCC	Geotechnical Engineering	2	0	2	3
PCE302	PCC	Hydraulic Engineering	2	0	2	3
PCE303	PCC	Structural Analysis	2	1	0	3
PCE304	PCC	Construction Engineering & Management	2	1	0	3
<b>TOTAL</b>			<b>8</b>	<b>2</b>	<b>4</b>	<b>12</b>



### SEMESTER IV

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
PCE401	PCC	Transportation Engineering	2	0	2	3
PCE402	PCC	Structural Engineering	2	1	0	3
PCE403	PCC	Hydrology & Water Resources Engineering	2	2	0	3
PCEE**	PEC	Elective-I	3	0	0	3
PCEE**	PEC	Elective-II	3	0	0	3
<b>TOTAL</b>			<b>12</b>	<b>3</b>	<b>2</b>	<b>15</b>

### SEMESTER V

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
PCE501	PCC	Environmental Engineering	2	0	2	3
PCE502	PEC	Elective-III	3	0	0	3
PCE503	PEC	Elective-IV	3	0	0	3
PCEE**	PEC	Elective V	3	0	0	3
PI505	HSM	Constitution of India	2	0	0	0
<b>TOTAL</b>			<b>13</b>	<b>0</b>	<b>2</b>	<b>12</b>

### SEMESTER VI

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
PCE601	PCC	Engineering Economics, Estimation & Costing	2	1	4	5
PCEE**	PEC	Elective-VI	3	0	0	3
PCEE**	PEC	Elective VII	3	0	0	3
<b>TOTAL</b>			<b>8</b>	<b>1</b>	<b>4</b>	<b>11</b>

### SEMESTER VII

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
PCEE**	PEC	Elective VIII	2	0	0	2
PCE702	Project	Project	0	0	20	10
<b>TOTAL</b>			<b>2</b>	<b>0</b>	<b>20</b>	<b>12</b>

**TOTAL CREDITS - 85**

**PROFESSIONAL ELECTIVE COURSE TRACKS- CIVIL ENGINEERING  
[PEC-CE]**

The following Seven Mandatory Professional Specialized Tracks identified to offer electives.

<b>Track</b>	<b>Professional Coré Courses (PCC-CE)</b>
I.	Transportation Engineering
II.	Structural Engineering
III.	Geotechnical Engineering
IV.	Hydraulics
V.	Structural Engineering
VI.	Hydrology & Water Resources Engineering
VII.	Construction Engineering & Management
VIII.	Environmental Engineering

**Track I**

<b>Sub. Code</b>	<b>Category</b>	<b>Name of the Course</b>	<b>Hours per week</b>			<b>C</b>
			<b>L</b>	<b>T</b>	<b>P</b>	
PCEE01	PEC	Pavement Design	3	0	0	3
PCEE02	PEC	Airport Planning and Design	3	0	0	3
PCEE03	PEC	Port and Harbour Engineering	3	0	0	3
PCEE04	PEC	Railway Engineering	3	0	0	3

**Track II &Track V**

<b>Sub. Code</b>	<b>Category</b>	<b>Name of the Course</b>	<b>Hours per week</b>			<b>C</b>
			<b>L</b>	<b>T</b>	<b>P</b>	
PCEE05	PEC	Advanced Structural Analysis	3	0	0	3
PCEE06	PEC	Design of Concrete Structures	3	0	0	3
PCEE07	PEC	Concrete Technology	3	0	0	3
PCEE08	PEC	Design of Steel Structures	3	0	0	3
PCEE09	PEC	Prestressed Concrete Structures	3	0	0	3
PCEE10	PEC	Bridge Engineering	3	0	0	3

### Track III

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
PCEE11	PEC	Foundation Engineering	3	0	0	3
PCEE12	PEC	Environmental Geotechnology	3	0	0	3
PCEE13	PEC	Geotechnical Design	3	0	0	3
PCEE14	PEC	Earthquake Engineering	3	0	0	3

### Track IV

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
PCEE15	PEC	Design of Hydraulic Structures	3	0	0	3
PCEE16	PEC	Basics of Computational Hydraulics	3	0	0	3
PCEE17	PEC	Urban Hydrology and Hydraulics	3	0	0	3
PCEE18	PEC	Groundwater Engineering	3	0	0	3

### Track VI

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
PCEE19	PEC	Water Quality Engineering	3	0	0	3
PCEE20	PEC	Surface Hydrology	3	0	0	3
PCEE21	PEC	Environmental Fluid Mechanics	3	0	0	3
PCEE22	PEC	Water Resources Field Methods	3	0	0	3

### Track VII

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
PCEE23	PEC	Repairs and Rehabilitation of Structures	3	0	0	3
PCEE24	PEC	Building Construction Practice	3	0	0	3
PCEE25	PEC	Construction Equipment and Automation	3	0	0	3
PCEE26	PEC	Contracts Management	3	0	0	3

### Track VIII

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
PCEE27	PEC	Environmental Law and Policy	2	0	0	2
PCEE28	PEC	Solid and Hazardous Waste Management	2	0	0	2
PCEE29	PEC	Air and Noise Pollution and Control	2	0	0	2
PCEE30	PEC	Environmental Impact Assessment	2	0	0	2

#### Note

L – Lecture, T – Tutorial, P – PRACTICAL, C - Credit

# 1. M.Tech in Environmental Engineering ( Full Time)

## SEMESTER-WISE STRUCTURE OF CURRICULUM

### REGULATIONS – 2018

(Applicable to the students admitted from the Academic year 2018-19 onwards)

#### SEMESTER I

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
YEN101	Core I	Chemistry and Microbiology for Environmental Engineers	3	0	0	3
YEN102	Core II	Unit Operation and Processes in Environmental Systems	3	0	0	3
YEN103	Programme Elective	Elective - I	3	0	0	3
YEN104	Programme Elective	Elective – II	3	0	0	3
YEN105	Core Lab I	Environmental Quality Measurements Laboratory - I (Water & Wastewater)	0	0	2	2
YEN106	Core Lab II	Microbiology Laboratory	0	0	2	2
YRM107	MLC	Research Methodology and IPR	2	0	0	2
	Audit I	Audit Course- 1	2	0	0	0
<b>TOTAL</b>			<b>16</b>	<b>0</b>	<b>4</b>	<b>18</b>

#### SEMESTER II

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
YEN201	Core III	Transport of Water and Wastewater	3	0	0	3
YEN202	Core IV	Biological Treatment of Wastewater	3	0	0	3
YEN203	Programme Elective	Elective - III	3	0	0	3
YEN204	Programme Elective	Elective – IV	3	0	0	3
YEN205	Core Lab III	Environmental Quality Measurements Laboratory - II (Air, Noise and Solidwaste)	0	0	2	2
YEN206	Core Lab IV	Unit Operation Laboratory	0	0	2	2
YEN207	Core	Mini Project	0	0	4	2
	Audit 2	Audit Course - 2	2	0	0	0
<b>TOTAL</b>			<b>14</b>	<b>0</b>	<b>8</b>	<b>18</b>

### SEMESTER III

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
YEN301	Programme Elective	Elective – V	3	0	0	3
	Open Elective	Open Elective	3	0	0	3
YEN303	Dissertation	Dissertation Phase - I	0	0	20	10
<b>TOTAL</b>			<b>6</b>	<b>0</b>	<b>20</b>	<b>16</b>

### SEMESTER IV

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
YEN401	Dissertation	Dissertation Phase - II	0	0	32	16
<b>TOTAL</b>			<b>--</b>	<b>--</b>	<b>--</b>	<b>16</b>

### TOTAL CREDITS - 68

**Note:**

1. HOD concerned has to provide options for selecting the relevant MOOC courses or any elective paper which are offered.
2. The credit distribution is followed as per the guidelines given by AICTE/UGC.

### PROFESSIONAL ELECTIVE COURSES

**Elective I**

Sub. Code	Name of the Course	Hours per week			C
		L	T	P	
YEN103A	Energy and Environment	3	0	0	3
YEN103B	Environmental Economics	3	0	0	3
YEN103C	Air Pollution and Control	3	0	0	3

**Elective II**

Sub. Code	Name of the Course	Hours per week			C
		L	T	P	
YEN104A	Instrumental Methods and Analysis of Environmental Pollutants	3	0	0	3
YEN104B	Theory and Practice of Industrial Wastewater Treatment	3	0	0	3
YEN104C	Environmental Policies and Legislation	3	0	0	3

**Elective III**

Sub. Code	Name of the Course	Hours per week			C
		L	T	P	
YEN203A	Environmental Biotechnology	3	0	0	3
YEN203B	Sustainable Urban development Concepts and Strategies	3	0	0	3
YEN203C	Solid and Hazardous Waste Management	3	0	0	3

**Elective IV**

Sub. Code	Name of the Course	Hours per week			C
		L	T	P	
YEN204A	Remote sensing and GIS	3	0	0	3
YEN204B	Environmental Geotechnology	3	0	0	3
YEN204C	Simulation and Modeling in Environmental Systems	3	0	0	3

**Elective V**

Sub. Code	Name of the Course	Hours per week			C
		L	T	P	
YEN301A	Ground Water Contamination and Transport Modeling	3	0	0	3
YEN301B	Environmental Impact Assessment	3	0	0	3
YEN301C	Membrane Separation for Water and Wastewater	3	0	0	3

**AUDIT COURSES**

Sub. Code	Name of the Course	Hours per week			C
		L	T	P	
YEGOE1	English for Research Paper Writing	2	0	0	0
YPSOE1	Constitution of India	2	0	0	0

**OPEN ELECTIVES**

Sub. Code	Name of the Course	Hours per week			C
		L	T	P	
YCOOE1	Business Analytics	3	0	0	3
YMEOE1	Industrial Safety	3	0	0	3
YMAOE1	Operations Research	3	0	0	3
YCOOE2	Cost Management of Engineering Projects	3	0	0	3

## 2. M.Tech in Environmental Engineering ( Part-Time)

### SEMESTER I

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
QEN101	Core I	Chemistry and Microbiology for Environmental Engineers	3	0	0	3
QEN102	Programme Elective	Elective - I	3	0	0	3
QEN103	Core Lab I	Microbiology Laboratory	0	0	2	2
QRM104	MLC	Research Methodology and IPR	2	0	0	2
<b>TOTAL</b>			<b>8</b>	<b>0</b>	<b>2</b>	<b>10</b>

### SEMESTER II

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
QEN201	Core II	Unit Operation and Processes in Environmental Systems	3	0	0	3
QEN202	Programme Elective	Elective – II	3	0	0	3
QEN203	Core Lab II	Environmental Quality Measurements Laboratory - I (Water &Wastewater)	0	0	2	2
	Audit I	Audit Course- 1	2	0	0	0
<b>TOTAL</b>			<b>8</b>	<b>0</b>	<b>2</b>	<b>8</b>

### SEMESTER III

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
QEN301	Core III	Transport of Water and Wastewater	3	0	0	3
QEN302	Programme Elective	Elective - III	3	0	0	3
QEN303	Core Lab III	Environmental Quality Measurements Laboratory - II(Air, Noise and Solidwaste)	0	0	2	2
	Audit 2	Audit Course - 2	2	0	0	0
<b>TOTAL</b>			<b>8</b>	<b>0</b>	<b>2</b>	<b>8</b>



### SEMESTER IV

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
QEN401	Core IV	Biological Treatment of Wastewater	3	0	0	3
QEN402	Programme Elective	Elective – IV	3	0	0	3
QEN403	Core Lab IV	Unit Operation Laboratory	0	0	2	2
QEN404	Core	Mini Project	0	0	4	2
TOTAL			6	0	6	10

### SEMESTER V

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
QEN501	Programme Elective	Elective – V	3	0	0	3
QEN502	Open Elective	Open Elective	3	0	0	3
QEN503	Dissertation	Dissertation Phase - I	0	0	20	10
TOTAL			6	0	20	16

### SEMESTER VI

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
QEN601	Dissertation	Dissertation Phase - II	0	0	32	16
TOTAL			--	--	32	16

**TOTAL CREDITS - 68**

## PROFESSIONAL ELECTIVE COURSES

### Elective I

Sub. Code	Name of the Course	Hours per week			C
		L	T	P	
QEN102A	Energy and Environment	3	0	0	3
QEN102B	Environmental Economics	3	0	0	3
QEN102C	Air Pollution and Control	3	0	0	3

### Elective II

Sub. Code	Name of the Course	Hours per week			C
		L	T	P	
QEN202A	Instrumental Methods and Analysis of Environmental Pollutants	3	0	0	3
QEN202B	Theory and Practice of Industrial Wastewater Treatment	3	0	0	3
QEN202C	Environmental Policies and Legislation	3	0	0	3

### Elective III

Sub. Code	Name of the Course	Hours per week			C
		L	T	P	
QEN302A	Environmental Biotechnology	3	0	0	3
QEN302B	Sustainable Urban Development Concepts and Strategies	3	0	0	3
QEN302C	Solid and Hazardous Waste Management	3	0	0	3

### Elective IV

Sub. Code	Name of the Course	Hours per week			C
		L	T	P	
QEN402A	Remote sensing and GIS	3	0	0	3
QEN402B	Environmental Geotechnology	3	0	0	3
QEN402C	Simulation and Modeling in Environmental Systems	3	0	0	3

**Elective V**

Sub. Code	Name of the Course	Hours per week			C
		L	T	P	
QEN501A	Ground Water Contamination and Transport Modeling	3	0	0	3
QEN501B	Environmental Impact Assessment	3	0	0	3
QEN501C	Membrane Separation for Water and Waste water	3	0	0	3

**AUDIT COURSES**

Sub. Code	Name of the Course	Hours per week			C
		L	T	P	
QEGOE1	English for Research Paper Writing	2	0	0	0
QPSOE1	Constitution of India	2	0	0	0

**OPEN ELECTIVES**

Sub. Code	Name of the Course	Hours per week			C
		L	T	P	
YCOOE1	Business Analytics	3	0	0	3
YMEOE1	Industrial Safety	3	0	0	3
YMAOE1	Operations Research	3	0	0	3
YCOOE2	Cost Management of Engineering Projects	3	0	0	3