BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

BETHLAHEM INSTITUTE OF ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING

COURSE OUTCOMES

AND

CO-PO MAPPING

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Anna University Regulation 2021

List of Course Names

Sl. No	Course code	Course title	L	T	P	C
SEMESTER-I						
1	HS3152	Professional English - I	3	0	0	3
2	MA3151	Matrices and Calculus	3	1	0	4
3	PH3151	Engineering Physics	3	0	0	3
4	CY3151	Engineering Chemistry	3	0	0	3
5	GE3151	Problem Solving and PythonProgramming	3	0	0	3
6	GE3152	தமிழர் மரபு /Heritage of Tamils	1	0	0	1
7	GE3171	Problem Solving and PythonProgramming Laboratory	0	0	4	4
8	BS3171	Physics and Chemistry Laboratory	0	0	4	4
9	GE3172	English Laboratory$^{\$}$	0	0	2	2
SEMESTER-II						
1	HS3252	Professional English - II	2	0	0	2
2	MA3251	Statistics and Numerical Methods	3	1	0	4
3	PH3201	Physics for Civil Engineering	3	0	0	3
4	BE3252	Basic Electrical, Electronics and Instrumentation Engineering	3	0	0	3
5	GE3251	Engineering Graphics	2	0	4	6
6	GE3271	Engineering Practices Laboratory	0	0	4	4

7	BE3272	Basic Electrical, Electronics and Instrumentation Engineering Laboratory	0	0	4	4
8	GE3272	Communication Laboratory / Foreign Language $	0	0	4	4
SEMESTER-III						
1	MA3351	Transforms and Partial Differential Equations	3	1	0	4
2	ME3351	Engineering Mechanics	3	0	0	3
3	CE3301	Fluid Mechanics	3	0	0	3
4	CE3302	Construction Materials and Technology	3	0	0	3
5	CE3303	Water Supply and WastewaterEngineering	4	0	0	4
6	CE3351	Surveying and Levelling	3	0	0	3
7	CE3361	Surveying and Levelling Laboratory	0	0	3	3
8	CE3311	Water and Wastewater Analysis Laboratory	0	0	3	3
9	GE3361	Professional Development	0	0	2	2
SEMESTER-IV						
1	CE3401	Applied Hydraulics Engineering	3	1	0	4
2	CE3402	Strength of Materials	3	0	0	3
3	CE3403	Concrete Technology	3	0	0	3
4	CE3404	Soil Mechanics	3	0	0	3
5	CE3405	Highway and Railway Engineering	3	0	0	3
6	GE3451	Environmental Sciences and Sustainability	2	0	0	2
7	CE3411	Hydraulic Engineering Laboratory	0	0	3	3
8	CE3412	Materials Testing Laboratory	0	0	4	4
9	CE3413	Soil Mechanics Laboratory	0	0	3	3
SEMESTER-V						
1	CE3501	Design of Reinforced Concrete StructuralElements	3	0	0	3
2	CE3502	Structural Analysis I	3	0	0	3

3	CE3503	Foundation Engineering	3	0	0	3
4	CE3016	Ground Improvement Techniques	3	0	0	3
5	CE3003	Prefabricated Structures	3	0	0	3
6	CE3013	Advanced Concrete Techniques	3	0	0	3
7	CE3511	Highway Engineering Laboratory	0	0	4	4
8	CE3512	Survey Camp (2 weeks)	0	0	0	0
SEMESTER-VI						
1	CE3601	Design of Steel Structural Elements	3	0	0	3
2	CE3602	Structural Analysis II	3	0	0	3
3	AG3601	Engineering Geology	3	0	0	3
4	CE3024	Hydrographic Surveying	3	0	0	3
5	CE3025	Airport & Harbour Engineering	3	0	0	3
6	CE3033	Solid & Hazardous Waste Management	3	0	0	3
7	CE3611	Building Drawing and Detailing Laboratory	0	0	4	4
SEMESTER-VII						
1	CE3701	Estimation, Costing and Valuation Engineering	3	0	0	3
2	AI3404	Hydrology & Water Resource Engineering	3	0	0	3
3	GE3791	Human Values & Ethiccs	2	0	0	2
4	GE3752	Total Quality Management	3	0	0	3
5	OAI351	Urban Agriculture	3	0	0	3
6	OHS352	Project Report Writing	3	0	0	3
SEMESTER-VIII						
1	CE8016	Ground Water Engineering	3	0	0	3
2	CE8020	Maintenance Repair & Rehabilitation Structures	3	0	0	3
3	CE8016	Project Work	0	0	20	10

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

DEPARTMENT OF CIVIL ENGINEERING

Anna university regulation 2017

Course outcome and CO-PO mapping

YEAR	I	SEM	01	SUBJECT CODE	HS3151
SUBJECT	PROFESSIONAL ENGLISH I				

The students will be able to:

CO1	Create ideas and express them effectively.
CO2	Improve interpersonal communication through personal and societal experiences.
CO3	Describe the process effectively in diverse environments.
CO4	Improve mass communication skills.
CO5	Participate effectively in public forums.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	3	3	-	-	-	-	1
CO2	-	-		-		-	-	-	3	3	-	-	-	-	1
CO3	-	-	-	-	-	-	3	-	-	3	-	-	-	-	1
CO4	-	-	-	-	-	-	-	-	-	3	-	-	-	-	1
CO5	-	--	-	-	-	2	-	-	3	3	-	-	-	-	1
AVG	-	-	-	-	-	0.4	0.6	-	1.8	3	-	-	-	-	1

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	I	SEM	01	SUBJECT CODE	MA3151
SUBJECT	MATRICES AND CALCULUS				

The students will be able to:

CO1	Explain the different types of Matrices, properties of matrices and Cayley-Hamilton
CO2	Apply different techniques of differential calculus.
CO3	Explain the functions of several partial differentiation using various methods.
CO4	Apply the different techniques of integral calculus.
CO5	Explain the different kinds of integrals. understand how to find area and volume by using double and triple integrals.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	1	-	-	1	3	1	-	1	2	1	-
CO2	3	3	2	2	-	1	1	-	2	1	-	3	1	-	2
CO3	3	2	1	2	2	-	-	2	2	1	1	1	3	-	-
CO4	3	3	2	3	-	2	1	-	1	1	-	2	2	2	-
CO5	3	2	3	2	1	-	-	1	2	-	-	3	2	-	2
AVG	3	2.4	2	2	0.8	0.6	0.4	0.8	2	0.8	0.2	2	2	0.6	0.8

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	I	SEM	01	SUBJECT CODE	PH3151
SUBJECT	ENGINEERING PHYSICS				

The students will be able to:

CO1	Explain the importance of mechanics.
CO2	Examine the concepts of electromagnetic waves.
CO3	Demonstrate a strong foundational knowledge in oscillations, optics and lasers.
CO4	Explain the importance of quantum physics.
CO5	Apply quantum mechanical principles.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO1	3	3	2	2	2	2	-	-	1	-	-	2	3	-	-
CO2	3	3	2	-	2	2	-	-	-	-	-	2	2	-	2
CO3	3	2	3	2	-	2	3	-	-	-	-	3	3	1	-
CO4	3	3	2	-	2	2	-	-	-	-	-	2	-	1	2
CO5	2	3	3	2	-	2	1	-	-	-	-	3	2	-	1
AVG	2.8	2.8	2.4	1.2	1.2	2	0.8	-	0.2	-	-	2.4	2	0.4	1

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	I	SEM	01	SUBJECT CODE	CY3151
SUBJECT	ENGINEERING CHEMISTRY				

The students will be able to:

CO1	Analyze the various water quality parameters and propose suitable methods for water treatment.
CO2	Identify and apply the basic concepts of nanoscience and nanotechnology for the production of nanomaterials to be applied for engineering and technological needs.
CO3	Infer sound knowledge about phase rule and composites for the selection of materials.
CO4	Analyse and classify the available fuels for their appropriate use in industry.
CO5	Elaborate the available forms of energy resources and their judicious use in energy sectors by providing due emphasis for attaining sustainable energy.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	2	-	2	2	2	-	-	-	-	2	2	-	2
CO2	3	-	2	-	3	2	2	-	-	2	-	-	2	-	-
CO3	3	-	2	-	3	2	1	-	-	2	-	-	1	-	3
CO4	2	-	3	-	-	2	3	-	-	-	-	2	-	-	2
CO5	3	-	3	-	2	2	3	-	-	-	-	3	2	-	2
AVG	2.8	0.2	2.4	-	2	2	2.2	-	-	0.8	-	1.4	1.4	-	1.8

YEAR	I	SEM	01	SUBJECT CODE	GE3151

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

SUBJECT	PROBLEM SOLVING AND PYTHON PROGRAMMING

The students will be able to:

CO1	Explain the principles of problem-solving techniques.
CO2	Create simple python programs.
CO3	Develop programs based on control flow.
CO4	Analyze compound data using lists, tuples, dictionaries.
CO5	Design files, modules & packages.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	-	-	-	-	3	1	3	-	-	3	2
CO2	3	3	3	3	-	-	-	-	3	1	3	-	-	1	2
CO3	3	3	3	3	2	-	-	-	3	1	3	-	-	3	2
CO4	3	3	3	3	2	-	-	-	3	1	3	-	-	3	2
CO5	3	3	3	3	2	-	-	-	3	1	3	-	-	3	2
AVG	3	3	3	3	1.2	-	-	-	3	1	3	-	-	2.6	2

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	I	SEM	01	SUBJECT CODE	BS3171
SUBJECT	PHYSICS AND CHEMISTRY LABORATORY				

The students will be able to:

CO1	Apply the hands-on experience in Air wedge.
CO2	Apply the hands on experience in young modulus.
CO3	Demonstrate the working of torsion pendulum.
CO4	Analyze compound data using Acquire practical skills in the determination of water quality parameters.
CO5	Analyze the determination of molecular weight.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	-	-	-	-	2	-	1	3	1	2
CO2	3	3	3	1	3	2	-	2	-	-	-	1	1	-	3
CO3	3	3	3	1	3	-	-	-	1	-	-	1	-	1	-
CO4	3	3	3	-	-	2	-	-	-	-	-	-	-	-	3
CO5	3	3	3	-	-	-	-	-	1	-	-	1	-	1	-
AVG	3	3	3	1	1.8	0.8	-	0.4	0.4	0.4	-	0.8	0.8	0.6	1.6

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	I	SEM	01	SUBJECT CODE	GE3171
SUBJECT	PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY				

The students will be able to:

CO1	Develop simple algorithms, Pseudo code, flowchart for simple problems.
CO2	Develop and execute simple Python programs.
CO3	Build programs in Python using conditionals statement and loop statement.
CO4	Develop simple programs using functions and use Python data structures to implement programs.
CO5	Create files, packages and modules in python.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	-	-	-	-	3	1	3	-	3	3	2
CO2	3	3	3	3	-	-	-	-	3	1	3	-	1	1	2
CO3	3	3	3	3	2	-	-	-	3	1	3	-	3	3	2
CO4	3	3	3	3	2	-	-	-	3	1	3	-	3	3	2
CO5	3	3	3	3	2	-	-	-	3	1	3	-	3	2	2
AVG	3	3	3	3	1.2	-	-	-	3	1	3	-	2.6	2.4	2

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	I	SEM	02	SUBJECT CODE	HS3251
SUBJECT	PROFESSIONAL ENGLISH II				

The students will be able to:

CO1	Compare and contrast the ideas and products in a technical context.
CO2	Analyze the causes of events and represent them appropriately.
CO3	Explore the problems to arrive at suitable solutions for the same and present them in oral and written form.
CO4	Compile events and processes on the technical contexts.
CO5	Present ideas logically and prepare job application letter with resume.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	2	-	-	-	-	-	2
CO2	-	-	-	-	-	3	3	-	-	-	-	-	-	-	2
CO3	-	3	3	3	-	-	2	-	-	3	-	-	-	-	2
CO4	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-
CO5	-	--	-	-	-	-	-	-	-	2	2	2	-	-	-
AVG	-	0.6	0.6	0.6	-	-	1	-	0.8	1.4	0.4	0.4	-	-	1.2

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	I	SEM	02	SUBJECT CODE	MA3251
SUBJECT	STATISTICS AND NUMERICAL METHODS				

The students will be able to:

CO1	Analyze the concept of testing of hypothesis for small and large samples in real life problems.
CO2	Analyze the basic concepts of classifications of design experiments in the field of agriculture.
CO3	Solve the numerical techniques of interpolation in various intervals and the numerical techniques of differentiation and integration for engineering problems.
CO4	Apply various techniques and methods for solving first and second order ordinary differential equations.
CO5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO1	3	2	3	2	2	-	-	1	3	3	-	2	2	1	-
CO2	3	3	2	2	-	2	1	-	2	2	-	3	1	-	2
CO3	3	2	1	2	2	-	-	2	2	1	2	1	2	-	-
CO4	3	3	2	3	-	1	2	-	1	2	-	2	1	2	-
CO5	3	2	3	2	2	-	-	1	2	-	-	3	2	-	1
AVG	3	2.4	2.2	2.2	1.2	0.6	0.6	0.8	2	1.6	0.4	2.2	1.6	0.6	0.6

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	I	SEM	02	SUBJECT CODE	PH3201
SUBJECT	PHYSICS FOR CIVIL ENGINEERING				

The students will be able to:

CO1	Acquire knowledge about heat transfer through different materials, thermal performance of building and thermal insulation
CO2	Know on the ventilation and air conditioning of buildings
CO3	Know the concepts of sound absorption, noise insulation and lighting designs
CO4	Explain the processing and applications of composites, metallic glasses, shape memory alloys and ceramics
CO5	Know an awareness on natural disasters such as earth quake, cyclone, fire and safety measures

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	-	1	-	-	-	-	-	-	3	3	-	-
CO2	3	3	1	-	1	-	-	-	-	1	-	-	-	-	-
CO3	3	2	2	-	-	-	3	-	-	-	-	-	3	1	2
CO4	3	2	1	-	2	-	-	-	-	1	-	-	-	1	2
CO5	3	2	2	-	2	-	1	-	-	-	-	3	2	-	1
AVG	3	2.4	1.6	-	1.2	-	0.8	-	-	0.4	-	1.2	1.6	0.4	1

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	I	SEM	02	SUBJECT CODE	BE3252
SUBJECT	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING				

The students will be able to:

CO1	Analyze the electric circuit parameters for simple problems.
CO2	Explain the working principle and applications of electrical machines.
CO3	Analyze the characteristics of analog electronic devices.
CO4	Explain the basic concepts of digital electronics.
CO5	Explain the operating principles of measuring instruments.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	3	2	-	-	2	-	3	2	2	-	2
CO2	3	3	3	2	-	2	-	-	2	-	-	2	2	-	2
CO3	3	3	2	2	2	-	-	-	1	-	-	2	2	-	2
CO4	3	3	3	3	3	2	-	-	3	-	3	3	2	-	2
CO5	3	3	2	1	1	-	-	-	1	-	-	2	2	1	-
AVG	3	3	2.6	2	1.8	1.2	-	-	1.8	-	1.2	2.2	2	0.2	1.6

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	I	SEM	02	SUBJECT CODE	GE3251
SUBJECT	ENGINEERING GRAPHICS				

The students will be able to:

CO1	Create BIS conventions and specifications for engineering drawing.
CO2	Construct the conic curves, involutes and cycloid.
CO3	Solve practical problems involving projection of lines.
CO4	Design the orthographic, isometric and perspective projections of simple solids.
CO5	Design the development of simple solids.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	2	-	-	-	-	-	1	2	2	2	-
CO2	3	3	2	3	3	3	-	-	-	-	-	2	3	2	-
CO3	3	2	3	3	3	-	-	-	-	-	-	2	2	-	-
CO4	3	2	2	2	-	-	-	-	-	-	-	3	3	-	2
CO5	3	2	2	3	3	-	-	-	-	2	-	-	2	-	2
AVG	3	2.4	2.2	2.6	2.2	0.6	-	-	-	0.4	0.2	1.8	2.4	0.8	0.8

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	I	SEM	02	SUBJECT CODE	GE3271
SUBJECT	ENGINEERING PRACTICES LABORATORY				

The students will be able to:

CO1	Design pipe line plan, lay and connect pipe fittings used in common household Plumbing work.
CO2	Plan and make joints in wood materials used in common house hold wood work.
CO3	Construct various joints in steel plates using arc welding work.
CO4	Make up various simple process like turning, drilling, and tapping in parts.
CO5	Combine simple mechanical assembly of common household equipment.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO1	3	-	-	-	-	-	-	-	-	1	2	-	-	-	2
CO2	3	-	3	-	-	-	-	-	-	1	2	-	-	-	2
CO3	3	-	3	-	-	-	-	-	-	1	2	-	-	-	2
CO4	3	-	3	-	-	-	-	-	-	1	2	-	-	-	2
CO5	3	-	-	-	-	-	-	-	-	1	2	-	-	-	2
AVG	3	-	1.8	-	-	-	-	-	-	1	2	-	-	-	2

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	I	SEM	02	SUBJECT CODE	CS3271
SUBJECT	PROGRAMMING IN C LABORATORY				

The students will be able to:

CO1	Demonstrate the basics of C program.
CO2	Design and implement applications using arrays and strings
CO3	Develop and implement modular applications in C using functions
CO4	Develop applications in C using structures and pointers.
CO5	Design applications using sequential and random-access file processing.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	-	-	-	-	-	3	2	2	2	3	3	3
CO2	3	3	1	-	-	-	-	-	3	2	2	2	2	3	3
CO3	3	2	1	-	-	-	-	-	3	2	2	2	2	3	3
CO4	3	2	1	-	-	-	-	-	3	2	2	2	2	3	3
CO5	3	2	1	-	-	-	-	-	3	2	2	2	2	3	3
AVG	3	2	1	-	-	-	-	-	3	2	2	2	2.2	3	3

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	03	SUBJECT CODE	MA3351
SUBJECT	DISCRETE MATHEMATICS				

The students will be able to:

CO1	Know the basic concepts of PDE for solving standard partial differential equations.
CO2	Determine the Fourier series analysis which is central to many applications in engineering apart its use in solving boundary value problems.
CO3	Apply the Fourier series techniques in solving heat flow problems used in various situations.
CO4	Analyze Fourier transform techniques used in wide variety of situations.
CO5	Understand the effective mathematical tools for the solutions of partial differential equations that model several physical processes and to develop Z transform techniques for discrete time

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	-	-	-	-	2	1	-	1	2	2	-
CO2	3	2	2	2	-	-	-	-	1	2	-	1	1	1	-
CO3	2	3	1	2	-	-	-	-	1	1	-	1	2	1	-
CO4	3	2	2	1	-	-	-	-	1	1	-	1	1	1	-
CO5	2	2	3	1	-	-	-	-	1	1	-	1	2	2	-
AVG	2.6	2.4	2	1.6	-	-	-	-	1.2	1.2	-	1	1.6	1.4	-

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	03	SUBJECT CODE	ME3351
SUBJECT	ENGINEERING MECHANICS				

The students will be able to:

CO1	Understand the use scalar and vector analytical techniques for analyzing forces in Statically determinate structures
CO2	Explain the use scalar and vector analytical techniques for analyzing forces in Statically In- determinate structures
CO3	Know to introduce the equilibrium of rigid bodies
CO4	Understand the distributed forces, surface, loading on beam and intensity.
CO5	Determine the principles of friction, forces and to determine the apply the concepts of frictional

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	2	-	-	-	-	-	-	2	3	1	1
CO2	3	2	2	1	2	-	-	-	-	-	-	2	3	1	1
CO3	3	2	3	1	2	-	-	-	-	-	-	2	3	1	2
CO4	3	2	3	1	2	-	-	-	-	-	-	2	3	1	2
CO5	3	2	3	1	2	-	-	-	-	-	-	2	3	1	2
AVG	3	2	2.6	1	2	-	-	-	-	-	-	2	3	1	1.6

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	03	SUBJECT CODE	CE3301
SUBJECT	FLUID MECHANICS				

The students will be able to:

CO1	Apply a basic knowledge of fluids in static, kinematic and dynamic equilibrium.
CO2	Understand and solve the problems related to equation of motion.
CO3	Know about dimensional and model analysis.
CO4	Understand the types of flow and losses of flow in pipes.
CO5	Understand and solve the boundary layer problems.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	1	2	1	1	1	1	-	2	3	1	1
CO2	3	3	3	1	1	2	1	1	1	1	-	2	3	1	1
CO3	3	3	3	1	-	1	1	1	1	1	-	2	3	1	1
CO4	3	3	3	1	2	2	1	1	1	1	-	2	3	1	1
CO5	3	3	3	-	2	1	1	1	1	1	-	2	3	1	1
AVG	3	3	3	0.8	1.2	1.6	1	1	1	1	-	2	3	1	1

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	03	SUBJECT CODE	CE3302
SUBJECT	CONSTRUCTION MATERIALS AND TECHNOLOGY				

The students will be able to:

CO1	Identify the good quality brick, stone and blocks for construction.
CO2	Recognize the market forms of timber, steel, aluminum and applications of various composite
CO3	Know the best construction and service practices such as thermal insulations and air conditioning of the building
CO4	Examine the various equipment's for construction works conditioning of building
CO5	Understand the construction planning and scheduling techniques

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	3	-	2	2	-	-	-	-	2	3	-	-
CO2	3	-	-	2	-	-	2	-	-	-	-	2	3	-	2
CO3	3	-	-	2	-	-	3	-	-	-	2	-	3	-	2
CO4	2	-	-	-	-	-	-	-	-	-	2	-	3	3	-
CO5	2	3	2	3	2	2	-	-	2	-	3	2	3	3	3
AVG	2.4	1	0.4	2	0.4	0.8	1.4	-	0.4	-	1.4	1.2	3		

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	03	SUBJECT CODE	CE3303
SUBJECT	WATER SUPPLY AND WASTE WATER ENGINEERING				

The students will be able to:

CO1	Understand the various components of water supply scheme and design of intake structure and conveyance system for water transmission
CO2	Understand on the characteristics and composition of sewage, ability to estimate sewage generation and design sewer system including sewage pumping stations
CO3	Understand the process of conventional treatment and design of water and wastewater treatment system and gain knowledge of selection of treatment process and biological treatment process
CO4	Design and evaluate water distribution system and water supply in buildings and understand the self-purification of streams and sludge and septage disposal methods.
CO5	Understand and design the various advanced treatment system and knowledge about the recent advances in water and wastewater treatment process and reuse of sewage

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	-	2	-	-	-	1	1	-	-	-	3	-	-
CO2	2	3	-	2	-	-	1	1	-	-	-	3	-	-	-
CO3	3	3	3	-	-	3	2	2	2	-	2	-	3	2	2
CO4	3	3	3	-	2	3	3	2	3	-	2	-	3	2	3
CO5	3	3	3	2	2	3	3	2	3	2	2	3	3	2	3
AVG	2.6	3	1.8	1.2	0.8	1.8	1.8	1.6	1.8	0.4	1.2	1.2	2.4	1.2	1.6

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	03	SUBJECT CODE	CE3351
SUBJECT	SURVEYING AND LEVELLING				

The students will be able to:

CO1	Know the rudiments of various surveying and its principles.
CO2	Imparts knowledge in computation of levels of terrain and ground
CO3	Explain the concepts of Theodolite Surveying for complex surveying operations
CO4	Understand the procedure for establishing horizontal and vertical control
CO5	Know about modern surveying instruments

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	3	2	2	3	-	2	2	-	2	-	3	3	3
CO2	3	3	2	2	2	3	-	2	2	-	2	-	3	3	3
CO3	3	3	3	2	3	3	-	2	2	-	2	-	3	3	3
CO4	3	3	3	3	3	3	2	2	3	-	2	2	3	3	3
CO5	3	3	3	3	3	3	2	3	2	-	2	2	3	3	3
AVG	2.8	2.8	2.8	2.4	2.6	3	0.8	2.2	2.2	-	2	0.8	3	3	3

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	03	SUBJECT CODE	CE3361
SUBJECT	SURVEYING AND LEVELLING LABORATORY				

The students will be able to:

CO1	Explain the basic surveying instruments like chain/tape, compass and levelling instruments
CO2	Explain the levelling instrument for surveying operations
CO3	Apply the theodolite for various surveying operations
CO4	Analyze the necessary surveys for social infrastructures
CO5	Determine the planimetric maps

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	3	2	3	2	3	3	3	3	1	3	3	3
CO2	3	2	3	-	3	3	3	3	3	3	3	1	3	3	3
CO3	3	1	2	-	3	2	-	-	3	-	-	2	3	3	3
CO4	3	3	2	3	2	3	3	2	3	3	3	1	3	3	3
CO5	3	3	3	2	2	3	3	2	3	3	3	1	3	3	3
AVG	3	2.2	2.6	1.6	2.4	2.8	2	2.6	3	2.4	2.4	1.2	3	3	3

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	03	SUBJECT CODE	CE3311
SUBJECT	WATER AND WASTEWATER ANALYSIS LABORATORY				

The students will be able to:

CO1	Calibrate And Standardize the Equipment
CO2	Collect Proper Sample for Analysis
CO3	Know The Sample Preservation Methods
CO4	Perform Field Oriented Testing of Water, Wastewater
CO5	Perform Coliform Analysis

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	1	2	1	2	2	1	1	1	3	1	2	2
CO2	2	1	1	1	1	2	2	2	1	1	2	3	2	2	2
CO3	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
CO4	3	3	3	3	3	2	2	3	3	2	3	2	3	3	3
CO5	2	3	3	3	3	2	2	3	2	2	2	3	2	2	2
AVG	1.8	1.8	1.8	1.8	2	1.8	2	2.4	1.8	1.6	2	2.6	2	2.2	2.2

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	04	SUBJECT CODE	CE3401
SUBJECT	APPLIED HYDRAULICS ENGINEERING				

The students will be able to:

CO1	Describe the basics of open channel flow, its classification and analysis of uniform flow in steady state conditions with specific energy concept and its application
CO2	Analyze steady gradually varied flow, water surface profiles and its length calculation using direct and standard step methods with change in water surface profiles due to change in grades
CO3	Derive the relationship among the sequent depths of steady rapidly varied flow and estimating energy loss in hydraulic jump with exposure to positive and negative surges
CO4	Design turbines and explain the working principle
CO5	Explain the working principle with characteristic curves and design centrifugal and reciprocating pumps

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	3	1	2	2	1	2	1	1	3	3	2	2
CO2	3	3	2	3	2	2	2	1	2	1	1	3	3	2	2
CO3	3	3	2	3	1	2	2	1	2	1	1	3	3	2	3
CO4	3	3	3	3	1	2	2	1	2	1	1	3	3	2	3
CO5	3	3	3	3	1	2	2	1	2	1	1	3	3	2	3
AVG	3	3	2.4	3	1.2	2	2	1	2	1	1	3	3	2	2.6

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	04	SUBJECT CODE	CE3402
SUBJECT	STRENGTH OF MATERIALS				

The students will be able to:

CO1	Understand the concepts of stress and strain, principal stresses and principal planes.
CO2	Determine Shear force and bending moment in beams and understand concept of theory of simple bending.
CO3	Calculate the deflection of beams by different methods and selection of method for determining slope or deflection.
CO4	Analyze propped cantilever, fixed beams and continuous beams for external loadings and support settlements.
CO5	Determine the stresses due to Unsymmetrical bending of beams, locate the shear center, and study the various theories of failure

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	2	3	1	3	2	3	1	3	3	3	3
CO2	3	3	3	3	2	3	1	3	2	3	1	3	3	3	3
CO3	3	3	3	3	2	3	1	3	2	3	1	3	3	3	3
CO4	3	3	3	3	2	3	1	3	2	3	1	3	3	3	3
CO5	3	3	3	3	2	3	1	3	2	3	1	3	3	3	3
AVG	3	3	3	3	2	3	1	3	2	3	1	3	3	3	3

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	04	SUBJECT CODE	CE3403
SUBJECT	CONCRETE TECHNOLOGY				

The students will be able to:

CO1	Understand the requirements of cement, aggregates and water for concrete
CO2	Select suitable admixtures for enhancing the properties of concrete
CO3	Design concrete mixes as per IS method of mix design
CO4	Determine the properties of concrete at fresh and hardened state.
CO5	Know the importance of special concretes for specific requirements.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	-	-	-	-	-	1	2	2	1	3	-	3	2
CO2	1	2	-	-	2	-	-	1	2	2	1	3	-	3	2
CO3	3	3	2	-	2	-	-	1	2	2	1	3	-	3	2
CO4	2	3	2	-	1	-	-	1	1	2	3	3	-	3	2
CO5	2	2	-	-	2	-	-	1	1	2	2	3	-	3	2
AVG	1.8	2.4	0.8	-	1.4	-	-	1	1.6	2	1.6	3	-	3	2

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	04	SUBJECT CODE	CE3404
SUBJECT	SOIL MECHANICS				

The students will be able to:

CO1	Demonstrate an ability to identify various types of soils and its properties, formulate and solve engineering Problems
CO2	Explain the basic understanding of flow through soil medium and its impact of engineering solution
CO3	Understand the basic concept of stress distribution in loaded soil medium and soil settlement due to consolidation
CO4	Understand the shear strength of soils and its impact of engineering solutions to the loaded soil medium and also will be aware of contemporary issues on shear strength of soils.
CO5	Demonstrate an ability to design both finite and infinite slopes, component and process as per needs and specifications.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	2	3	1	1	1	2	1	2	3	3	3	2
CO2	3	2	3	2	3	1	1	1	2	1	2	3	2	2	3
CO3	3	3	2	2	2	2	1	1	2	1	2	3	2	2	3
CO4	2	3	3	2	2	1	1	1	1	1	2	3	2	2	3
CO5	3	3	2	2	2	1	1	1	1	1	1	3	2	3	2
AVG	2.6	2.8	2.4	2	2.4	1.2	1	1	1.6	1	1.8	3	2	2.4	2.6

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	04	SUBJECT CODE	CE3405
SUBJECT	HIGHWAY AND RAILWAY ENGINEERING				

The students will be able to:

CO1	Plan a highway according to the principles and standards adopted in various institutions in India
CO2	Design the geometric features of road network and components of pavement
CO3	Test the highway materials and construction practice methods and know its properties and able to perform pavement evaluation and management
CO4	Understand the methods of route alignment and design elements in railway planning and constructions
CO5	Understand the construction techniques and maintenance of track laying and railway stations

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO1	3	-	-	2	-	3	1	3	-	-	-	-	3	2	-
CO2	2	3	3	2	2	-	2	3	2	-	2	3	3	3	-
CO3	2	3	2	2	2	3	3	3	-	-	3	3	3	3	-
CO4	3	-	-	-	-	3	-	3	-	1	-	-	3	2	2
3CO5	-	-	3	-	2	-	-	-	2	-	-	2	3	3	3
AVG	2	1.2	1.6	1.2	1.2	1.2	1.2	2.4	0.8	0.2	1	1.6	3	2.6	1

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	04	SUBJECT CODE	GE3451
SUBJECT	ENVIRONMENTAL SCIENCES AND SUSTAINABILITY				

The students will be able to:

CO1	Find knowledge to protect environment and minimize environmental pollution.
CO2	Create an awareness about value of environment at infant stage.
CO3	Analyze ignorance, incomplete knowledge and misconceptions about environment.
CO4	Take part in the life style that would reduce environmental disasters.
CO5	Discover the importance of clean environment and a healthy society.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	2	-	-	2	3	-	2	3	-	-	1	-	-
CO2	2	-	2	-	2	-	-	-	-	-	-	1	-	1	-
CO3	-	-	-	2	2	-	2	-	-		-	-	-	1	-
CO4	-	-	-	-	-	-	2	-	-	2	2	-	-	-	1
CO5	-	-	-	-	-	2	2	-	-	-	1	2	-	-	1
AVG	0.4	-	0.8	0.4	0.8	0.8	1.8	-	0.4	1	0.6	0.6	0.2	0.4	0.4

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	04	SUBJECT CODE	CE3411
SUBJECT	HYDRAULIC ENGINEERING LABORATORY				

The students will be able to:

CO1	Apply Bernoulli equation for calibration of flow measuring devices.
CO2	Determine the performance characteristics of positive displacement pumps.
CO3	Measure friction factor in pipes and compare with Moody diagram
CO4	Determine the performance characteristics of positive displacement pumps.
CO5	Determine the performance characteristics of turbines.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO1	2	2	1	3	1	2	2	1	2	1	1	2	2	1	1
CO2	3	2	1	3	1	2	2	1	2	1	1	2	3	1	1
CO3	3	3	2	3	1	2	2	1	3	1	1	2	3	2	1
CO4	3	3	2	3	1	2	2	1	3	1	1	2	3	2	1
CO5	3	3	2	3	1	2	2	1	3	1	1	2	3	2	1
AVG	2.8	2.6	1.6	3	1	2	2	1	3	1	1	2	2.8	1.6	1

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	04	SUBJECT CODE	CE3412
SUBJECT	MATERIALS TESTING LABORATORY				

The students will be able to:

CO1	Determine the mechanical properties of steel.
CO2	Determine the physical properties of cement
CO3	Determine the physical properties of fine and coarse aggregate.
CO4	Determine the workability and compressive strength of concrete
CO5	Determine the strength of brick and wood.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO1	2	2	1	3	1	2	2	1	3	1	1	2	2	2	2
CO2	3	2	1	3	1	2	2	1	3	1	1	2	2	2	2
CO3	3	3	2	3	1	2	2	1	3	1	1	2	3	2	2
CO4	3	3	2	3	1	2	2	1	3	1	1	2	3	2	2
CO5	3	3	2	3	2	2	2	1	3	1	1	2	3	2	2
AVG	2.8	2.6	1.6	3	1.2	2	2	1	3	1	1	2	2.6	2	2

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	II	SEM	04	SUBJECT CODE	CE3413
SUBJECT	SOIL MECHANICS LABORATORY				

The students will be able to:

CO1	Determine the Index Properties
CO2	Determine the Insitu density and compaction characteristics
CO3	Determination of Engineering Properties
CO4	Determine the test on Geosynthetics
CO5	Determine the strength of brick and wood.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO1	2	2	3	3	1	1	1	1	3	1	1	3	3	3	3
CO2	1	2	3	3	1	1	1	1	3	2	1	3	2	3	2
CO3	3	3	3	3	1	1	1	1	3	1	1	3	2	3	3
CO4	1	2	2	3	2	1	1	1	3	1	1	3	2	2	3
CO5	1	2	3	3	1	1	1	1	3	1	1	3	2	3	3
AVG	1.6	2.2	3	3	1.2	1	1	1	3	1.2	1	3	2	2.8	2.8

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	III	SEM	05	SUBJECT CODE	CE3501
SUBJECT	DESIGN OF REINFORCED CEMENT CONCRETE ELEMENTS				

The students will be able to:

CO1	Understand the various design methodologies for the design of rc elements.
CO2	Analysis and design of flanged beams by limit state method and sign of beams for shear, bond and torsion.
CO3	Design the various types of slabs and staircase by limit state method.
CO4	Design columns for axial, uniaxial and biaxial eccentric loadings.
CO5	Design of footing by limit state method.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	1	3	1	1	3	2	1	2	3	3	3
CO2	3	3	3	3	1	3	1	1	3	2	1	2	3	3	3
CO3	3	3	3	3	1	3	1	1	3	2	1	2	3	3	3
CO4	3	3	3	3	1	3	1	1	3	2	1	2	3	3	3
CO5	3	3	3	3	1	3	1	1	3	2	1	2	3	3	3
AVG	3	3	3	3	1	3	1	1	3	2	1	2	3	3	3

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	III	SEM	05	SUBJECT CODE	CE3502
SUBJECT	STRUCTURAL ANALYSIS I				

The students will be able to:

CO1	Analyze continuous beams, pin-jointed indeterminate plane frames and rigid plane frames by strain energy method
CO2	Analyse the continuous beams and rigid frames by slope defection method.
CO3	Understand the concept of moment distribution and analysis of continuous beams and rigid frames with and without sway.
CO4	Analyse the indeterminate pin jointed plane frames continuous beams and rigid frames using matrix flexibility method.
CO5	Understand the concept of matrix stiffness method and analysis of continuous beams, pin jointed trusses and rigid plane frames.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	1	3	1	1	3	2	1	2	3	3	3
CO2	3	3	3	3	1	3	1	1	3	2	1	1	3	3	3
CO3	3	3	3	3	1	3	1	1	3	2	1	1	3	3	3
CO4	3	3	3	3	1	3	1	1	3	2	1	1	3	3	3
CO5	3	3	3	3	1	3	1	1	3	2	1	1	3	3	3
AVG	3	3	3	3	1	3	1	1	3	2	1	1.2	3	3	3

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	III	SEM	05	SUBJECT CODE	EN8491
SUBJECT	WATER SUPPLY ENGINEERING				

The students will be able to:

CO1	Explain the structure of drinking water supply systems, including water transport, treatment and distribution
CO2	Apply the knowledge in various unit operations and processes in water treatment
CO3	Design the various functional units in water treatment
CO4	Understand the water quality criteria and standards, and their relation to public health
CO5	Design and evaluate water supply project alternatives on basis of chosen

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	1	3	1	-	2	1	3	2	2	3	3	-
CO2	2	3	-	1	3	1	-	2	1	3	2	2	3	3	-
CO3	2	3	-	2	3	1	3	2	1	3	2	2	3	3	3
CO4	2	3	-	2	3	1	3	2	1	3	2	2	3	3	3
CO5	2	3	-	2	3	1	2	2	1	3	2	2	3	3	-
AVG	2	3	0.4	1.6	3	1	1.6	2	1	3	2	2	2	3	1.2

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	III	SEM	05	SUBJECT CODE	CE 3503
SUBJECT	FOUNDATION ENGINEERING				

The students will be able to:

CO1	Understand the site investigation, methods and sampling.
CO2	Determine the bearing capacity and testing methods.
CO3	Design shallow footings.
CO4	Determine the load carrying capacity, settlement of pile foundation.
CO5	Determine the earth pressure on retaining walls and analysis for stability.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO1	2	3	3	3	1	2	1	1	1	1	1	3	3	2	3
CO2	2	3	3	3	1	2	2	1	1	1	1	3	2	3	2
CO3	2	3	3	3	1	2	1	1	1	1	2	3	2	3	2
CO4	3	3	3	3	1	1	1	1	1	1	2	3	2	3	3
CO5	3	3	3	3	1	2	1	1	1	1	2	3	2	3	3
AVG	2.4	3	3	3	1	1.8	1.2	1	1	1	1.6	3	2.2	2.8	2.6

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	III	SEM	05	SUBJECT CODE	GI8013
SUBJECT	ADVANCED SURVEYING				

The students will be able to:

CO1	Know the astronomical surveying
CO2	Analyze the photogrammetric surveying and interpretation
CO3	Solve the field problems with Total station
CO4	Know the GPS surveying and the data processing
CO5	Understand the route surveys and tunnel alignments

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	2	-	-	-	-	-	-	-	2	2	-
CO2	3	3	3	2	2	-	-	-	-	-	-	-	1	1	-
CO3	3	3	3	1	-	-	-	-	-	-	-	-	1	1	1
CO4	3	3	3	1	-	-	-	-	-	-	-	-	2	2	2
CO5	3	3	1	2	-	-	-	-	-	-	-	-	1	1	-
AVG	3	3	2.4	1.6	0.8	-	-	-	-	-	-	-	1.4	1.4	0.6

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	III	SEM	05	SUBJECT CODE	CE3511
SUBJECT	HIGHWAY ENGINEERING LABORATORY				

The students will be able to:

CO1	Determine the Pavement Aggregate through relevant test.
CO2	Explain the Quality of Bitumen.
CO3	Determine the Optimum Binder Content Using Marshall Method.
CO4	Evaluate the Consistency and Properties of Bitumen.
CO5	Determine the Bitumen Content in the Bituminous Mixes

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	3	2	1	1	1	1	3	3	1	3	3	3	2
CO2	3	1	3	2	1	1	1	1	3	3	1	3	3	3	2
CO3	3	1	3	2	1	1	1	1	3	3	1	3	3	3	2
CO4	3	1	3	2	1	1	1	1	3	3	1	3	3	3	2
CO5	3	1	3	2	1	1	1	1	3	3	1	3	3	3	2
AVG	3	1	3	2	1	1	1	1	3	3	1	3	3	3	2

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	III	SEM	05	SUBJECT CODE	CE3512
SUBJECT	SURVEY CAMP				

The students will be able to:

CO1	Handle the modern surveying instruments like Total station and GPS
CO2	Apply modern surveying techniques in field to establish horizontal control
CO3	Understand the surveying techniques in field to establish vertical control
CO4	Apply different survey adjustment techniques
CO5	Carry out different setting out works in the field

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO1	3	3	-	3	3	3	2	2	2	2	2	3	3	3	3
CO2	3	3	-	3	3	3	2	2	2	2	2	3	3	3	3
CO3	3	3	2	3	3	2	2	2	3	2	2	3	3	3	3
CO4	3	3	2	-	3	2	2	2	2	2	2	3	3	3	3
CO5	3	3	2	-	3	2	2	-	2	2	2	3	3	3	3
AVG	3	3	1.2	1.8	3	2.4	2	1.6	2.2	2	2	3	3	3	3

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	III	SEM	06	SUBJECT CODE	CE3601
SUBJECT	DESIGN OF STEEL STRUCTURAL ELEMENTS				

The students will be able to:

CO1	Design philosophy of steel structures and identify the different failure modes of bolted and welded connections, and determine their design strengths
CO2	Analyse the most suitable section shape and size for tension and compression members and beams according to specific design criteria
CO3	Apply the principles, procedures and current code requirements to the analysis and design of steel tension members, columns, column bases and beams
CO4	Identify and compute the design loads on Industrial structures, and gantry girder
CO5	Design the ultimate load of steel beams and portal frames using plastic analysis

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	3	-	-	-	2	-	-	-	-	2	3	2	-
CO2	2	2	3	-	2	-	-	-	-	-	2	2	2	2	-
CO3	2	2	3	-	2	-	-	-	-	-	2	2	2	2	-
CO4	3	2	3	-	2	2	2	2	2	-	2	3	2	2	3
CO5	2	3	3	2	-	-	-	-	-	1	-	3	2	2	3
AVG	2.2	2.2	3	0.4	1.2	0.4	0.8	0.4	0.4	0.2	1.2	2.4	2.2	2	1.2

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	III	SEM	06	SUBJECT CODE	CE3602
SUBJECT	STRUCTURAL ANALYSIS II				

The students will be able to:

CO1	Determine influence lines for statically determinate structures and calculate critical stress resultants.
CO2	Understand Muller Breslau principle and draw the influence lines for statically indeterminate beams.
CO3	Analyse three hinged, two hinged and fixed arches.
CO4	Analyse the suspension bridges with stiffening girders
CO5	Analys HYDe rigid frames by approximate methods for gravity and horizontal loads.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	1	3	1	1	3	2	1	2	3	3	3
CO2	3	3	3	3	1	3	1	1	3	2	1	1	3	3	3
CO3	3	3	3	3	1	3	1	1	3	2	1	1	3	3	3
CO4	3	3	3	3	1	3	1	1	3	2	1	1	3	3	3
CO5	3	3	3	3	1	3	1	1	3	2	1	1	3	3	3
AVG	3	3	3	3	1	3	1	1	3	2	1	1.2	3	3	3

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	III	SEM	06	SUBJECT CODE	AG3601
SUBJECT	ENGINEERING GEOLOGY				

The students will be able to:

CO1	Know the internal structure of earth and its relation to earthquakes. Landforms created by various geological agents and their importance in civil engineering.
CO2	Understand the various minerals and rocks that can be used as construction materials and road aggregates. In addition, testing the suitability of rocks for foundation purposes.
CO3	Determine the various geological structures and their impact in engineering constructions. Further, learning the geomechanical properties of rocks and their significance in engineering projects.
CO4	Apply the role of geological mapping, remote sensing and geophysics for surface and subsurface investigations. In addition, students will also gain knowledge on borehole logging techniques and their applications in civil engineering.
CO5	Applying geological knowledge for designing and constructing major civil engineering structures, and also mitigating various geological hazards such as earthquakes, landslides and tsunamis

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	2	-	2	-	-	-	-	-
CO2	2	-	-	2	2	2	-	-	-	-	-	-	2	-	-
CO3	2	2	3	3	-	2	-	-	-	-	-	-	-	-	2
CO4	-	2	-	3	2	-	-	2	2	2	2	2	2	2	-
CO5	-	3	3	3	-	2	1	2	2	2	2	2	2	2	2
AVG	1.2	1.4	1.2	2.2	0.8	1.2	0.2	1.2	0.8	1.2	0.8	0.8	1.2	0.8	0.8

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	III	SEM	06	SUBJECT CODE	CE3611
SUBJECT	BUILDING DRAWING LABORATORY				

The students will be able to:

CO1	Draft the plan, elevation and sectional view of the load bearing and framed buildings
CO2	Draw the structural detailing of RCC elements
CO3	Draw the structural detailing of RCC water tanks, footings and retaining walls
CO4	Draw the structural detailing of steel structures
CO5	Draft the structural detailing of Industrial structures

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	2	-	-	1	-	-	-	1	3	2	-
CO2	3	2	-	-	2	3	-	2	3	2	-	2	3	2	2
CO3	3	2	-	-	2	3	-	2	3	2	-	2	3	2	2
CO4	3	2	-	2	2	3	-	1	3	2	-	2	3	2	2
CO5	3	2	-	2	2	3	-	2	3	2	-	2	3	2	2
AVG	3	0.8	-	0.8	2	2.4	-	1.6	2.4	1.6	-	1.8	3	2	1.6

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	IV	SEM	07	SUBJECT CODE	CE3701
SUBJECT	ESTIMATION, COSTING AND VALUATION ENGINEERING				

The students will be able to:

CO1	Explain the types of contracts
CO2	Know the types of specifications, principles for report preparation, tender notices types.
CO3	Analyse all Building works, canals, and Roads and Cost Estimate
CO4	Estimate the quantities for buildings.
CO5	Evaluate valuation for building and land.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	2	-	-	1	-	-	-	1	3	2	-
CO2	3	2	-	-	2	3	-	2	3	2	-	2	3	2	2
CO3	3	2	-	-	2	3	-	2	3	2	-	2	3	2	2
CO4	3	2	-	2	2	3	-	1	3	2	-	2	3	2	2
CO5	3	2	-	2	2	3	-	2	3	2	-	2	3	2	2
AVG	3	0.8	-	0.8	2	2.4	-	1.6	2.4	1.6	-	1.8	3	2	1.6

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	IV	SEM	07	SUBJECT CODE	AI3404
SUBJECT	HYDROLOGY AND WATER RESOURCES ENGINEERING				

The students will be able to:

CO1	Define the hydrological processes and their integrated behaviour in catchments
CO2	Apply the knowledge of hydrological processes to address basin characteristics, runoff andhydrograph
CO3	Explain the concept of hydrological extremes and its management strategies
CO4	Describe the principles of storage reservoirs
CO5	Understand and apply the concepts of groundwater management

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	2	1	2	2	-	2	2	-	2	2	2	2
CO2	2	3	2	2	1	1	2	-	3	2	-	2	2	2	2
CO3	2	2	2	1	-	2	2	-	2	2	2	2	2	2	2
CO4	2	2	1	1	1	3	2	2	2	2	-	3	2	2	3
CO5	2	2	2	2	1	2	2	2	3	2	2	3	2	2	3
AVG	2	2.2	1.4	1.6	0.8	2	2	0.8	2.4	2	0.8	2.4	2	2	2.4

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	IV	SEM	07	SUBJECT CODE	GE3791
SUBJECT	HUMAN VALUES AND ETHICS				

The students will be able to:

CO1	Identify the importance of democratic, secular and scientific values in harmonious functioningof social life
CO2	Practice democratic and scientific values in both their personal and professional life.
CO3	Behave in an ethical manner in society
CO4	Find rational solutions to social problems.
CO5	Practice critical thinking and the pursuit of truth.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	1	1	3	-	2	-	1	3	-	1
CO2	-	-	-	-	-	1	1	3	1	2	-	-	2	1	-
CO3	-	-	1	-	-	3	2	3	-	-	3	-	-	2	3
CO4	-	-	3	2	-	3	2	2	-	1	-	2	1	1	2
CO5	-	1	3	-	-	3	2	3	2	-	3	-	-	3	1
AVG	-	0.2	1.4	0.4	-	2.2	1.6	2.8	0.6	1	1.2	0.6	1.2	1.4	1.4

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	IV	SEM	07	SUBJECT CODE	GE3752
SUBJECT	TOTAL QUALITY MANAGEMENT				

The students will be able to:

CO1	Apply TQM concepts in a selected enterprise
CO2	Apply TQM principles in a selected enterprise.
CO3	Know Six Sigma and apply Traditional tools, New tools, Benchmarking and FMEA.
CO4	Know Taguchi's Quality Loss Function, Performance Measures and applyQFD, TPM, COQ and BPR.
CO5	Apply QMS and EMS in any organization.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	3	-	-	-	-	-	-	-	-	-	3	2	-	3
CO2	-	-	-	-	-	3	-	-	-	-	-	3	-	2	-
CO3	-	-	-	-	3	-	-	-	3	-	-	-	-	2	3
CO4	-	2	-	-	3	2	-	2	-	-	-	3	3	2	-
CO5	-	-	3	-	-	3	3	2	-	-	-	-	-	-	-
AVG	-	2.5	3	-	3	2.6	3	2	3	-	-	3	2.5	2	3

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	IV	SEM	07	SUBJECT CODE	OAI351
SUBJECT	URBAN AGRICULTURE				

The students will be able to:

CO1	Demonstrate the principles behind crop production and various parameters that influencesthe crop growth on roof tops
CO2	Explain different methods of crop production on roof tops
CO3	Explain nutrient and pest management for crop production on roof tops
CO4	Illustrate crop water requirement and irrigation water management on roof tops
CO5	Explain the concept of waste management on roof tops

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	1
CO2	2	1	2	1	2	2	2	1	1	2	1	2	2	1	2
CO3	1	1	1	2	1	1	1	1	2	1	1	1	1	2	1
CO4	1	1	1	2	1	2	1	1	1	1	1	1	1	1	2
CO5	2	1	3	1	1	1	2	2	1	2	1	3	2	1	1
AVG	1.4	1	1.6	1.4	1.2	1.4	1.4	1.4	1.2	1.4	1	1.6	1.4	1.4	1.4

BETHLAHEM INSTITUTE OF ENGINEERING
KARUNGAL - 629 157, KANYAKUMARI DIST., TAMIL NADU.
(Approved by AICTE Vide : FNo. 06/05/TN/E&T/2007/25 dt. 02-06-2008 &
Affiliated to Anna University, Chennai)
Phone : 04651 - 268466, 268655, Fax : 04651 - 268466
E-mail : mail@bethlahem.org, Website : www.bethlahem.org

YEAR	IV	SEM	07	SUBJECT CODE	OHS352
SUBJECT	PROJECT REPORT WRITING				

The students will be able to:

CO1	Write effective project reports.
CO2	Use statistical tools with confidence
CO3	Explain the purpose and intension of the proposed project coherently and with clarity.
CO4	Create writing texts to suit achieve the intended purpose
CO5	Master the art of writing winning proposals and projects.

CO-PO MAPPING

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	1	1	3	2	2	3	3	3	3	-	-	-
CO2	2	2	2	1	1	1	2	1	2	3	2	3	-	-	-
CO3	2	2	3	3	2	3	2	2	2	3	2	3	-	-	-
CO4	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-
CO5	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-
AVG	2.4	2.2	2.4	2.2	2	2.6	2.4	2.2	2.6	3	2.6	3	-	-	-