



Indra Ganesan

COLLEGE OF ENGINEERING

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Accredited by NAAC with 'B+' Grade, 2(f) & 12B Status Institution by UGC

IG Valley, Madurai Main Road, Manikandam, Tiruchirappalli - 620012

NAAC DOCUMENTS

QUALITY INDICATOR FRAME WORK

CRITERION – 2

TEACHING-LEARNING AND EVALUATION

SUBMITTED BY

IQAC

INTERNAL QUALITY ASSURANCE CELL
INDRA GANESAN COLLEGE OF ENGINEERING





Indra Ganesan
COLLEGE OF ENGINEERING
Madurai Main Road (NH-45B), Manikandam, Tiruchirappalli - 620 012
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
NAAC Accredited, 2(F) Status Institution by UGC



Criteria 2	Teaching-Learning and Evaluation	350
-------------------	---	------------

Key Indicator-2.6 Student Performances and Learning Outcome (90)

2.6.1 Programme Outcomes (POs) and Course Outcomes (COs) for all programmes offered by the institution are stated and displayed on website

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION
ENGINEERING...R2021**

INDRA GANESAN COLLEGE OF ENGINEERING
IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

REGULATION -2021

COURSE OUTCOMES

SEM –III

C201- MA3355 Random Processes and Linear Algebra

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C201.1	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts.	1,2,9,12	-
C201.2	Demonstrate accurate and efficient use of advanced algebraic techniques.	1,2,9,12	-
C201.3	Apply the concept of random processes in engineering disciplines.	1,2,9,12	-
C201.4	Analyse the fundamental concepts of probability with a thorough knowledge of standard distributions that can describe certain real-life phenomenon.	1,2,9,12	-
C201.5	Explain the basic concepts of one and two dimensional random variables and apply them to model engineering problems	1,2,9,12	-
C201.6		1,2,9,12	-

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
C201.1	3	3	0	0	0	0	0	0	3	0	0	2	-	-	-
C201.2	3	3	0	0	0	0	0	0	3	0	0	2	-	-	-
C201.3	3	3	0	0	0	0	0	0	3	0	0	2	-	-	-
C201.4	3	3	0	0	0	0	0	0	3	0	0	2	-	-	-
C201.5	3	3	0	0	0	0	0	0	3	0	0	2	-	-	-
C201.6	3	3	0	0	0	0	0	0	3	0	0	2	-	-	-
C201	3	3	0	0	0	0	0	0	3	0	0	2	-	-	-


Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

Indra Ganesan College of Engineering
 IG Valley, Madurai Main Road
 Manikandam, Trichy-620 012.

C202- CS3353 C Programming and Data Structures

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C202.1	introduce the basics of C programming language.	1,2,3,4,6,9,10,11,12	1,3
C202.2	learn the concepts of advanced features of C.	1,2,3,4,6,9,10,11,12	1,3
C202.3	Explain the concepts of ADTs and linear data structures.	1,2,3,4,6,9,10,11,12	1,3
C202.4	know the concepts of non-linear data structure and hashing.	1,2,3,4,6,9,10,11,12	1,3
C202.5	Familiarize the concepts of sorting.	1,2,3,4,6,9,10,11,12	1,3
C202.6	Familiarize the concepts of searching techniques.	1,2,3,4,6,9,10,11,12	1,3

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
C202.1	3	3	2	2	-	1	-	-	1	2	1	1	2	-	2
C202.2	3	3	2	2	-	1	-	-	1	2	1	1	2	-	2
C202.3	3	3	2	2	-	1	-	-	1	2	1	1	2	-	2
C202.4	3	3	2	2	-	1	-	-	1	2	1	1	2	-	2
C202.5	3	3	2	2	-	1	-	-	1	2	1	1	2	-	2
C202.6	3	3	2	2	-	1	-	-	1	2	1	1	2	-	2
C202	3	3	2	2	-	1	-	-	1	2	1	1	2	-	2

C203- EC3354 Signals and Systems

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C203.1	Determine if a given system is linear/causal/stable	1,2,3,4,6,9,10,11,12	1,3
C203.2	Determine the frequency components present in a deterministic signal	1,2,3,4,5,6,12	2,3


Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikandam, Trichy-620 012.

C203.3	Characterize continuous LTI systems in the time domain and frequency domain	1,2,3,4,5,6,12	2,3
C203.4	Characterize discrete LTI systems in the time domain and frequency domain	1,2,3,4,5,6,12	2,3
C203.5	Compute the output of an LTI system in the time and frequency domains	1,2,3,4,5,6,12	2,3
C203.6	Demonstrate about the concepts of Random signals and systems and spectral density	1,2,3,4,5,6,12	2,3


Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO2 3
C203.1	3	3	3	3	3	2	-	-	-	-	-	3	-	3	1
C203.2	3	3	3	3	3	2	-	-	-	-	-	3	-	3	1
C203.3	3	3	3	3	3	2	-	-	-	-	-	3	-	3	1
C203.4	3	3	3	3	3	2	-	-	-	-	-	3	-	3	1
C203.5	3	3	3	3	3	2	-	-	-	-	-	3	-	3	1
C203.6	3	3	3	3	3	2	-	-	-	-	-	3	-	3	1
C203	3	3	3	3	3	2	-	-	-	-	-	3	-	3	1

C204- EC 3353 Electronic Devices and Circuits

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C204.1	To give a comprehensive exposure to all types of devices and circuits constructed with discrete components. This helps to develop a strong basis for building linear and digital integrated circuits	1,2,3,4,5,6,12	1,2,3
C204.2	To know the working of diode and transistor	1,2,3,4,5,6,12	1,2,3
C204.3	To analyze the frequency response of small signal amplifiers	1,2,3,4,5,6,12	1,2,3
C204.4	To design and analyze single stage and multistage amplifier circuits	1,2,3,4,5,6,12	1,2,3


 G. Balakrishnan, M.E., Ph.D.,
 Principal
 Indra Ganesan College of Engineering
 IG Valley, Madurai Main Road
 Manikandam, Trichy-620 012.

C204.5	To study about feedback amplifiers and oscillators principles	1,2,3,4,5,6,12	1,2,3
C204.6	To empathize with the analysis and design of multi vibrators	1,2,3,4,5,6,12	1,2,3

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
C204.1	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C204.2	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C204.3	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C204.4	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C204.5	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C204.6	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1
C202	3	3	3	3	2	2	-	-	-	-	-	1	2	1	1

C205- EC3351 Control Systems

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C205.1	Compute the transfer function of different physical systems.	1,2,3,4,5,6,11,12	1,2,3
C205.2	Analyse the time domain specification and calculate the steady state error	1,2,3,4,5,6,11,12	1,2,3
C205.3	Illustrate the frequency response characteristics of open loop and closed loop system response.	1,2,3,4,5,6,11,12	1,2,3
C205.4	Analyse the stability using Routh and root locus techniques.	1,2,3,4,5,6,11,12	1,2,3
C205.5	Illustrate the state space model of a physical system	1,2,3,4,5,6,11,12	1,2,3
C205.6	Analyse the concepts of sampled data control system.	1,2,3,4,5,6,11,12	1,2,3

Mapping of COs, PSOs with POs

Cours e	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C205.1	3	3	3	3	2	2	-	-	-	-	2	3	3	3
C205.2	3	3	3	3	2	2	-	-	-	-	2	3	3	3

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal

Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

C205.3	3	3	3	3	2	2	-	-	-	-	2	3	3	3
C205.4	3	3	3	3	2	2	-	-	-	-	2	3	3	3
C205.5	3	3	3	3	2	2	-	-	-	-	2	3	3	3
C205.6	3	3	3	3	2	2	-	-	-	-	2	3	3	3
C205	3	3	3	3	2	2	-	-	-	-	2	3	3	3


C206- EC3352 Digital Systems Design

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C206.1	Use Boolean algebra and simplification procedures relevant to digital logic	1,2,3,4,6,11,12	1,2,3
C206.2	Design various combinational digital circuits using logic gates	1,11,12	1,2,3
C206.3	Analyse and design synchronous sequential circuits	1,2,3,4,6,11,12	1,2,3
C206.4	Analyse and design asynchronous sequential circuits.	1,11,12	1,2,3
C206.5	Build logic gates and use programmable devices	1,2,3,4,6,11,12	1,2,3
C206.6	Describe the working of digital integrated circuits	1,2,11,12	1,2,11,12

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 0	PO 1	PO 2	PO 1	PSO 1	PSO 2	PSO 3
C206.1	3	3		1	-	2	-	-	-	-	3	3	3	3	3	2
C206.2	3	-	-	-	-	-	-	-	-	-	3	1	3	3	3	2
C206.3	3	3	3	2	-	2	-	-	-	-	3	2	3	3	3	2
C206.4	3	-	-	-	-	-	-	-	-	-	3	2	3	3	3	2
C206.5	3	3	3	3	-	2	-	-	-	-	3	2	3	3	3	2
C206.6	3	3	-	-	-	-	-	-	-	-	3	2	3	3	3	2
C206	3	2	1	1		1	-	-	-	-	3	2	3	3	3	2


Dr. G. Balakrishnan, M.E., Ph.D.,
Principal

Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 010

C207- EC3361 Electronic Devices and Circuits Laboratory

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C207.1	Characteristics of PN Junction Diode and Zener diode.	1,2,3,4,5,6,11,12	1,2,3
C207.2	Design and Testing of BJT and MOSFET amplifiers.	1,2,3,4,5,6,11,12	1,2,3
C207.3	Operation of power amplifiers.	1,2,3,4,5,6,11,12	1,2,3
C207.4	Analyze the frequency response of BJT and FET Amplifiers	1,2,5,6,11,12	1,2,3
C207.5	Analyze the frequency response of multistage Amplifiers	1,2,3,5,6,11,12	1,2,3
C207.6	Measurement of CMRR value of Differential Amplifier	1,2,3,4,5,6,11,12	1,2,3

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
C207.1	2	2	3	3	2	1	-	-	-	-	-	1	2	1	1
C207.2	2	2	3	3	2	1	-	-	-	-	-	1	2	1	1
C207.3	2	2	2	3	1	1	-	-	-	-	-	1	2	1	1
C207.4	2	2	-	-	3	1	-	-	-	-	-	1	2	1	1
C207.5	2	2	1	-	2	1	-	-	-	-	-	1	2	1	1
C207.6	2	2	3	3	2	1	-	-	-	-	-	1	2	1	1
C207	2	2	2	2	2	1	-	-	-	-	-	1	2	1	1

C208- CS3362 C Programming and Data Structures Laboratory

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
----	-----------------	-----	------


Dr. G. Balakrishnan, M.E., Ph.D.,
Principal

Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

C208.1	Use different constructs of C and develop applications	1,2,3,4,5,6,7,9,10,11,12	1,2,3
C208.2	Write functions to implement linear and non-linear data structure operations.	1,2,3,4,5,6,7,9,10,11,12	1,2,3
C208.3	Suggest and use the appropriate linear/non-linear data structure operations for a given problem	1,2,3,4,5,6,7,9,10,11,12	1,2,3
C208.4	Apply appropriate hash functions that result in a collision free scenario for data storage and Retrieval	1,2,3,4,5,6,7,9,10,11,12	1,2,3
C208.5	Implement Sorting and searching algorithms for a given application	1,2,3,4,5,6,7,9,10,11,12	1,2,3
C208.6	Implementation of Hashing	1,2,3,4,5,6,7,9,10,11,12	1,2,3

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 0	PO 1	PO 2	PS O 1	PSO 2	PS O 3
C208.1	2	3	1	2	2	1	1	-	1	2	1	3	2	2	3
C208.2	2	3	1	2	2	1	1	-	1	2	1	3	2	2	3
C208.3	2	3	1	2	3	1	1	-	1	2	1	3	2	2	3
C208.4	2	3	1-	2	1	1	1	-	1	2	1	3	2	2	3
C208.5	2	3	1	2	2	1	1	-	1	2	1	3	2	2	3
C208.6	2	3	1	2	2	1	1	-	1	2	1	3	2	2	3
C208	2	3	1	2	2	1	1	-	1	2	1	3	2	2	3

C209- GE3361 Professional Development

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C209.1	Use MSWord to create quality documents	1,2,3,4,5,6,7,9,10,11,12	1,2,3
C209.2	Use MSEXCEL to perform data operations and analytics	1,2,3,4,5,6,7,9,10,11,12	1,2,3
C209.3	Export data and sheets to other file formats Working with macros Protecting data and Securing the workbook	1,2,3,4,5,6,7,9,10,11,12	1,2,3
C209.4	Use MSPowerPoint to create high quality academic presentations by including common tables	1,2,3,4,5,6,7,9,10,11,12	1,2,3

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

C209.5	Us Slide master, notes and handout masterWorking with animation	1,2,3,4,5,6,7,9,10,11,12	1,2,3
C209.6	Import or create and use media objects audio,video,animation	1,2,3,4,5,6,7,9,10,11,12	1,2,3

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PS O1	PS O2	PS O3
C209.1	2	3	1	2	2	1	1	-	1	2	1	3	2	2	2
C209.2	2	3	1	2	2	1	1	-	1	2	1	3	2	2	2
C209.3	2	3	1	2	3	1	1	-	1	2	1	3	2	2	2
C209.4	2	3	1-	2	1	1	1	-	1	2	1	3	2	2	2
C209.5	2	3	1	2	2	1	1	-	1	2	1	3	2	2	2
C209.6	2	3	1	2	2	1	1	-	1	2	1	3	2	2	2
C209	2	3	1	2	2	1	1	-	1	2	1	3	2	2	2

C210- EC3452 Electromagnetic Fields

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C210.1	Relate the fundamentals vector, coordinate system to electromagnetic concepts.	1,2,3,4,5,6,7,11,12	2
C210.2	Analyze the characteristics of Electrostatic field.	1,2,3,4,5,6,7,10,11,12	2
C210.3	Interpret the concepts of Electric field in material space and solve the boundary	1,2,3,4,5,6,7,10,11,12	2
C210.4	Explain the concepts and characteristics of Magneto Static field in material space and solve boundary conditions.	1,2,3,4,5,6,7,10,11,12	2
C210.5	Determine the significance of time varying fields	1,2,3,4,5,6,7,10,11,12	2
C210.6	Calculation of magnetic field intensity for various current distributions Magnetic circuits.	1,2,3,4,5,6,7,10,11,12	2



Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
C210.1	2	2	3	2	2	2	1	-	-	1	-	2	-	1	-
C210.2	2	2	3	2	2	2	1	-	-	1	1	2	-	1	-
C210.3	2	2	3	2	2	2	1	-	-	1	1	2	-	1	-
C210.4	2	2	3	2	2	2	1	-	-	1	1	2	-	1	-
C210.5	2	2	3	2	2	2	1	-	-	1	1	2	-	1	-
C210.6	2	2	3	2	2	2	1	-	-	1	1	2	-	1	-
C210	2	2	3	2	2	2	1	-	-	1	1	2	-	1	-

C211- EC3401 Networks and Security

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C211.1	Explain the Network Models, layers and functions.	1,2,3,4,5,6,7,10,12	1,2,3
C211.2	Categorize and classify the routing protocols.	1,2,3,4,5,6,7,10,11,12	1,2,3
C211.3	List the functions of the transport and application layer.	1,2,3,4,5,6,7,10,11,12	1,2,3
C211.4	Evaluate and choose the network security mechanisms.	1,2,3,4,5,6,7,10,11,12	1,2,3
C211.5	Discuss the hardware security attacks and counter measures.	1,2,3,4,5,6,7,10,11,12	1,2,3
C211.6	Data encryption and decryption using RSA (Rivest, Shamir and Adleman) algorithm.	1,2,3,4,5,6,7,10,11,12	1,2,3

Mapping of COs, PSOs with POs

Cour	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO1	PO1	PO1	PSO	PSO	PSO
------	----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal

Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012

se	1	2	3	4	5	6	7	8	9	0	1	2	1	2	3
C210.1	2	2	3	2	2	2	1	-	-	1	-	2	2	2	2
C210.2	2	2	3	2	2	2	1	-	-	1	1	2	2	2	2
C210.3	2	2	3	2	2	2	1	-	-	1	1	2	2	2	2
C210.4	2	2	3	2	2	2	1	-	-	1	1	2	2	2	2
C210.5	2	2	3	2	2	2	1	-	-	1	1	2	2	2	2
C210.6	2	2	3	2	2	2	1	-	-	1	1	2	2	2	2
C210	2	2	3	2	2	2	1	-	-	1	1	2	2	2	2

C212- EC3451 Linear Integrated Circuits

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C212.1	Design linear and nonlinear applications of OP – AMPS	1,2,3,4,12	1,2,3
C212.2	Design applications using analog multiplier and PLL	1,2,3,4,12	1,2,3
C212.3	Design ADC using OP-AMPS	1,2,3,4,12	1,2,3
C212.4	Design DAC using OP-AMPS	1,2,3,4,12	1,2,3
C212.5	Generate waveforms using OP-AMP Circuits.	1,2,3,4,12	1,2,3
C212.6	Analyze special function ICs	1,2,3,4,12	1,2,3

Mapping of COs, PSOs with POs

Cour se	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
C212.1	2	2	1	1	-	-	-	-	-	-	-	-	2	1	1
C212.2	2	2	1	1	-	-	-	-	-	-	-	-	2	1	1
C212.3	2	2	1	1	-	-	-	-	-	-	-	-	2	1	1
C212.4	2	2	1	1	-	-	-	-	-	-	-	-	2	1	1
C212.5	2	2	1	1	-	-	-	-	-	-	-	3	2	1	1
C212.6	2	2	1	1	-	-	-	-	-	-	-	3	2	1	1
C212	2	2	1	1	-	-	-	-	-	-	-	1	2	1	1


Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikandam, Trichy-620 012.

C213- EC3492 Digital Signal Processing

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C213.1	Apply DFT for the analysis of digital signals and systems	1,2,3,4,5,6,11,12	1,2,3
C213.2	Design IIR and FIR filters	1,2,3,4,5,6,11,12	1,2,3
C213.3	Characterize the effects of finite precision representation on digital filters	1,2,3,4,5,6,11,12	1,2,3
C213.4	Design multirate filters	1,2,3,4,5,6,11,12	1,2,3
C213.5	Apply adaptive filters appropriately in communication systems	1,2,3,4,5,6,11,12	1,2,3
C213.6	Apply DFT for the analysis of digital signals and systems	1,2,3,4,5,6,11,12	1,2,3

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
C213.1	3	3	3	3	2	2	-	-	-	-	1	1	3	3
C213.2	3	3	3	3	2	2	-	-	-	-	1	1	2	2
C213.3	3	3	2	2	2	2	-	-	-	-	1	1	1	2
C213.4	3	3	2	2	3	1	-	-	-	-	1	1	2	2
C213.5	3	2	2	2	3	2	-	-	-	-	1	1	2	2
C213.6	3	2	2	2	3	2	-	-	-	-	1	1	2	2
C213	3	3	2	2	2	2	-	-	-	-	1	1	2	2

C214- EC3491 Communication Systems

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C214.1	Gain knowledge in amplitude modulation techniques	1,2,3,4,5,6,7,11,12	1,2,3
C214.2	Explain the concepts of Random Process to the design of communication systems	1,2,3,4,5,6,7,11,12	1,2,3
C214.3	Gain knowledge in digital techniques	1,2,3,4,5,6,7,11,12	1,2,3
C214.4	Gain knowledge in digital modulation techniques	1,2,3,4,5,6,7,11,12	1,2,3
C214.5	Gain knowledge in sampling and quantization	1,2,3,4,5,6,7,11,12	1,2,3
C214.6	Explain the importance of demodulation techniques	1,2,3,4,5,6,7,11,12	1,2,3

Mapping of COs, C, PSOs with POs

(Signature)
Dr. G. Balakrishnan, M.E., Ph.D.,
 Principal

Sri Ganesan College of Engineering
 IG Valley, Madurai Main Road
 Manikandam, Trichy-620 012

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PS O1	PS O2	PS O3
C214.1	3	3	3	3	2	1	1	-	-	-	1	1	1	1	1
C214.2	3	3	3	3	2	1	1	-	-	-	1	1	1	1	1
C214.3	3	3	3	3	3	1	1	-	-	-	1	1	1	1	1
C214.4	3	3	3	3	3	1	1	-	-	-	1	1	1	1	1
C214.5	3	3	3	3	2	1	1	-	-	-	1	1	1	1	1
C214.6	3	3	3	3	2	1	1	-	-	-	1	1	1	1	1
C214	3	3	3	3	2	1	1	-	-	-	1	1	1	1	1

C215- GE3451 Environmental Sciences and Sustainability

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C215.1	To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.	1,2,6,7,12	1,2,3
C215.2	To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society.	1,2,6,7,12	1,2,3
C215.3	To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations	1,2,3,6,7,12	1,2,3
C215.4	To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development	1,2,3,4,6,7,12	1,2,3
C215.5	To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization	1,2,6,7,12	1,2,3
C215.6	To demonstrate on Occupational Health and Safety Management system (OHSMS)	1,2,6,7,12	1,2,3

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
C215.1	3	2	1	-	-	2	2	-	-	-	-	2	1	1	1
C215.2	3	2	1	-	-	2	2	-	-	-	-	2	1	1	1

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal

Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012

C215.3	3	2	1	-	-	2	2	-	-	-	-	2	1	1	1
C215.4	3	2	1	--	-	2	2	-	-	-	-	2	1	1	1
C215.5	3	2	1	-	-	2	2	-	-	-	-	2	1	1	1
C215.6	3	2	1	-	-	2	2	-	-	-	-	2	1	1	1
C215	3	2	1	-	-	2	2	-	-	-	-	2	1	1	1

C216- GE3451 Environmental Sciences and Sustainability

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C216.1	To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.	1,2,3,6,7,12	1,2,3
C216.2	To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society	1,2,3,6,7,12	1,2,3
C216.3	To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.	1,2,3,6,7,12	1,2,3
C216.4	To recognize the different goals of sustainable development.	1,2,3,6,7,12	1,2,3
C216.5	Apply them for suitable technological advancement and societal development.	1,2,3,6,7,12	1,2,3
C216.6	To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization	1,2,3,6,7,12	1,2,3

Mapping of COs,PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C216.1	3	2	1	-	-	2	2	-	-	-	-	2	1	1	1
C216.2	3	2	1	-	-	2	2	-	-	-	-	2	1	1	1
C216.3	3	2	1	-	-	2	2	-	-	-	-	2	1	1	1
C216.4	3	2	1	-	-	2	2	-	-	-	-	2	1	1	1
C216.5	3	2	1	-	-	2	2	-	-	-	-	2	1	1	1
C216.6	3	2	1	-	-	2	2	-	-	-	-	2	1	1	1
C216	3	2	1	-	-	2	2	-	-	-	-	2	1	1	1


Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikandam, Trichy-620 012.

C217- EC3461 Communication Systems Laboratory

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C217.1	Design AM, FM & Digital Modulators for specific applications.	1,2,3,4,5,6,11,12	1,2,3
C217.2	Compute the sampling frequency for digital modulation	1,2,3,4,5,6,11,12	1,2,3
C217.3	Simulate & validate the various functional modules of Communication system	1,2,3,4,5,6,11,12	1,2,3
C217.4	Demonstrate their knowledge in base band signaling schemes through implementation of digital modulation schemes.	1,2,3,4,5,6,11,12	1,2,3
C217.5	Apply various channel coding schemes	1,2,3,4,5,6,11,12	1,2,3
C217.6	Demonstrate their capabilities towards the improvement of the noise performance of Communication system.	1,2,3,4,5,6,11,12	1,2,3

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
C216.1	3	3	3	3	3	3	-	-	-	1	1	1	1	1	1
C216.2	3	3	3	3	3	3	-	-	-	1	1	1	1	1	1
C216.3	3	3	3	3	3	3	-	-	-	1	1	1	1	1	1
C216.4	3	3	3	3	3	3	-	-	-	1	1	1	1	1	1
C216.5	3	3	3	3	3	3	-	-	-	1	1	1	1	1	1
C216.6	3	3	3	3	3	3	-	-	-	1	1	1	1	1	1
C216	3	3	3	3	3	3	-	-	-	1	1	1	1	1	1

C218- EC3462 Linear Integrated Circuits Laboratory

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C218.1	Analyze various types of feedback amplifiers	1,2,3,11,12	1,2,3
C218.2	Design oscillators, tuned amplifiers, wave-shaping circuits and multivibrators	1,2,3,11,12	1,2,3
C218.3	Design and simulate feedback amplifiers, oscillators, and tuned amplifiers using SPICETool.	1,2,3,11,12	1,2,3
C218.4	Design and simulate wave-shaping circuits and multivibrators, filters using SPICETool.	1,2,3,11,12	1,2,3
C218.5	Design amplifiers, oscillators, D-A converters using operational amplifiers.	1,2,3,11,12	1,2,3
C218.6	Design filters using op-amp and performance experiment on frequency response.	1,2,3,11,12	1,2,3

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal

Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandan, Trichy-620 012.

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
C218.1	2	3	3	3	-	-	-	-	-	-	1	1	1	1	1
C218.2	2	3	3	3	-	-	-	-	-	-	1	1	1	1	1
C218.3	2	3	3	3	-	-	-	-	-	-	1	1	1	1	1
C218.4	2	3	3	3	-	-	-	-	-	-	1	1	1	1	1
C218.5	2	3	3	3	-	-	-	-	-	-	1	1	1	1	1
C218.6	2	3	3	3	-	-	-	-	-	-	1	1	1	1	1
C218	2	3	3	3	-	-	-	-	-	-	1	1	1	1	1

C301- EC3501 Wireless Communication

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C301.1	Explain the Concept and Design of a Cellular System.	1,2,3,4,5,6,12	1,2,3
C301.2	Explain the Mobile Radio Propagation.	1,2,3,4,5,6,12	1,2,3
C301.3	Explain the various Digital Modulation Techniques.	1,2,3,4,5,6,12	1,2,3
C301.4	The Concepts of Multiple Access Techniques And Wireless Networks	1,2,3,4,5,6,12	1,2,3
C301.5	Characterize a wireless channel and evolve the system design specifications	1,2,3,4,5,6,12	1,2,3
C301.6	Design a cellular system based on resource availability and traffic demands.	1,2,3,4,5,6,12	1,2,3

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO 12	PSO1	PSO2	PSO3

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

C301.1	3	3	2	2	3	2	-	-	-	-	-	1	3	1	1
C301.2	3	3	2	2	3	2	-	-	-	-	-	1	3	1	1
C301.3	3	3	2	2	3	2	-	-	-	-	-	1	3	1	1
C301.4	3	3	2	2	3	2	-	-	-	-	-	1	3	1	1
C301.5	3	3	2	2	3	2	-	-	-	-	-	1	3	1	1
C301.6	3	3	2	2	3	2	-	-	-	-	-	1	3	1	1
C301	3	3	2	2	3	2	-	-	-	-	-	1	3	1	1

C302- EC3552 VLSI and Chip Design

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C302.1	In depth knowledge of MOS technology	1,2,3,4,11,12	1,2,3
C302.2	Explain the Combinational Logic Circuits and Design Principles	1,2,3,4,11,12	1,2,3
C302.3	Explain Sequential Logic Circuits and Clocking Strategies	1,2,3,4,11,12	1,2,3
C302.4	Explain the Memory architecture and building blocks	1,2,3,4,11,12	1,2,3
C302.5	Apply the ASIC Design Process and Testing	1,2,3,4,11,12	1,2,3
C302.6	Design using Programmable Devices (ROM, PLA, FPGA),	1,2,3,4,11,12	1,2,3

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 0	PO 1	PO 2	PSO 1	PSO 2	PSO 3
C302.1	2	2	2	2	-	-	-	-	-	-	1	2	3	3	3
C302.2	2	2	2	2	-	-	-	-	-	-	1	1	3	3	3
C302.3	2	2	2	2	-	-	-	-	-	-	1	2	3	3	3
C302.4	2	2	2	2	-	-	-	-	-	-	1	3	3	3	3
C302.5	2	2	2	2	-	-	-	-	-	-	1	2	3	3	3
C302.6	2	2	2	2	-	-	-	-	-	-	1	2	3	3	3
C302	2	2	2	2	-	-	-	-	-	-	1	2	3	3	3

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikandam, Trichy-620 012

C303 - EC3551 Transmission lines and RF Systems

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C303.1	Explain the characteristics of transmission lines and its losses.	1,2,3,,4,5,6,10,12	1,2,3
C303.2	Calculate the standing wave ratio and input impedance in high frequency transmission lines.	1,2,3,,4,5,6,10,12	1,2,3
C303.3	Analyze impedance matching by stubs using Smith Charts.	1,2,3,,4,5,6,10,12	1,2,3
C303.4	Comprehend the characteristics of TE and TM waves.	1,2,3,4,5,6,10,12	1,2,3
C303.5	Design a RF transceiver system for wireless communication	1,2,3,,4,5,6,10,12	1,2,3
C303.6	Explain the characteristics of Electronic components at RF frequency.	1,2,3,,4,5,6,10,12	1,2,3

Mapping of COs, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C303.1	3	3	3	3	2	1	-	-	-	1	-	1	2	1	1
C303.2	3	3	3	3	2	1	-	-	-	1	-	1	2	1	1
C303.3	3	3	3	3	2	1	-	-	-	1	-	1	2	1	1
C303.4	3	3	3	3	2	1	-	-	-	1	-	1	2	1	1
C303.5	3	3	3	3	2	1	-	-	-	1	-	1	2	1	1
C303.6	3	3	3	3	2	1	-	-	-	1	-	1	2	1	1
C303	3	3	3	3	2	1	-	-	-	1	-	1	2	1	1

C304 - EC366 Image Processing

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C304.1	Know the basics and fundamentals of digital image processing, such as digitization, sampling, quantization, and 2D-transforms.	1,2,3,4,5,6,12	1,2,3
C304.2	Operate on images using the techniques of smoothing, sharpening and enhancement.	1,2,3,4,5,6,12	1,2,3
C304.3	Explain the restoration concepts and filtering techniques.	1,2,3,4,5,6,12	1,2,3
C304.4	Learn the basics of segmentation and features extraction methods for color models.	1,2,3,4,5,6,12	1,2,3
C304.5	Learn the basics of compression and recognition methods for color models.	1,2,3,4,5,6,12	1,2,3
C304.6	Comprehend image compression concepts.	1,2,3,4,5,6,12	1,2,3



Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikondam, Trichy-620 012.

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
C304.1	3	3	3	2	2	2	-	-	-	-	-	2	2	2	1
C304.2	3	3	3	2	2	2	-	-	-	-	-	2	2	2	1
C304.3	3	3	2	2	2	2	-	-	-	-	-	2	2	2	1
C304.4	3	3	3	2	2	2	-	-	-	-	-	2	2	2	1
C304.5	3	3	3	3	2	2	-	-	-	-	-	2	2	2	1
C304.6	3	3	3	3	2	2	-	-	-	-	-	2	2	2	1
C304	3	3	3	3	2	2	-	-	-	-	-	2	2	2	1

C305 - EC3352 Therapeutic Equipment

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C305.1	explain the principles of cardiac assist devices.	1,2,3,4,5,6,7,12	1,2,3
C305.2	realize the need and use of extracorporeal devices, and the use of lasers in medicine.	1,2,3,4,5,6,7,12	1,2,3
C305.3	enable the students to gain knowledge on the working of therapeutic clinical equipment	1,2,3,4,5,6,7,12	1,2,3
C305.4	explain the physiology of nerve and muscle tissue stimulation	1,2,3,4,5,6,7,12	1,2,3
C305.5	Apply the principle techniques used for therapeutic ultrasound, interferential therapy and shortwave therapeutic diathermy	1,2,3,4,5,6,7,12	1,2,3
C305.6	Apply the engineering and functional operation medical therapeutic equipment	1,2,3,4,5,6,7,12	1,2,3

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
C305.1	3	3	3	3	2	3	2	-	-	-	-	2	3	3	2
C305.2	3	3	3	3	2	3	2	-	-	-	-	2	3	3	2
C305.3	3	3	3	3	2	3	2	-	-	-	-	2	3	3	2
C305.	3	3	3	3	2	3	2	-	-	-	-	2	3	3	2


Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikandam, Trichy-620 012.

4															
C305.5	3	3	3	3	2	3	2	-	-	-	-	2	3	3	2
C305.6	3	3	3	3	2	3	2	-	-	-	-	2	3	3	2
C305	3	3	3	3	2	3	2	-	-	-	-	2	3	3	2

C306- CEC345 Optical Communication & Networks

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C306.1	Realize Basic Elements In Optical Fibers, Different Modes And Configurations.	1,2,3,4,5,6,11,12	1,2,3
C306.2	Analyze The Transmission Characteristics Associated With Dispersion And Polarization Techniques.	1,2,3,4,5,6,11,12	1,2,3
C306.3	Design Optical Sources And Detectors With Their Use In Optical Communication System.	1,2,3,4,5,6,11,12	1,2,3
C306.4	Analyze the different types of noise in optical Receiver.	1,2,3,4,5,6,11,12	1,2,3
C306.5	Construct Fiber Optic Receiver Systems, Measurements And Techniques.	1,2,3,4,5,6,11,12	1,2,3
C306.6	Design Optical Communication Systems And Its Networks.	1,2,3,4,5,6,11,12	1,2,3

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C306.1	3	3	3	2	2	2	-	-	-	-	-	3	2	3	2
C306.2	3	3	3	2	2	2	-	-	-	-	-	2	2	3	2
C306.3	3	3	2	2	2	2	-	-	-	-	-	2	2	2	1
C306.4	3	3	3	2	2	2	-	-	-	-	-	2	2	2	1
C306.5	3	3	3	3	2	2	-	-	-	-	-	2	2	2	1
C306.6	3	3	3	2	2	2	-	-	-	-	-	2	2	2	1
C306	3	3	3	3	2	2	-	-	-	-	-	2	2	2	1

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikandam, Trichy-620 012.

C307- EC3561 VLSI Laboratory

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C307.1	Write HDL code for basic as well as advanced digital integrated circuit	1,2,5,11,12	1,2,3
C307.2	Import the logic modules into FPGA Boards	1,2,3,4,5,11,12	1,2,3
C307.3	Synthesize Place and Route the digital Ips	1,2,3,4,5,11,12	1,2,3
C307.4	Design, Simulate and Extract the layouts of Digital IC Blocks using EDAtools	1,2,3,4,5,11,12	1,2,3
C307.5	Design, Simulate and Extract the layouts of Analog IC Blocks using EDAtools	1,2,3,4,5,11,12	1,2,3
C307.6	Test and Verification of IC design	1,2,3,4,5,11,12	1,2,3

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
C307.1	3	3	-	-	1	-	-	-	-	-	1	1	2	3	2
C307.2	3	3	1	1	1	-	-	-	-	-	1	1	2	1	2
C307.3	3	3	2	2	1	-	-	-	-	-	1	1	2	2	2
C307.4	3	3	3	3	1	-	-	-	-	-	1	1	2	2	2
C307.5	3	3	3	3	1	-	-	-	-	-	1	1	2	2	2
C307.6	3	3	3	3	1	-	-	-	-	-	1	1	2	2	2
C307	3	3	2	2	1	-	-	-	-	-	1	1	2	2	2

C308- ET3491 Embedded Systems and IOT Design

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C308.1	Explain the architecture and features of 8051.	1,2,3,4,5	1,2,3
C308.2	Develop a model of an embedded system.	1,2,3,4,5	1,2,3


Dr. G. Balakrishnan, M.E., Ph.D.,
Principal

Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy, 620 012

C308.3	List the concepts of real time operating systems.	1,2,3,4,5	1,2,3
C308.4	Learn the architecture and protocols of IoT.	1,2,3,4,5	1,2,3
C308.5	Design an IoT based system for any application.	1,2,3,4,5	1,2,3
C308.6	Design an IoT based system for any application using Raspberry Pi	1,2,3,4,5	1,2,3

Mapping of COs,PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
C308.1	3	3	3	2	2	-	-	-	-	-	-	-	3	2	1
C308.2	3	3	3	2	2	-	-	-	-	-	-	-	3	2	1
C308.3	3	3	2	2	2	-	-	-	-	-	-	-	2	1	1
C308.4	3	3	2	2	2	-	-	-	-	-	-	-	3	3	1
C308.5	3	3	3	3	3	-	-	-	-	-	-	-	3	2	1
C308.6	3	3	3	3	3	-	-	-	-	-	-	-	3	2	1
C308	3	3	3	3	3	-	-	-	-	-	-	-	3	2	1

C309- CS3491 Artificial Intelligence and Machine Learning

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C309.1	Use appropriate search algorithms for problem solving	1.2.3.4.5.6.7.12	1,2,3
C309.2	Apply reasoning under uncertainty	1.2.3.4.5.6.7.12	1,2,3
C309.3	Build supervised learning models	1.2.3.4.5.6.7.12	1,2,3
C309.4	Build ensembling and unsupervised models	1.2.3.4.5.6.7.12	1,2,3
C309.5	Build deep learning neural network models	1.2.3.4.5.6.7.12	1,2,3
C309.6	Implement clustering algorithms	1.2.3.4.5.6.7.12	1,2,3

Mapping of COs, PSOs with POs

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
C309.1	3	2	2	3	1	3	2	-	-	-	-	1	3	3	3
C309.2	3	2	2	3	1	3	2	-	-	-	-	1	3	3	3
C309.	1	2	1	3	1	3	2	-	-	-	-	1	3	3	3

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal

Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 022

3															
C309.4	1	2	3	1	3	3	2	-	-	-	-	1	3	3	3
C309.5	2	2	2	1	3	3	2	-	-	-	-	1	3	3	3
C309.6	2	2	2	1	3	3	2	-	-	-	-	1	3	3	3
C309	2	2	2	2	2	3	2	-	-	-	-	1	3	3	3



Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.