



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 AGRICULTURAL ENGINEERING
R 2021

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)

AGRICULTURAL ENGINEERING

Regulation 2021

SEMESTER II

C113: AI3301- PRINCIPLES AND PRACTICES OF CROP PRODUCTION

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C113.1	Explain the basic principles of crop production.	1,2,3,4,5,6,7,11,12	3,2
C113.2	Identify suitable crops and decide upon its establishment procedures	1,2,3,4,5,6,7,11,12	3,2
C113.3	Analyse the different crop management practices	1,2,3,4,5,6,7,11,12	3,2
C113.4	Discuss the required knowledge in the area of production of agricultural and horticultural crops.	1,2,3,4,5,6,7,11,12	3,2
C113.5	Explain the production practices of agricultural and horticultural crops.	1,2,3,4,5,6,7,11,12	3,2
C113.6	Illustrate the role of agricultural engineers in relation to various crop production practices.	1,2,3,4,5,6,7,11,12	3,2

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C113.1	3	2	1	1	-	-	-	-	-	2	1	3	3	2
C113.2	3	2	1	1	-	-	-	-	-	2	1	3	3	2
C113.3	3	2	1	1	-	-	-	-	-	2	1	3	3	2
C113.4	3	2	1	1	2	2	-	-	-	2	1	3	3	2
C113.5	3	2	1	1	2	2	-	-	-	2	1	3	3	2
C113.6	3	2	1	1	2	2	-	-	-	2	1	3	3	2
C113	3	2	1	1	2	2	-	-	-	2	1	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.

SEMESTER-III

C202: AI3301- PRINCIPLES OF SOIL SCIENCE AND ENGINEERING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C202.1	Illustrate the fundamental knowledge of soil physical parameters	1,2,3,4,5,6,7,11,12	2,1
C202.2	Perform soil survey and classify soil based on its characteristics	1,2,3,4,5,6,7,11,12	2,1
C202.3	Explain the phase relationship and soil compaction	1,2,3,4,5,6,7,11,12	2,1
C202.4	Analyze Engineering properties of soil	1,2,3,4,5,6,7,11,12	2,1
C202.5	Discuss the concepts of bearing capacity and slope stability.	1,2,3,4,5,6,7,11,12	2,1
C202.6	Elaborate the Soil physical parameters, Permeability Compaction and Bearing Capacity	1,2,3,4,5,6,7,11,12	2,1

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C202.1	3	3	2	1	1	1	-	-	-	3	1	1	2	2
C202.2	3	3	2	1	1	1	-	-	-	3	1	1	2	2
C202.3	3	3	2	1	1	1	-	-	-	3	1	1	2	2
C202.4	3	3	2	1	1	1	-	-	-	3	1	1	2	2
C202.5	3	3	2	1	1	1	-	-	-	3	1	1	2	2
C202.6	3	3	2	1	1	1	-	-	-	3	1	1	2	2
C202	3	3	2	1	1	1	-	-	-	3	1	1	2	2



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

C203: AI3302 UNIT OPERATIONS IN AGRICULTURAL ENGINEERING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C203.1	Examine the evaporation process and types of evaporators for food industry	1,2,3,4,5,6,7,10,11,12	1,1
C203.2	Analyze the principles of filtration and mechanical separation equipment	1,2,3,4,5,6,7,10,11,12	1,1
C203.3	Identify size reduction and grinding equipment and understand the factors affecting the process	1,2,3,4,5,6,7,10,11,12	1,1
C203.4	Identify the gas-liquid and solid-liquid equilibrium concepts and factors influencing equilibrium separation process	1,2,3,4,5,6,7,10,11,12	1,1
C203.5	Differentiate crystallization and distillation processes and identify processing equipment	1,2,3,4,5,6,7,10,11,12	1,1
C203.6	Explain the crystallization and distillation in processing of agricultural produce.	1,2,3,4,5,6,7,10,11,12	1,1

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C203.1	3	3	1	1	1	1	1	-	-	3	1	1	2	2
C203.2	3	3	1	1	1	1	1	-	-	3	1	1	2	2
C203.3	3	3	1	1	1	1	1	-	-	3	1	1	2	2
C203.4	3	3	1	1	1	1	1	-	-	3	1	1	2	2
C203.5	3	3	1	1	1	1	1	-	-	3	1	1	2	2
C203.6	3	3	1	1	1	1	1	-	-	3	1	1	2	2
C203	3	3	1	1	1	1	1	-	-	3	1	1	2	2


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

Principal

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

C204: AI3303 - FLUID MECHANICS AND PUMPS

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C204.1	Demonstrate the properties of fluid and its behaviour in static conditions along with pressure measurements	1,2,3,4,5,6,7,8,9,10,11,12	3,2
C204.2	Apply the conservation laws applicable to fluid flows and its application through fluid kinematics and dynamics	1,2,3,4,5,6,7,8,9,10,11,12	3,3
C204.3	Estimate losses in pipelines for both laminar and turbulent conditions and analysis of pipes connected in series and parallel and to illustrate the concept of application of dimensional analysis in model studies	1,2,3,4,5,6,7,8,9,10,11,12	3,3
C204.4	Describe the basics characteristics of open channel flows and analysis of steady uniform flow with hydraulically efficient channel sections and to measure the flows in artificial/natural channels.	1,2,3,4,5,6,7,8,9,10,11,12	3,3
C204.5	Explain the classification, design and working principles of various pumps	1,2,3,4,5,6,7,8,9,10,11,12	3,3
C204.6	Illustrate the classification of pumps the basic principles of working and to design centrifugal pump.	1,2,3,4,5,6,7,8,9,10,11,12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C204.1	3	3	3	2	3	2	2	3	2	2	1	1	3	3
C204.2	3	3	3	2	3	2	2	3	2	2	1	1	3	3
C204.3	3	3	3	2	3	2	2	3	2	2	1	1	3	3
C204.4	3	3	3	2	3	2	2	3	2	2	1	1	3	3
C204.5	3	3	3	2	3	2	2	3	2	2	1	1	3	3
C204.6	3	3	3	2	3	2	2	3	2	2	1	1	3	3
C204	3	3	3	2	3	2	2	3	2	2	1	1	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: ME3491-THEORY OF MACHINES

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C205.1	Discuss the basics of mechanism	1,2,3,4,5,8,10,11,12	3,1
C205.2	Applying the basic concepts of toothed gearing and kinematics of gear trains.	1,2,3,4,5,8,10,11,12	3,1
C205.3	Examine friction in machine elements	1,2,3,4,5,8,10,11,12	3,1
C205.4	Calculate static and dynamic forces of mechanisms	1,2,3,4,5,8,10,11,12	3,1
C205.5	Calculate the balancing masses and their locations of reciprocating and rotating masses.	1,2,3,4,5,8,10,11,12	3,1
C205.6	Compute the frequency of free vibration, forced vibration and damping coefficient	1,2,3,4,5,8,10,11,12	3,1

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C205.1	3	2	2	1	2	-	-	1	-	2	1	1	3	1
C205.2	3	2	2	1	2	-	-	1	-	2	1	1	3	1
C205.3	3	2	2	1	2	-	-	1	-	2	1	1	3	1
C205.4	3	2	2	1	2	-	-	1	-	2	1	1	3	1
C205.5	3	2	2	1	2	-	-	1	-	2	1	1	3	1
C205.6	3	2	2	1	2	-	-	1	-	2	1	1	3	1
C205	3	2	2	1	2	-	-	1	-	2	1	1	3	1

C206: CE3351-SURVEYING AND LEVELLING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C206.1	Explain the rudiments of various surveying and its principles	1,2,3,4,5,6,8,9,10,11,12	3,3
C206.2	Discuss the computation of levels of terrain and ground features	1,2,3,4,5,6,8,9,10,11,12	3,3
C206.3	Elaborate the concepts of Theodolite Surveying for complex surveying operations	1,2,3,4,5,6,8,9,10,11,12	3,3
C206.4	Illustrate the procedure for establishing horizontal and vertical control	1,2,3,4,5,6,8,9,10,11,12	3,3
C206.5	Explain on modern surveying instruments	1,2,3,4,5,6,8,9,10,11,12	3,3
C206.6	Introduce the basics of Astronomical Surveying	1,2,3,4,5,6,8,9,10,11,12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C206.1	3	3	2	2	3	3	-	2	2	1	1	1	3	3
C206.2	3	3	2	2	3	3	-	2	2	1	1	1	3	3
C206.3	3	3	2	2	3	3	-	2	2	1	1	1	3	3
C206.4	3	3	2	2	3	3	-	2	2	1	1	1	3	3
C206.5	3	3	2	2	3	3	-	2	2	1	1	1	3	3
C206.6	3	3	2	2	3	3	-	2	2	1	1	1	3	3
C206	3	3	2	2	3	3	-	2	2	1	1	1	3	3



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

Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikandam, Trichy-620 012.

C207:AI3311-FLUID MECHANICS LABORATORY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C207.1	Apply Bernoulli equation for calibration of flow measuring devices	1-12	2,1
C207.2	Measure friction factor in pipes and compare with Moody diagram	1-12	3,1
C207.3	Determine the performance characteristics of roto dynamic pumps	1-12	3,2
C207.4	Determine the performance characteristics of positive displacement pumps	1-12	3,2
C207.5	Determine the mean velocity of pitot tube	1-12	3,1
C207.6	Determine the performance characteristics of submergible pumps	1-12	3,2

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C207.1	3	3	3	3	1	2	1	2	1	2	1	2	3	1
C207.2	3	3	3	3	1	2	1	2	1	2	1	2	3	1
C207.3	3	3	3	3	1	2	1	2	1	2	1	2	3	1
C207.4	3	3	3	3	1	2	1	2	1	2	1	2	3	1
C207.5	3	3	3	3	1	2	1	2	1	2	1	2	3	1
C207.6	3	3	3	3	1	2	1	2	1	2	1	2	3	1
C207	3	3	3	3	1	2	1	2	1	2	1	2	3	1



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

C208: AI 3312 -SOIL SCIENCE LABORATORY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C208.1	Explain soil physical properties and compare the properties based on soil and water system	1,2,3,4,5,6,7,9,10,11,12	2,2
C208.2	Analyse the soil chemical properties to classify the arable and problem soils to develop different reclamation practices	1,2,3,4,5,6,7,9,10,11,12	2,2
C208.3	Explain the textural analysis of soil by International Pipette method	1,2,3,4,5,6,7,9,10,11,12	2,2
C208.4	Determine the Grain size analysis by using Mechanical shaker	1,2,3,4,5,6,7,9,10,11,12	2,2
C208.5	Determine of Organic carbon	1,2,3,4,5,6,7,9,10,11,12	2,2
C208.6	Estimate of Gypsum requirements	1,2,3,4,5,6,7,9,10,11,12	2,2

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C208.1	2	1	1	1	2	1	1	-	1	2	1	1	3	1
C208.2	2	1	1	1	2	1	1	-	1	2	1	1	3	1
C208.3	2	1	1	1	2	1	1	-	1	2	1	1	3	1
C208.4	2	1	1	1	2	1	1	-	1	2	1	1	3	1
C208.5	2	1	1	1	2	1	1	-	1	2	1	1	3	1
C208.6	2	1	1	1	2	1	1	-	1	2	1	1	3	1
C208	2	1	1	1	2	1	1	-	1	2	1	1	3	1



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

C209: CE3361 SURVEYING AND LEVELLING LABORATORY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C209.1	Explain the usage of basic surveying instruments like chain/tape, compass and levelling instruments	1-12	3,3
C209.2	Elaborate the levelling instrument for surveying operations	1-12	3,3
C209.3	Discuss the use of theodolite for various surveying operations	1-12	3,3
C209.4	Illustrate the necessary surveys for social infrastructures	1-12	3,3
C209.5	Explain to prepare planimetric maps	1-12	3,3
C209.6	Determine the distance and difference in elevation between two inaccessible points using Total station	1-12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C209.1	3	3	3	2	3	3	3	2	3	3	3	1	3	1
C209.2	3	3	3	2	3	3	3	2	3	3	3	1	3	1
C209.3	3	3	3	2	3	3	3	2	3	3	3	1	3	1
C209.4	3	3	3	2	3	3	3	2	3	3	3	1	3	1
C209.5	3	3	3	2	3	3	3	2	3	3	3	1	3	1
C209.6	3	3	3	2	3	3	3	2	3	3	3	1	3	1
C209	3	3	3	2	3	3	3	2	3	3	3	1	3	1



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

Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikandam, Trichy-620 012.

C210: GE3361 - PROFESSIONAL DEVELOPMENT

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C210.1	Explain MS Word to create quality documents, by structuring	1,2,3,4,7,9,10,11,12	1,1
C210.2	Explain organizing content for their day to day technical and academic requirements	1,2,3,4,7,9,10,11,12	1,1
C210.3	Discuss MS EXCEL to perform data operations and analytics, record.	1,2,3,4,7,9,10,11,12	1,1
C210.4	Discuss about excel to retrieve data as per requirements and visualize data for ease of understanding	1,2,3,4,7,9,10,11,12	1,1
C210.5	Elaborate MS PowerPoint to create high quality academic presentations.	1,2,3,4,7,9,10,11,12	1,1
C210.6	Elaborate PPT to include common tables, charts, graphs, interlinking other elements, and using media objects	1,2,3,4,7,9,10,11,12	1,1

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C210.1	3	2	1	1	-	-	1	-	1	2	1	1	3	1
C210.2	3	2	1	1	-	-	1	-	1	2	1	1	3	1
C210.3	3	2	1	1	-	-	1	-	1	2	1	1	3	1
C210.4	3	2	1	1	-	-	1	-	1	2	1	1	3	1
C210.5	3	2	1	1	-	-	1	-	1	2	1	1	3	1
C210.6	3	2	1	1	-	-	1	-	1	2	1	1	3	1
C210	3	2	1	1	-	-	1	-	1	2	1	1	3	1


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

SEMESTER-IV

C311:AI3401-TRACTORS AND ENGINE SYSTEMS

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C211.1	Explain about the various machinery available for farm mechanization	1,2,3,4,5,8,10,11,12	3,3
C211.2	Calculate the valve timing of an IC engine and represent by a drawing	1,2,3,4,5,8,10,11,12	3,3
C211.3	Elaborate on the transmission system of a tractor	1,2,3,4,5,8,10,11,12	3,3
C211.4	Illustrate the hydraulic system in a tractor and estimate the traction	1,2,3,4,5,8,10,11,12	3,3
C211.5	Discuss on power tillers, bulldozers working principles and its components.	1,2,3,4,5,8,10,11,12	3,3
C211.6	Explain about the different tractor testing procedures	1,2,3,4,5,8,10,11,12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C211.1	3	3	3	2	3	-	-	2	-	1	1	2	3	3
C211.2	3	3	3	2	3	-	-	2	-	1	1	2	3	3
C211.3	3	3	3	2	3	-	-	2	-	1	1	2	3	3
C211.4	3	3	3	2	3	-	-	2	-	1	1	2	3	3
C211.5	3	3	3	2	3	-	-	2	-	1	1	2	3	3
C211.6	3	3	3	2	3	-	-	2	-	1	1	2	3	3
C211	3	3	3	2	3	-	-	2	-	1	1	2	3	3



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

C 212:AI3402 SOIL AND WATER CONSERVATION ENGINEERING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C212.1	Discuss the concepts of erosion and sedimentation	1 - 12	2,2
C212.2	Explain about evolution of Universal Soil Loss Equation: and its applications	1 - 12	2,2
C212.3	Explain and design erosion control measures types and design specifications	1 - 12	2,2
C212.4	Illustrate on soil and water conservation measures	1 - 12	2,2
C212.5	Discuss on reservoir sedimentation and sediment control methods	1 - 12	2,2
C212.6	Elaborate about the water conservation principles and techniques.	1 - 12	2,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C212.1	2	2	2	1	2	2	2	2	1	2	2	2	3	1
C212.2	2	2	2	1	2	2	2	2	1	2	2	2	3	1
C212.3	2	2	2	1	2	2	2	2	1	2	2	2	3	1
C212.4	2	2	2	1	2	2	2	2	1	2	2	2	3	1
C212.5	2	2	2	1	2	2	2	2	1	2	2	2	3	1
C212.6	2	2	2	1	2	2	2	2	1	2	2	2	3	1
C212	2	2	2	1	2	2	2	2	1	2	2	2	3	1



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

Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikandam, Trichy-620 012

C213- AI 3403 - STRENGTH OF MATERIALS FOR AGRICULTURAL ENGINEERING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C213.1	Examine the stress distribution and strains in regular and composite structures subjected to axial loads.	1,2,3,4,6,10,11,12	3,3
C213.2	Evaluate the stresses in plane trusses	1,2,3,4,6,10,11,12	3,3
C213.3	Explain the shear force, bending moment and bending stresses in beams	1,2,3,4,6,10,11,12	3,3
C213.4	Apply torsion equation in design of circular shafts and helical springs	1,2,3,4,6,10,11,12	3,3
C213.5	Evaluate the slope and deflection of beams and buckling loads of columns under different boundary conditions	1,2,3,4,6,10,11,12	3,3
C213.6	Discuss the stresses developed in bars, compound, bars, beams, shafts, cylinders and spheres.	1,2,3,4,6,10,11,12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C213.1	3	2	2	1	-	1	-	-	-	2	1	1	3	3
C213.2	3	2	2	1	-	1	-	-	-	2	1	1	3	3
C213.3	3	2	2	1	-	1	-	-	-	2	1	1	3	3
C213.4	3	2	2	1	-	1	-	-	-	2	1	1	3	3
C213.5	3	2	2	1	-	1	-	-	-	2	1	1	3	3
C213.6	3	2	2	1	-	1	-	-	-	2	1	1	3	3
C213	3	2	2	1	-	1	-	-	-	2	1	1	3	3



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

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

C214 AI 3404- HYDROLOGY AND WATER RESOURCES ENGINEERING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C214.1	Define the hydrological processes and their integrated behavior in catchments	1,2,3,4,5,6,7,9,10,11,12	2,2
C214.2	Apply the hydrological processes to address basin characteristics, runoff and hydrograph	1,2,3,4,5,6,7,9,10,11,12	2,2
C214.3	Explain the concept of hydrological extremes and its management strategies	1,2,3,4,5,6,7,9,10,11,12	2,2
C214.4	Describe the principles of storage reservoirs	1,2,3,4,5,6,7,8,9,10,11,12	2,2
C214.5	Illustrate and apply the concepts of groundwater management	1,2,3,4,5,6,7,8,9,10,11,12	2,2
C214.6	Discuss the concepts of hydrological processes, hydrological extremes and groundwater.	1,2,3,4,5,6,7,9,10,11,12	2,2

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C214.1	2	2	1	1	1	2	2	-	2	2	1	2	2	2
C214.2	2	2	1	1	1	2	2	-	2	2	1	2	2	2
C214.3	2	2	1	1	-	2	2	-	2	2	1	2	2	2
C214.4	2	2	1	1	1	2	2	-	2	2	1	2	2	2
C214.5	2	2	1	1	1	2	2	1	2	2	1	2	2	2
C214.6	2	2	1	1	1	2	2	1	2	2	1	2	2	2
C214	2	2	1	1	1	2	2	1	2	2	1	2	2	2



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

Principal

Indra Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikandam, Trichy-620 012.

C215: ME3391-ENGINEERING THERMODYNAMICS

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C215.1	Apply the zeroth and first law of thermodynamics by formulating temperature scales and calculating the property changes in closed and open engineering systems	1,2,3,4,8,9,10,11,12	2,1
C215.2	Apply the second law of thermodynamics in analyzing the performance of thermal devices through energy and entropy calculations	1,2,3,4,8,10,11,12	2,1
C215.3	Apply the second law of thermodynamics in evaluating the various properties of steam through steam tables.	1,2,3,4,8,9,10,11,12	2,1
C215.4	Apply the properties of pure substance in computing the macroscopic properties of ideal and real gases using gas laws and appropriate thermodynamic relations	1,2,3,4,6,8,9,10,11,12	2,1
C215.5	Apply the properties of gas mixtures in calculating the properties of gas mixtures and applying various thermodynamic relations to calculate property changes	1,2,3,4,6,8,9,10,11,12	2,1
C215.6	Discuss the various properties of steam through Mollier chart.	1,2,3,4,6,8,10,11,12	2,1

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C215.1	3	3	2	1	-	-	-	1	-	2	1	2	3	1
C215.2	3	3	2	1	-	-	-	1	-	2	1	2	3	1
C215.3	3	3	2	1	-	-	-	1	2	2	1	2	3	1
C215.4	3	3	2	1	-	1	-	1	2	2	1	2	3	1
C215.5	3	3	2	1	-	1	-	1	2	2	1	2	3	1
C215.6	3	3	2	1	-	-	-	1	-	2	1	2	3	1
C215	3	3	2	1	-	1	-	1	2	2	1	2	3	1



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

C216:GE3451- ENVIRONMENTAL SCIENCES AND SUSTAINABILITY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C216.1	Explain the functions of environment, ecosystems and biodiversity and their conservation	1,2,3,4,6,7,10,11,12	1,1
C216.2	Identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society	1,2,3,4,6,7,10,11,12	1,1
C216.3	Identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations	1,2,3,4,6,7,10,11,12	1,1
C216.4	Discuss the different goals of sustainable development and apply them for suitable technological advancement and societal development	1,2,3,4,6,7,10,11,12	1,1
C216.5	Demonstrate sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization	1,2,3,4,6,7,10,11,12	1,1
C216.6	Recognize and analyze climate changes, concept of carbon credit and the challenges of environmental management.	1,2,3,4,6,7,10,11,12	1,1

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C216.1	3	2	1	1	-	2	2	-	-	2	1	2	1	1
C216.2	3	2	1	1	-	2	2	-	-	2	1	2	1	1
C216.3	3	2	1	1	-	2	2	-	-	2	1	2	1	1
C216.4	3	2	1	1	-	2	2	-	-	2	1	2	1	1
C216.5	3	2	1	1	-	2	2	-	-	2	1	2	1	1
C216.6	3	2	1	1	-	2	2	-	-	2	1	2	1	1
C216	3	2	1	1	-	2	2	-	-	2	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.

C217:AI3411-TRACTOR AND FARM ENGINES LABORATORY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C217.1	Demonstrate the working of tractors, power tillers and their functions	1,2,3,4,5,6,10,11,12	3,3
C217.2	Identify and rectify problems in the functioning of tractors and power tillers	1,2,3,4,5,6,10,11,12	3,3
C217.3	Summarize the ergonomics of tractors and power tillers.	1,2,3,4,5,6,10,11,12	3,3
C217.4	Explain the method of working of diesel engine with the help of working models	1,2,3,4,5,6,10,11,12	3,3
C217.5	Discuss about the dismantling and assembly of diesel engine	1,2,3,4,5,6,10,11,12	3,3
C217.6	Discuss about the dismantling and assembly of petrol engine	1,2,3,4,5,6,10,11,12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C217.1	3	2	2	1	3	1	-	-	-	1	2	1	3	3
C217.2	3	2	2	1	3	1	-	-	-	1	2	1	3	3
C217.3	3	2	2	1	3	1	-	-	-	1	2	1	3	3
C217.4	3	2	2	1	3	1	-	-	-	1	2	1	3	3
C217.5	3	2	2	1	3	1	-	-	-	1	2	1	3	3
C217.6	3	2	2	1	3	1	-	-	-	1	2	1	3	3
C217	3	2	2	1	3	1	-	-	-	1	2	1	3	3



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

C218: AI3412 STRENGTH OF MATERIALS LABORATORY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C218.1	Examine the stress distribution and strains in regular and composite structures subjected to axial loads	1,2,3,4,6,8,9,10,11,12	3,3
C218.2	Analyse the shear force, bending moment and bending stresses in beams	1,2,3,4,6,8,9,10,11,12	3,3
C218.3	Apply torsion equation in design of circular shafts and helical springs	1,2,3,4,6,8,9,10,11,12	3,3
C218.4	Discuss about Hardness test on metals	1,2,3,4,6,8,9,10,11,12	3,3
C218.5	Explain about Deflection test on metal beam	1,2,3,4,6,8,9,10,11,12	3,3
C218.6	Illustrate the Compression test on helical spring	1,2,3,4,6,8,9,10,11,12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C218.1	3	2	2	1	-	1	-	1	1	1	2	1	3	1
C218.2	3	2	2	1	-	1	-	1	1	1	2	1	3	1
C218.3	3	2	2	1	-	1	-	1	1	1	2	1	3	1
C218.4	3	2	2	1	-	1	-	1	1	1	2	1	3	1
C218.5	3	2	2	1	-	1	-	1	1	1	2	1	3	1
C218.6	3	2	2	1	-	1	-	1	1	1	2	1	3	1
C218	3	2	2	1	-	1	-	1	1	1	2	1	3	1



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

SEMESTER-5

C301:AI3501-FARM EQUIPMENT AND MACHINERY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C301.1	Examine the basics of mechanizing a farm.	1,2,3,4,5,10,11,12	3,1
C301.2	Discuss the components of various tillage equipment.	1,2,3,4,5,10,11,12	3,1
C301.3	Explain about different sowing and fertilizing attachments and stand-alone units	1,2,3,4,5,10,11,12	3,1
C301.4	Elaborate about weeder attachments and sprayers	1,2,3,4,5,10,11,12	3,1
C301.5	Illustrate about combine harvester	1,2,3,4,5,10,11,12	3,1
C301.6	Discuss the farm mechanization benefits and constraints, identification of components of primary and secondary tillage implements.	1,2,3,4,5,10,11,12	3,1

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C301.1	3	3	3	2	3	-	-	-	-	2	1	2	3	1
C301.2	3	3	3	2	3	-	-	-	-	2	1	2	3	1
C301.3	3	3	3	2	3	-	-	-	-	2	1	2	3	1
C301.4	3	3	3	2	3	-	-	-	-	2	1	2	3	1
C301.5	3	3	3	2	3	-	-	-	-	2	1	2	3	1
C301.6	3	3	3	2	3	-	-	-	-	2	1	2	3	1
C301	3	3	3	2	3	-	-	-	-	2	1	2	3	1

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

Principal

Indira Ganesan College of Engineering

IG Valley, Madurai Main Road

Manikandam, Trichy-620-012.

C302:AI3002 FOOD AND DAIRY ENGINEERING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C302.1	Explain physio-chemical properties of food material and select suitable thermal processing method for food products based on their properties	1,2,3,4,6,10,11,12	2,2
C302.2	Compare food drying systems and assess their limitations in applying different food products	1,2,3,4,6,7,10,11,12	2,2
C302.3	Explain physical, chemical and thermal properties of milk and compare milk processing techniques	1,2,3,4,6,7,10,11,12	2,2
C302.4	Apply various milk processing equipment for processing and producing milk products and evaluate their performance	1,2,3,4,6,7,10,11,12	2,2
C302.5	Discuss the application and limitations of advanced food processing techniques	1,2,3,4,6,7,10,11,12	2,2
C302.6	Illustrate the methods, and equipment for the various unit operations of dairy industry.	1,2,3,4,6,7,10,11,12	2,2

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C302.1	2	1	1	1	2	1	-	-	-	1	1	1	2	2
C302.2	2	1	1	1	2	1	1	-	-	1	1	1	2	2
C302.3	2	1	1	1	2	1	1	-	-	1	1	1	2	2
C302.4	2	1	1	1	2	1	1	-	-	1	1	1	2	2
C302.5	2	1	1	1	2	1	1	-	-	1	1	1	2	2
C302.6	2	1	1	1	2	1	1	-	-	1	1	1	2	2
C302	2	1	1	1	2	1	1	-	-	1	1	1	2	2



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

C303: AI3010 WASTE AND BY PRODUCT UTILIZATION

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C303.1	Discuss the types of waste and influences.	1-12	2,2
C303.2	Elaborate waste water management from any food industry.	1-12	2,2
C303.3	Explain byproduct utilization from processing plants of cereals, pulses	1-12	2,2
C303.4	Demonstrate hands on training in wastewater treatment process	1-12	2,2
C303.5	Explain advance procession techniques for waste water treatment	1-12	2,2
C303.6	Illustrate different byproducts of food industry and waste water management of any industry.	1-12	2,2

Mapping of COs- POs with PSOs

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



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

C304: AI3013 WATERSHED PLANNING AND MANAGEMENT

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C304.1	Analyse the degradation of soil and water resources and implementation of the measures for soil and water conservation.	1-12	2,2
C304.2	Describe the components involved in watershed planning	1-12	2,2
C304.3	Discuss the methods of water harvesting structures	1-12	2,2
C304.4	Design and construct the soil conservation structures	1-12	2,2
C304.5	Summarize and execute the watershed development programme	1-12	2,2
C304.6	Provide a comprehensive treatise on the engineering practices of watershed management for realizing the higher benefits of watershed management	1-12	2,2

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C304.1	3	2	2	2	3	3	3	2	2	1	3	2	2	2
C304.2	3	2	2	2	3	3	3	2	2	1	3	2	2	2
C304.3	3	2	2	2	3	3	3	2	2	1	3	2	2	2
C304.4	3	2	2	2	3	3	3	2	2	1	3	2	2	2
C304.5	3	2	2	2	3	3	3	2	2	1	3	2	2	2
C304.6	3	2	2	2	3	3	3	2	2	1	3	2	2	2
C304	3	2	2	2	3	3	3	2	2	1	3	2	2	2



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

C305: AI3019 SUSTAINABLE AGRICULTURE AND FOOD SECURITY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C305.1	Explain methods to sustain land resources.	1-12	2,2
C305.2	Cognize approaches to sustain water resources and its utilization for agriculture and allied activities.	1-12	2,2
C305.3	Design and develop new, improved and sustainable systems of agriculture and allied activities.	1-12	2,2
C305.4	Discuss new technologies for improving food security.	1-12	2,2
C305.5	Comprehend policies to achieve sustainable farming and food security.	1-12	2,2
C305.6	Illustrate the importance of sustainable agriculture for the growing population, various resources required and their sustainability.	1-12	2,2

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C305.1	3	2	2	2	3	1	3	3	3	3	3	2	2	2
C305.2	3	2	2	2	3	1	3	3	3	3	3	2	2	2
C305.3	3	2	2	2	3	1	3	3	3	3	3	2	2	2
C305.4	3	2	2	2	3	1	3	3	3	3	3	2	2	2
C305.5	3	2	2	2	3	1	3	3	3	3	3	2	2	2
C305.6	3	2	2	2	3	1	3	3	3	3	3	2	2	2
C305	3	2	2	2	3	1	3	3	3	3	3	2	2	2



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

C307: AI3511 FARM MACHINERY LABORATORY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C307.1	Identify major systems in a tractor and general guidelines on preliminary check measures before starting a tractor.	1,2,3,4,5,6,10,11,12	3,3
C307.2	Discuss the field operations and management of tillage implements.	1,2,3,4,5,6,10,11,12	3,3
C307.3	Explain the field operations and management of seeder devices and plant protection equipment.	1,2,3,4,5,6,10,11,12	3,3
C307.4	Examine the field operations and management of harvesters, threshers and combines.	1,2,3,4,5,6,8,10,11,12	3,3
C307.5	Discuss the field operations and management of heavy earth moving machinery.	1,2,3,4,5,6,8,10,11,12	3,3
C307.6	Explain the methods of repair, maintenance and off-season storage of farm equipment	1,2,3,4,5,6,8,10,11,12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C307.1	3	3	3	2	3	1	-	-	-	3	3	2	3	3
C307.2	3	3	3	2	3	1	-	-	-	3	3	2	3	3
C307.3	3	3	3	2	3	1	-	-	-	3	3	2	3	3
C307.4	3	3	3	2	3	1	-	2	-	3	3	2	3	3
C307.5	3	3	3	2	3	1	-	2	-	3	3	2	3	3
C307.6	3	3	3	2	3	1	-	2	-	3	3	2	3	3
C307	3	3	3	2	3	1	-	2	-	3	3	2	3	3



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

C308: AI3512 ICT IN AGRICULTURAL ENGINEERING LABORATORY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C308.1	Discuss on meteorological measurements	1,2,3,4,5,6,7,10,11,12	3,3
C308.2	Demonstrate on triggering an agricultural system	1,2,3,4,5,6,10,11,12	3,3
C308.3	Explain the Image processing as tool for biotic and abiotic stress identification	1,2,3,4,5,6,10,11,12	3,3
C308.4	Examine to conduct Spatial analysis of rainfall data and design water storage reservoirs	1,2,3,4,5,6,7,10,11,12	3,3
C308.5	Elaborate the Printed Circuit Board (PCB) or Breadboard for controlling or triggering an agricultural system	1,2,3,4,5,6,7,10,11,12	3,3
C308.6	Explain about mobile apps for controlling or triggering an agricultural system	1,2,3,4,5,6,10,11,12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C308.1	2	2	2	2	1	1	1	-	-	1	2	2	3	3
C308.2	2	2	2	2	1	1	-	-	-	1	2	2	3	3
C308.3	2	2	2	2	1	1	-	-	-	1	2	2	3	3
C308.4	2	2	2	2	1	1	1	-	-	1	2	2	3	3
C308.5	2	2	2	2	1	1	1	-	-	1	2	2	3	3
C308.6	2	2	2	2	1	1	-	-	-	1	2	2	3	3
C308	2	2	2	2	1	1	1	-	-	1	2	2	3	3



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

SEMESTER-VI

C309: AI3601-POST- HARVEST TECHNOLOGY

CO	Course Outcomes	POs	PSOs
C309.1	Explain the importance of post-harvest processing and determine moisture content of products	1,2,3,4,5,6,10,11,12	3,3
C309.2	Perform drying of agricultural products and analyze performance of dryers	1,2,3,4,5,6,10,11,12	3,3
C309.3	Recognize the working principles of grain cleaning and grading devices and able to select suitable equipment for cereal grains, oilseeds, and pulses	1,2,3,4,5,6,10,11,12	3,3
C309.4	Analyse the operation of post harvest equipment like shellers, conveyors	1,2,3,4,5,6,10,11,12	3,3
C309.5	Different Post Harvest operations and processing methods of harvested crops.	1,2,3,4,5,6,10,11,12	3,3
C309.6	Discuss the Paddy processing and parboiling of paddy and its method .	1,2,3,4,5,6,10,11,12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C309.1	3	3	2	1	1	1	-	-	-	1	1	1	3	3
C309.2	3	3	2	1	1	1	-	-	-	1	1	1	3	3
C309.3	3	3	2	1	1	1	-	-	-	1	1	1	3	3
C309.4	3	3	2	1	1	1	-	-	-	1	1	1	3	3
C309.5	3	3	2	1	1	1	-	-	-	1	1	1	3	3
C309.6	3	3	2	1	1	1	-	-	-	1	1	1	3	3
C309	3	3	2	1	1	1	-	-	-	1	1	1	3	3



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

C310:AI3602-IRRIGATION AND DRAINAGE ENGINEERING

CO	Course Outcomes	POs	PSOs
C310.1	Explain on Planning, design, operation and management of Water Resources and Irrigation Requirement.	1,2,3,4,5,6,7,8,10,11,12	3,3
C310.2	Discuss on different methods of irrigation including canal irrigation	1,2,3,4,5,6,7,8,10,11,12	3,3
C310.3	Illustrate on different types Diversion and Impounding Structures	1,2,3,4,5,6,7,8,10,11,12	3,3
C310.4	Differentiate the concept Canal Irrigation and Command Area Development	1,2,3,4,5,6,7,8,10,11,12	3,3
C310.5	Illustrate the concept recycling of drainage water for irrigation.	1,2,3,4,5,6,7,8,10,11,12	3,3
C310.6	Inculcate water resources development and various parameters required for irrigation scheduling and its requirement .	1,2,3,4,5,6,7,8,10,11,12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C310.1	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C310.2	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C310.3	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C310.4	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C310.5	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C310.6	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C310	2	2	2	1	2	1	2	1	-	2	2	2	2	2



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

C311: AI3003 PROCESS ENGINEERING OF FRUITS AND VEGETABLES

CO	Course Outcomes	POs	PSOs
C311.1	Implement low temperature, modified atmosphere and controlled atmospheric storage methods for storage of fruits and vegetables	1-12	2,2
C311.2	Produce value added products from fruits and vegetables by using suitable preservation method (sugar, salt or dehydration)	1-12	2,2
C311.3	Produce dehydrated fruits and vegetables	1-12	2,2
C311.4	Apply minimal processing and fermentation methods to produce value added products from fruits and vegetables	1-12	2,2
C311.5	Plan to produce canned and bottled fruits and vegetables	1-12	2,2
C311.6	Examine the industrial scale processing and preservation methods to extend the shelf life of fruit and vegetable commodities	1-12	2,2

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C311.1	2	1	1	1	2	1	1	1	1	1	2	2	2	2
C311.2	2	1	1	1	2	1	1	1	1	1	2	2	2	2
C311.3	2	1	1	1	2	1	1	1	1	1	2	2	2	2
C311.4	2	1	1	1	2	1	1	1	1	1	2	2	2	2
C311.5	2	1	1	1	2	1	1	1	1	1	2	2	2	2
C311.6	2	1	1	1	2	1	1	1	1	1	2	2	2	2
C311	2	1	1	1	2	1	1	1	1	1	2	2	2	2



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

C312: CAI335 SOLAR AND WIND ENERGY SYSTEM

CO	Course Outcomes	POs	PSOs
C312.1	Explain the basics of solar energy and solar thermal energy conversion technologies and compare direct mode and indirect mode solar dryers.	1-12	2,2
C312.2	Analyse the principles and applications of solar thermal power stations, solar pond, and solar stills	1-12	2,2
C312.3	Discuss the wind power laws and calculate the torque and power characteristics of wind energy	1-12	2,2
C312.4	Design wind mills and test the units for certification	1-12	2,2
C312.5	Elaborate the principles of geothermal energy, wave energy, tidal energy, OTEC energy, fuel cells and analyse their applications	1-12	2,2
C312.6	Analyse the alternate sources of energy such as geothermal energy, wave energy, tidal energy, OTEC energy, fuel cells and energy storage.	1-12	2,2

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C312.1	3	3	2	1	3	3	3	2	2	1	3	3	2	2
C312.2	3	3	2	1	3	3	3	2	2	1	3	3	2	2
C312.3	3	3	2	1	3	3	3	2	2	1	3	3	2	2
C312.4	3	3	2	1	3	3	3	2	2	1	3	3	2	2
C312.5	3	3	2	1	3	3	3	2	2	1	3	3	2	2
C312.6	3	3	2	1	3	3	3	2	2	1	3	3	2	2
C312	3	3	2	1	3	3	3	2	2	1	3	3	2	2




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

C313: AI3015 PROTECTED CULTIVATION

CO	Course Outcomes	POs	PSOs
C313.1	Describe the different methods of protected cultivation practices available for vegetable crops and flowers	1,2,3,4,5,6,7,8,10,11,12	3,3
C313.2	Discuss the technology available for vegetable crops	1,2,3,4,5,6,7,8,10,11,12	3,3
C313.3	Explain the technology available for flower crops	1,2,3,4,5,6,7,8,10,11,12	3,3
C313.4	Elaborate precision farming techniques using sensors and Geographic information systems for the crops	1,2,3,4,5,6,7,8,10,11,12	3,3
C313.5	Illustrate the technology available for horticulture crops	1,2,3,4,5,6,7,8,10,11,12	3,3
C313.6	Differentiate the various production practices of flower and other high value crops.	1,2,3,4,5,6,7,8,10,11,12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C313.1	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C313.2	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C313.3	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C313.4	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C313.5	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C313.6	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C313	2	2	2	1	2	1	2	1	-	2	2	2	2	2


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

C314: OCS352 IOT CONCEPTS AND APPLICATIONS

CO	Course Outcomes	POs	PSOs
C314.1	Explain the concept of IoT.	1,2,3,4,5,6,7,8,10,11,12	3,3
C314.2	Discuss the communication models and various protocols for IoT	1,2,3,4,5,6,7,8,10,11,12	3,3
C314.3	Design portable IoT using Arduino/Raspberry Pi /open platform	1,2,3,4,5,6,7,8,10,11,12	3,3
C314.4	Apply data analytics and use cloud offerings related to IoT	1,2,3,4,5,6,7,8,10,11,12	3,3
C314.5	Analyze applications of IoT in real time scenario.	1,2,3,4,5,6,7,8,10,11,12	3,3
C314.6	Explain how to code for an IoT application using Arduino/Raspberry Pi open platform.	1,2,3,4,5,6,7,8,10,11,12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C314.1	3	2	2	1	3	-	-	-	1	2	2	2	2	2
C314.2	3	2	2	1	3	-	-	-	1	2	2	2	2	2
C314.3	3	2	2	1	3	-	-	-	1	2	2	2	2	2
C314.4	3	2	2	1	3	-	-	-	1	2	2	2	2	2
C314.5	3	2	2	1	3	-	-	-	1	2	2	2	2	2
C314.6	3	2	2	1	3	-	-	-	1	2	2	2	2	2
C314	3	2	2	1	3	-	-	-	1	2	2	2	2	2



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

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

C315: MX3089 INDUSTRIAL SAFETY

CO	Course Outcomes	POs	PSOs
C315.1	Discuss the basic concept of safety.	1,2,3,4,5,6,7,8,10,11,12	3,3
C315.2	Analyze Statutory Regulations and standards.	1,2,3,4,5,6,7,8,10,11,12	3,3
C315.3	Analyze about the safety Activities of the Working Place.	1,2,3,4,5,6,7,8,10,11,12	3,3
C315.4	Explain on the impact of Occupational Exposures and their Remedies	1,2,3,4,5,6,7,8,10,11,12	3,3
C315.5	Illustrate the Risk Assessment Techniques.	1,2,3,4,5,6,7,8,10,11,12	3,3
C315.6	Analyze the various Hazards and consequences through various Risk Assessment Techniques.	1,2,3,4,5,6,7,8,10,11,12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C315.1	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C315.2	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C315.3	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C315.4	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C315.5	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C315.6	2	2	2	1	2	1	2	1	-	2	2	2	2	2
C315	2	2	2	1	2	1	2	1	-	2	2	2	2	2



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

C316:AI3611-CAD FOR AGRICULTURE MACHINERY LABORATORY

CO	Course Outcomes	POs	PSOs
C316.1	Design and Drawing of Underground pipeline system	1,2,3,4,5,6,7,8,10,11,12	3,3
C316.2	Design and Drawing of Check dam	1,2,3,4,5,6,7,8,10,11,12	3,3
C316.3	Design and Drawing of Mould board plough	1,2,3,4,5,6,7,8,10,11,12	3,3
C316.4	Design and Drawing of Disk plough	1,2,3,4,5,6,7,8,10,11,12	3,3
C316.5	Design and Drawing of Post harvest technology units (threshers and winnowers)	1,2,3,4,5,6,7,8,10,11,12	3,3
C316.6	Design and draw the components using computer aided methods.	1,2,3,4,5,6,7,8,10,11,12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C316.1	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C316.2	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C316.3	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C316.4	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C316.5	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C316.6	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C316	2	2	2	1	3	1	-	-	1	1	2	2	2	2



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

C317: AI3612 POST – HARVEST TECHNOLOGY LABORATORY

CO	Course Outcomes	POs	PSOs
C317.1	Determine of moisture content of grains by oven method and moisture meter.	1,2,3,4,5,6,7,8,10,11,12	3,3
C317.2	Determine of porosity of grains.	1,2,3,4,5,6,7,8,10,11,12	3,3
C317.3	Determine of coefficient of friction and angle of repose of grains.	1,2,3,4,5,6,7,8,10,11,12	3,3
C317.4	Evaluate of shelling efficiency of rubber roll sheller	1,2,3,4,5,6,7,8,10,11,12	3,3
C317.5	Evaluate of thin layer drier	1,2,3,4,5,6,7,8,10,11,12	3,3
C317.6	Determine the different engineering properties of biological materials and their importance	1,2,3,4,5,6,7,8,10,11,12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C317.1	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C317.2	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C317.3	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C317.4	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C317.5	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C317.6	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C317	2	2	2	1	3	1	-	-	1	1	2	2	2	2


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

C318: AI3613 IRRIGATION FIELD LABORATORY

CO	Course Outcomes	POs	PSOs
C318.1	Explain on various meteorological instruments and understanding the concept of different irrigational systems in the laboratory tests.	1,2,3,4,5,6,7,8,10,11,12	3,3
C318.2	Measure of flow properties in open irrigated channels	1,2,3,4,5,6,7,8,10,11,12	3,3
C318.3	Discuss on Drip irrigation system with all accessories	1,2,3,4,5,6,7,8,10,11,12	3,3
C318.4	Explain on Sprinkler irrigation system with all accessories	1,2,3,4,5,6,7,8,10,11,12	3,3
C318.5	Determine of infiltration rate using double ring and digital infiltrometer	1,2,3,4,5,6,7,8,10,11,12	3,3
C318.6	Determine of soil moisture wetting pattern for irrigation scheduling	1,2,3,4,5,6,7,8,10,11,12	3,3

Mapping of COs- POs with PSOs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C318.1	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C318.2	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C318.3	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C318.4	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C318.5	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C318.6	2	2	2	1	3	1	-	-	1	1	2	2	2	2
C318	2	2	2	1	3	1	-	-	1	1	2	2	2	2



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