



# **ESWAR COLLEGE OF ENGINEERING**

**(Approved by AICTE, & Affiliated to JNTUK, A.P.)**

**KESANUPALLI (V), NARASARAOPETA-522549, AP**

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**2.6.1 – Programme Outcomes and Course Outcomes for all Programmes offered by the institution are stated and displayed on the website and communicated to teachers and students**



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The Outcome based Education is followed in the teaching learning process. The objectives of the Outcome Based Education (OBE) emphasizes on outcomes like, Program Outcomes (POs), Program Specific Outcomes (PSOs) and Course Outcomes (COs). The Outcomes are derived by involving all the relevant stakeholders at the department level offering the concerned program. After a consensus is arrived at, the objectives are publicized through

- Curriculum /regulations books
- Class rooms
- Department Notice Boards
- Laboratories
- Student Induction Programs
- Meetings/ Interactions with employers
- Parent meet
- Faculty meetings
- Alumni meetings
- Library

While addressing the students at the Induction Program the HODs create awareness on POs, PSOs. During the course of study, the concerned faculty throws light on the outcome of the course (COs).

Program specific outcomes (PSOs) are derived based on the specific skill sets of faculty who are available as strength to the department and associated industrial conclave if any. At the end of the program, the students are also assessed to analyse the requirements and accomplishments to be fulfilled at the micro level.

Program Outcomes (POs) are statements with a wider scope that describe the professional accomplishments that the program aims at. POs incorporate many areas of inter-related knowledge, skills and personality traits that are to be acquired by the students during their graduation, and the students need to accomplish these by the time they complete the program.

Course outcomes (COs) describe the essential and enduring disciplinary knowledge, abilities that students should possess and the subject knowledge that should be required upon completion of a course. They are clearly specified and communicated. The faculty who teaches that particular course prepares the Course Outcomes. After this, they are discussed in the concerned department's BOS meeting course-wise and finally approved.



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## Course Outcomes

A.Y:2023-2024

Year/Sem: II B.Tech I SEM

<b>Course Name: Mathematics –III( Vector Calculus, Transforms and PDE)</b>	
<b>Course Code: AGR2101</b>	
<b>AGR2101.1</b>	Determine the physical meaning of different operators such as gradient, curl and divergence
<b>AGR2101.2</b>	Estimate the work done against a field, circulation and flux using vector calculus
<b>AGR2101.3</b>	Apply the Laplace transform for solving differential equations
<b>AGR2101.4</b>	Compute the Fourier series of periodic signals
<b>AGR2101.5</b>	know and be able to apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic waveforms
<b>AGR2101.6</b>	Identify solution methods for partial differential equations that model physical processes

<b>Course Name: Surveying and levelling</b>	
<b>Course Code: AGR2102</b>	
<b>AGR2102.1</b>	Understand the overview of plane surveying
<b>AGR2102.2</b>	Able to know the various methods in surveying and types
<b>AGR2102.3</b>	Classify the levelling methods
<b>AGR2102.4</b>	Differentiate the inaccessible points in the plane table surveying
<b>AGR2102.5</b>	Define the tachometric surveying and points in the plane
<b>AGR2102.6</b>	Analyse the distance and elevation points in the surveying

<b>Course Name: Fluid Mechanics and Open Channel Hydraulics</b>	
<b>Course Code: AGR2103</b>	
<b>AGR2103.1</b>	Understand the various properties of fluids and their influence on fluid motion and analyse a variety of problems in fluid statics and dynamics
<b>AGR2103.2</b>	Calculate the forces that act on submerged planes and curves
<b>AGR2103.3</b>	Ability to analyse various types of fluid flows
<b>AGR2103.4</b>	Apply the integral forms of the three fundamental laws of fluid mechanics to turbulent and laminar flow through pipes and ducts
<b>AGR2103.5</b>	Determination of order to predict relevant pressures, velocities and forces
<b>AGR2103.6</b>	Able Measure the quantities of fluid flowing in pipes, tanks and channels

<b>Course Name: Properties of Strength of materials</b>	
<b>Course Code: AGR2104</b>	
<b>AGR2104.1</b>	Understand the basic materials behaviour under the influence of different external loading conditions and the support conditions



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AGR2104.2	Able to draw the diagrams indicating the variation of the key performance features like bending moment and shear forces
AGR2104.3	Knowledge of bending concepts and calculation of section modulus
AGR2104.4	Determination of stresses developed in the beams and deflections due to various loading conditions
AGR2104.5	To classify cylinders based on their thickness and to derive equations for measurement of stresses across the cross section when subjected to external pressure
AGR2104.6	Analysis stresses across section of the thin and thick cylinders to arrive at optimum sections to withstand the internal pressure using Lamé's equation

<b>Course Name: Farm Power and Tractor System</b>	
<b>Course Code: AGR2105</b>	
AGR2105.1	Able to development on farm power sources classification I.C engine components & construction, operating systems
AGR2105.2	Understand the classification of fuels and lubricants in farm methods
AGR2105.3	Define the heir properties, governing systems of IC engines, power transmission, clutches & its applications
AGR2105.4	Differentiate the principles of fluid coupling & torque connector, brakes principles
AGR2105.5	Applying Tractor testing and its main components, CG estimation, Tractor chassis its mechanics
AGR2105.6	Classify the friction concepts of hydraulic system in factors.

<b>Course Name: Surveying and Levelling Lab</b>	
<b>Course Code: AGR2106</b>	
AGR2106.1	To understand the various types of surveying methods
AGR2106.2	Determination of the areas by applying the chain surveying
AGR2106.3	Analyse the area calculations by triangulations methods
AGR2106.4	Finding the area boundaries by plane table survey
AGR2106.5	Determination of distance between two inaccessible points by using compass
AGR2106.6	To understand the Height of the instrument method

<b>Course Name: Fluid Mechanics and Open Channel Hydraulics Lab</b>	
<b>Course Code: AGR2107</b>	
AGR2107.1	Understand the practical skills on determination of metacentric height and Bernoulli's theorem
AGR2107.2	Analyse the measurement of discharge with venturimeter and pilot tubes
AGR2107.3	Determining discharge coefficient of rectangular, triangular and trapezoidal weir and orifices
AGR2107.4	Imposing practical skills on determination of head losses in pipes, roughness coefficient of open channels
AGR2107.5	Able to know the velocity and pressure in open channels, construction of flownet problems on flownets



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AGR2107.6	Determination of head losses in pipes
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<b>Course Name: Field Operation and Maintenance of Tractors Lab</b>	
<b>Course Code: AGR2108</b>	
AGR2108.1	Able to know skills on air kind fuel filtration systems, lubrication system and Their maintenance in tractors
AGR2108.2	Analyse maintenance of transmission and radiators cooling systems in tractor
AGR2108.3	Practical skills development on maintenance of tractor ignition and hydraulic systems
AGR2108.4	knowledge on periodical maintenance of tractors, emission of smoke, clutch and brake system maintenance
AGR2108.5	Define precautions in handling diesel fuels in diesel engine
AGR2108.6	Understand the causes of ignition failure in battery system

<b>Course Name: Agricultural Machinery Design using CAD/CAM</b>	
<b>Course Code: AGR2109</b>	
AGR2109.1	Application of computers for designing and Overview of CAD window – explanation of various options on drawing screen
AGR2109.2	Understand dimension and dimensional editing tool bar and Practice on dimension toolbar
AGR2109.3	Study on layer command and modifying drafting
AGR2109.4	Practice on 3-D commands- Extrusion and loft commands
AGR2109.5	Define 2 D- orthographic projections using draw tool bar
AGR2109.6	Demonstration on CNC machine and simple problems

## Year/Sem: II B.Tech II SEM

<b>Course Name: Heat and Mass Transfer</b>	
<b>Course Code: AGR2201</b>	
AGR2201.1	Understand the principles of heat and mass transfer, steady state heat transfer & its analysis
AGR2201.2	Able to know the measurement of thermal conducting of pleasure & composite walls, tubes and spheres, multilayer tubes
AGR2201.3	Classify the conduction principles of different materials in parallel
AGR2201.4	Differentiate combined convection and conduction, concept of insulation
AGR2201.5	Analyse the conduction, convection and radiation analysis of heat and mass transfer, different laws on radiation theory
AGR2201.6	Define principles of heat exchanges, their analysis, frick's law of mass transfer coefficients, Reynolds analogy



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<b>Course Name: Ground Water Hydrology ,Wells and Pumps</b>	
<b>Course Code: AGR2202</b>	
<b>AGR2202.1</b>	Able to know principles of ground water resources development, different acquaintance and their principles
<b>AGR2202.2</b>	Define the types of aquifers and their properties
<b>AGR2202.3</b>	Understand knowledge on theory of open well hydraulics and drilling methods
<b>AGR2202.4</b>	Imparting the artificial ground water recharge classification of indigenous pumps, solar pumps, wind mill pumps
<b>AGR2202.5</b>	Differentiate the types pumps and their properties
<b>AGR2202.6</b>	Apply High lift pumps, mixed flow pumps and vertical turbine pump sets

<b>Course Name: Theory of Structures</b>	
<b>Course Code: AGR2203</b>	
<b>AGR2203.1</b>	Able to understand the various design methods in RCC
<b>AGR2203.2</b>	Differentiate the over and under reinforced structures with loading
<b>AGR2203.3</b>	Analysis and design of flexural members and detailing
<b>AGR2203.4</b>	Classification of various types slabs in RCC
<b>AGR2203.5</b>	Design different type of compression members and footings
<b>AGR2203.6</b>	Understand different types of footings and design

<b>Course Name: Soil mechanics</b>	
<b>Course Code: AGR2204</b>	
<b>AGR2204.1</b>	Define principles of soil mechanics soil classification, stresses in soils
<b>AGR2204.2</b>	Understand Boussinesq's analysis for vertical pressure applications
<b>AGR2204.3</b>	Apply the Westergaard's analysis for point load applications
<b>AGR2204.4</b>	knowledge on shear stress analysis, Mohr's stress circle, measurement of shear strength
<b>AGR2204.5</b>	Skill development on soil consolidations theory and principles
<b>AGR2204.6</b>	Classify the earth pressure and its effects on soil stability of slopes

<b>Course Name: Managerial Economics &amp; Financial Analysis</b>	
<b>Course Code: AGR2205</b>	
<b>AGR2205.1</b>	Able to know the knowledge of estimating the Demand and demand elasticity's for a product
<b>AGR2205.2</b>	The knowledge of understanding of the Input-Output-Cost relationships
<b>AGR2205.3</b>	Estimation of the least cost combination of inputs
<b>AGR2205.4</b>	Prepare Financial Statements and the usage of various Accounting tools for Analysis
<b>AGR2205.5</b>	evaluate various investment project proposals with the help of capital budgeting techniques for decision making
<b>AGR2205.6</b>	Understand the concept of Capital, Capital Budgeting and the techniques used to evaluate Capital Budgeting proposals



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<b>Course Name: Heat and Mass Transfer Lab</b>	
<b>Course Code: AGR2206</b>	
AGR2206.1	Understand the COP of VCR System with Capillary and thermal expansion valve
AGR2206.2	Determination of heat transfer rate through a lagged pipe
AGR2206.3	Able to know the heat transfer rate through a concentric sphere
AGR2206.4	Estimate the heat transfer coefficient in natural and forced convection
AGR2206.5	Define the effectiveness of parallel and counter flow heat exchangers
AGR2206.6	Apply the Thermal conductivity of liquids and gases on samples

<b>Course Name: Theory of Structures Lab</b>	
<b>Course Code: AGR2207</b>	
AGR2207.1	Understand the moment area theorem regarding the slope and deflection of the beam
AGR2207.2	Different types of columns and find Euler's buckling load for each case
AGR2207.3	Analyse two hinged arch for the horizontal displacement of the roller end for a given system of loading
AGR2207.4	Define the value of flexural rigidity (EI) for a given beam and compare it with theoretical value
AGR2207.5	Estimate the Muller Breslau theorem by using Begg's deformer set
AGR2207.6	Verify clerk Maxwell's reciprocal theorem

<b>Course Name: Soil Mechanics Lab</b>	
<b>Course Code: AGR2208</b>	
AGR2208.1	Able to Determination of water content of soil
AGR2208.2	Understand the field density of soil by core cutter method
AGR2208.3	Classify Grain size analysis by sieving (Dry sieve analysis)
AGR2208.4	Define the permeability by constant head method
AGR2208.5	Able to know the Determination of unconfined compressive strength of soil
AGR2208.6	Differentiate the consolidation properties of soils

<b>Course Name: Analysis/Simulation Using MAT Lab</b>	
<b>Course Code: AGR220</b>	
AGR2209.1	Understand the Development of soil monitoring systems
AGR2209.2	Analysis of harvesting equipment design parameters and performance
AGR2209.3	Define the safety storage of harvested crops
AGR2209.4	Able to know the Tractor position tracking using MAT Lab
AGR2209.5	Development of real-time monitoring system of agricultural fields
AGR2209.6	Monitoring the critical factor as water quality to enhance the growth of crops is develop using sensors



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Year/Sem: III B.Tech I SEM

<b>Course Name: Farm Machinery and Equipment - I</b>	
<b>Course Code: AGR3101</b>	
<b>AGR3101.1</b>	To understand primary and secondary tillage implements
<b>AGR3101.2</b>	Differentiate earth moving machinery, seeding and plant protection equipment
<b>AGR3101.3</b>	Able to know get awareness on the mechanical area of the agricultural engineering
<b>AGR3101.4</b>	Understand Classification and types of tillage, Primary tillage implements
<b>AGR3101.5</b>	Analyse Problems on forces analysis, Draft measurement of tillage equipment
<b>AGR3101.6</b>	Apply the Different types of seed metering mechanism, different types of furrow openers

<b>Course Name: Surface Water Hydrology</b>	
<b>Course Code: AGR3102</b>	
<b>AGR3102.1</b>	Able to know to acquire knowledge and skills on hydrological cycle
<b>AGR3102.2</b>	Understand to measurements in watersheds, hydrological design of structure
<b>AGR3102.3</b>	Differentiate the prediction of volume and rates of runoff with tools like hydrographs and unit hydrograph
<b>AGR3102.4</b>	Define the reservoir planning with flood routing techniques
<b>AGR3102.5</b>	Application in natural resources management in watershed
<b>AGR3102.6</b>	Analyse Arithmetic mean, Thiessen polygon, Isohyetal methods, DAD relationships and curves

<b>Course Name: Post Harvest engineering of Cereals, Pulses And Oilseeds</b>	
<b>Course Code: AGR3103</b>	
<b>AGR3103.1</b>	To acquire knowledge and skills on Cleaning and grading
<b>AGR3103.2</b>	Define aspiration, scalping; size separators, screens, sieve analysis, capacity
<b>AGR3103.3</b>	Able to know Different methods of drying, batch-continuous
<b>AGR3103.4</b>	Apply mixing-non-mixing, sun, mechanical, conduction, convection, radiation, superheated steam, tempering during drying
<b>AGR3103.5</b>	Define Milling of rice, Milling of wheat, unit operations and equipment
<b>AGR3103.6</b>	Apply the CFTRI and Pantnagar methods

<b>Course Name: Environmental Management</b>	
<b>Course Code: AGR3104</b>	
<b>AGR3104.1</b>	Understand the Plan and design the water and wastewater systems
<b>AGR3104.2</b>	Analyse the he source of emissions and select proper control systems
<b>AGR3104.3</b>	Able to know the Design & estimation of water supply system for a city
<b>AGR3104.4</b>	knowledge about various environmental aspects
<b>AGR3104.5</b>	Apply the suitable treatment flow for raw water treatments
<b>AGR3104.6</b>	Differentiate the importance of Water and Wastewater Treatment Plant and





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	supply system
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<b>Course Name: Green House Technology</b>	
<b>Course Code: AGR3105</b>	
<b>AGR3105.1</b>	Understand the Constructional and operational details of greenhouses
<b>AGR3105.2</b>	students to grow crops with profits
<b>AGR3105.3</b>	Able to know the greenhouses for offseason usage and also to manage them commercially
<b>AGR3105.4</b>	Classify Greenhouse types based on shape, utility, construction and covering material
<b>AGR3105.5</b>	Define Temperature requirement of horticultural crops, light requirement of crops and lighting control methods
<b>AGR3105.6</b>	Analyse Site selection and orientation, structural design

<b>Course Name: Theory of Machines Lab</b>	
<b>Course Code: AGR3106</b>	
<b>AGR3106.1</b>	Able to determine whirling speed of shaft theoretically and experimentally.
<b>AGR3106.2</b>	Understand position of sleeve against controlling force and speed of a Hartnell governor and to plot the characteristic curve of radius of rotation
<b>AGR3106.3</b>	Analyse the motion of a motorized gyroscope when the couple is applied along its spin axis
<b>AGR3106.4</b>	Study the static and dynamic balancing using rigid blocks
<b>AGR3106.5</b>	Plot slider displacement, velocity and acceleration against crank rotation for single slider crank mechanism/Four bar mechanism
<b>AGR3106.6</b>	Define simple and compound screw jack and determine the mechanical advantage, velocity ratio and efficiency

<b>Course Name: Electrical Circuits Lab</b>	
<b>Course Code: AGR3107</b>	
<b>AGR3107.1</b>	To verify and demonstrate various theorems and resonance
<b>AGR3107.2</b>	Able to draw the locus diagram of series circuits
<b>AGR3107.3</b>	Determine the various parameters of a two port networks
<b>AGR3107.4</b>	Define self and mutual inductance of a magnetic circuit, parameters of a given coil
<b>AGR3107.5</b>	Analyse to measure the power of three phase unbalanced circuit
<b>AGR3107.6</b>	Applying Kirchhoff's law to verify the circuit laws



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Year/Sem: III B.Tech II SEM

<b>Course Name: Soil and Water Conservation Engineering</b>	
<b>Course Code: AGR3201</b>	
<b>AGR3201.1</b>	Acquire knowledge on different soil laws estimation models, run off estimation by rational, curve number, cook's
<b>AGR3201.2</b>	Define Land use, capability classification, soil conservation measures like contour bunding, terracing, bench terraces
<b>AGR3201.3</b>	Classify the contour trenches and their types and complete design calculations
<b>AGR3201.4</b>	To enrich the students and familiarize the students in the design of various gully control structures
<b>AGR3201.5</b>	Able to know the estimation of Factors affecting runoff
<b>AGR3201.6</b>	Designs with a due importance to hydrologic, hydraulic and structural phases of design

<b>Course Name: Farm Machinery and Equipment - II</b>	
<b>Course Code: AGR3202</b>	
<b>AGR3202.1</b>	Understand the basic principles of cutting mechanisms and to know the various available harvesting machine
<b>AGR3202.2</b>	To know the working principle and functions of various machine parts of mowers, reapers
<b>AGR3202.3</b>	Define windrowers, forage harvesters, threshers, combine harvesters, cotton strippers, cotton pickers, groundnut and potato and sugarcane harvesters
<b>AGR3202.4</b>	Students can also understand the importance of testing and evaluation of agricultural machines
<b>AGR3202.5</b>	Different standard codes (BIS Codes) available in India for testing of machinery
<b>AGR3202.6</b>	Classify Crop harvesting machinery, history of development

<b>Course Name: Agricultural Process Engineering</b>	
<b>Course Code: AGR3203</b>	
<b>AGR3203.1</b>	Able to know the unit operations of agricultural process engineering
<b>AGR3203.2</b>	Classify the preliminary operations such as clearing, size reduction, mixing, separation, filtration and materials handling equipment
<b>AGR3203.3</b>	Define Principle, classification, operation, advantages, disadvantages
<b>AGR3203.4</b>	Analyse capacity and power requirement
<b>AGR3203.5</b>	Able to know the Scope and importance crop processing
<b>AGR3203.6</b>	Introduction, theory of solids mixing, criteria of mixer effectiveness and mixing index for granular solids



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<b>Course Name: Water Shed Management</b>	
<b>Course Code: AGR3204</b>	
<b>AGR3204.1</b>	Know the quality and quantity of water for various industries and Advanced water treatment methods
<b>AGR3204.2</b>	Learn the common methods of treatment of wastewaters and Biological treatment methods
<b>AGR3204.3</b>	Analyse methods to reduce impacts of disposal of wasters into environment and CETPs
<b>AGR3204.4</b>	Classify the treatment of wastewaters from specific industries like steel plants
<b>AGR3204.5</b>	Able to know methods of treatment of wastewaters from industries like Aqua, dairy, sugar plants, and distilleries that imply biological treatment methods
<b>AGR3204.6</b>	Applying the neutralization methods for water treatment

<b>Course Name: Remote Sensing &amp; GIS</b>	
<b>Course Code: AGR3205</b>	
<b>AGR3205.1</b>	Understand Model the geometry of real-world structure Represent the physical model of structural element/structure
<b>AGR3205.2</b>	Analyse the Perform analysis of the frame
<b>AGR3205.3</b>	Able to Design and detailing of built up steel beam
<b>AGR3205.4</b>	Developing a design programme for foundation
<b>AGR3205.5</b>	Differentiate the Interpret from the Post processing results
<b>AGR3205.6</b>	Analysis & Design of Roof Trusses

<b>Course Name: Soil and Water Conservation Engineering Lab</b>	
<b>Course Code: AGR3206</b>	
<b>AGR3206.1</b>	Estimate the soil losses and sediment concentration
<b>AGR3206.2</b>	Describes the procedure for planning and construction of soil conservation measures
<b>AGR3206.3</b>	Design the soil conversion measures and structures
<b>AGR3206.4</b>	Underrated the procedure for estimation of soil loss
<b>AGR3206.5</b>	Define discharge, evaporation, sediment, accumulation, water movement through layers
<b>AGR3206.6</b>	Able to know Measurement of irrigation water with H-Flume

<b>Course Name: Farm Machinery and Equipment Lab</b>	
<b>Course Code: AGR3207</b>	
<b>AGR3207.1</b>	student to get the practical knowledge on various operation in agricultural field for crop production
<b>AGR3207.2</b>	Study of various Farm Machinery and equipment
<b>AGR3207.3</b>	Determination of Field capacity and Field efficiency of primary tillage implements



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AGR3207.4	Study of different types of plough bottoms and shares of M.B. Plough
AGR3207.5	Define Calibration of seed drill and problems
AGR3207.6	Analyse Construction and working of renovators and weeding equipment

<b>Course Name: Agricultural Process Engineering Lab</b>	
<b>Course Code: AGR3208</b>	
AGR3208.1	Understand students on how to conduct experiments and evaluate performance of various agricultural food process
AGR3208.2	Able to know the Preparation of flow charts and layout of a food processing plant
AGR3208.3	Determination of the efficiency of cyclone separator
AGR3208.4	Tutorial on extraction by McCabe and Thiele plot
AGR3208.5	Define Performance evaluation of hammer mill and attribution mill
AGR3208.6	Apply Transport Processes and separation Process Principle

<b>Course Name: Structural Design with ANSYS Lab</b>	
<b>Course Code: AGR3209</b>	
AGR3209.1	Understand the concepts of Loads and use of BIS Codes
AGR3209.2	Able to design of singly and doubly reinforced sections, Reinforced concrete Cantilever
AGR3209.3	Design of Eccentric Shear and Moment Resisting connections
AGR3209.4	Applying Method of IS code and Structural steel Framing
AGR3209.5	Able to know Design of Flanged Beams, Slabs, Columns, Foundations, Retaining walls and Silos
AGR3209.6	Differentiate Design of Shear Key-Design and Drawing