LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (Autonomous)
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Affiliated to JNTUK, Kakinada & Approved by AICTE New Delhi
NAAC Accredited with "A" grade, New Delhi & Certified by ISO 9001:2008,
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DEPARTMENT OF INFORMATION TECHNOLOGY

R11 Regulation Course Outcomes - Program Outcomes - Program Specific Outcomes Mapping

Course	Course Outcomes	a	b	c	d	e	f	g	h	i	j	k
I Semester												
T118 - Applied Mathematics - I	CO1: Identify the different First order Differential Equations, Procedures to solve them and their physical applications.		2		1							
	CO2: Understand the Second order and Higher order Homogeneous and Non Homogeneous Differential equations and Procedures to solve them.		2		1							
	CO3: Applications of derivatives Roll's Theorem and generalized mean value theorems and maxima and minima of two functions.		2		1							
	CO4: Apply Integration to find length, area and volume of any given surface.		2		1							
	CO5: Understand the analogy of the Fundamental Theorem of Calculus to Vector Calculus.		2		1							
T131 - C Programming	CO1: Understand the basic concepts of programming languages.	1	1									
	CO2: Design the programs using decision constructs, loops and functions.		1	1								
	CO3: Understand the dynamic memory allocation using pointers.					1						
	CO4: Develop C programs using Structures and Unions.		1	2								
	CO5: Implement various file accessing methods.		1	2								
T197-English-I	CO1: Read, write and aptly understand what ever is written and spoken in English.							1				
	CO2: Speak fluently with acceptable pronunciation and write using appropriate words, spellings, grammar and syntax.							1				
	CO3: Read the lines, between lines and beyond lines excelling in comprehension skills.							1				
	CO4: Draft Reports, memos, mails & letters as part of their work.							1				
	CO5: Speak grammatically error free English.							1				
T191-Engineering Chemistry	CO1: Analyze the quality of water and its maintenance for industrial purposes.				1							
	CO2: Analyze issues related to fuels and their synthesis and able to understand working of IC and Diesel engines.				1							
	CO3: Realize the principles of corrosion and make use of the principles for maintenance of various equipments more effectively.				1							
	CO4: Get hands on experience in various processes like polymerization, preparation, properties and applications of plastics and rubbers.				1							
	CO5: Acknowledge the important aspects of refractory materials , realize the use of thermal electrical insulators and lubricants in various technological applications				1							
P806-C Programming Lab	CO1: Implement basic concepts of C Programming, and its different modules that includes conditional and looping expressions, Arrays, Strings, Functions, Pointers, Structures and File programming	1	1	2								
	CO2: Design the programs to solve real world minor scale problems	1	1	2								

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P830-Engineering Physics &	CO1: Understand the principle, operation, applications involved in mechanical experiments.				1							
	CO2: Gain the knowledge, phenomenon involved in the optical experiments..				1							
	CO3: distinguish different types of titrations in volume metric analysis.				1							
	CO4: Asses quality of water based on the procedures given.				1							
P831-Engineering Workshop	CO1: Uphold and instruct different safety precautions to be ensured in the act of doing something with the tools in industries.							2	2			
	CO2: Make use of tools perfectly and well informed way with the skill that has been acquired to eliminate technical errors in production and design accurately.							2	2			
II - Semester												
T119-Applied Mathematics- II	CO1: Apply the concepts of Laplace Transforms on Operational Calculus and solve Differential Equations of any order.		1		1							
	CO2: Express most of the single valued functions in the form of Fourier series and extend the ideas and techniques to non-periodic functions also.		1		1							
	CO3: Express a function as a continuous frequency resolution using Fourier Transforms.		1		1							
	CO4: Demonstrate Proficiency in the basic concepts of partial differential equations and develop solutions for solving initial and boundary value problems.		1		1							
	CO5: Understand the analogy between Laplace Transform and Z-Transform and apply it wherever necessary.		1		1							
T198-English -II	CO1: Read, write and aptly understand what ever is written and spoken in English.							1				
	CO2: Speak fluently with acceptable pronunciation and write using appropriate words, spellings, grammar and syntax.							1				
	CO3: Read the lines, between lines and beyond lines excelling in comprehension skills.							1				
	CO4: Draft Reports, memos, mails & letters as part of their work.							1				
	CO5: Speak grammatically error free English							1				
T264-Numerical Methods	CO1: Analyze rank and solve the system of equations by using different methods and find Eigen values and Eigen vectors of a given matrix.		1		1							
	CO2: Understand the techniques of solving any algebraic, transcendental equations and converting quadratic form to canonical form.		1		1							
	CO3: To make effective use of the interpolation formulas to find the missing data using the given data.		1		1							
	CO4: Integration of a function within specified limits and differentiate a function at any particular point without actually doing integration or differentiation.		1		1							
	CO5: Solving of ordinary differential equations by using various numerical techniques and fit a curve to the given data points.		1		1							
T154-Data structures	**CO1**: Understand Concepts of Object Oriented Programming using C++.	1	2									
	CO2: Implement features of Object Oriented Programming.		1	1								
	CO3: Analyze various Searching and Sorting Techniques.		1	2								

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Structures Using C++	**CO4**: Understand & Implement Linear Data Structures-Stacks and Queues.		1	2								
	CO5: Apply Data Structures Concepts to solve problems of minor scale.		1	2	1							
T188-Electronic Devices and Circuits	CO1: Find the Resistor Color coding , Series & parallel Resistance	1			2							
	CO2: Know the Characteristics of PN and Zener diodes				2							
	CO3: Understand Full wave Rectifier without & with filters	1										
	CO4: Understand Transistor CE characteristics	1										
	CO5: Analyze different Amplifiers.				2							
P816-Data	**CO1**: Understand & Implement Object Oriented Programming Concepts	1	1	2								
	CO2: Analyze and implement Various Data Structures Using C++	1	1	2	2							
P829-Engineering Drawing	CO1: Create database and reduce time required in synthesizing, analyzing and documenting the designs very accurately and also helpful for communicating effectively**.**			1	2							
	CO2: Apply aesthetic features to the drawings which attract the attention of the manufacturing personnel thereby propitious in eliminating technical errors efficiently.			2	1							
P827 - Electronic	CO1: Find the Resistor Color coding, Series & parallel Resistance.	1			2							
	CO2: Know the Characteristics of PN and Zener diodes.	1			2							
- Mini Proje	CO1: Appreciates the practical aspects in transforming an idea/problem statement into a working model.				1		1	1	1	2	1	2
	CO2: Improves communication skills and team skills.				1		1	1	1	2	1	2
III - Semester												
T127-Basic Electrical Engineeri	CO1: Analyze different types of electrical and magnetic circuits.				2							
	CO2: Identify a suitable machine for particular application.				2							
	CO3: Use the techniques to measure efficiency and regulation of AC Machines.				2							
	CO4: Understand the working of electrical and electronics measuring instruments.				2							
T285-Probability and Statistics	CO1: Apply knowledge of mathematics, science and engineering.		1		1							
	CO2: Design and conduct experiments, as well as to analyze and interpret data.		1		1							
	CO3: Apply the methods of sampling and estimation of parameters.		1		1							
	CO4: Identify, formulate and solve problems based on sample tests.		1		1							
	CO5: Understand the techniques, skills and modern probabilistic and statistical tools necessary for engineering practice.		1		1							
T162-Digital Logic Design	CO1: Understand logical functions using Boolean algebra and complex Digital Logic circuits using Logic Gates	1				2						
	CO2: Analyze Complex Equations by using methods like map method etc.,	1				2						
	CO3: Design modular combinational logic circuits containing decoders, multiplexers, demultiplexers, 7-segments display decoders and adders.	1		2		3						
	CO4: Design of sequential circuits using functionality of flip-flops.	1		2		3						
	CO5: Understand various Programmable Logic Devices	1				2						
T103-	CO1: Understand the basic concepts of Java.	1	2									

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Advanced Data Structures through	CO2: Implement the concepts Inheritance, Interfaces and Exception Handling.		1	2								
	CO3: Design the multithreaded and Applet programs.		1	2								
	CO4: Implement Hashing Techniques, Heaps and Priority Queues.		1	2	2							
	CO5: Implement the different Data Structures related to Trees.		1	2	2							
T334-Unix Programming	CO1: Understand the basic UNIX commands and file system.	1	2									
	CO2: Develop shell scripts of medium complexity.		1	2								
	CO3: Develop the scripts to automate the jobs and understands the process creation		1	2								
	CO4: Construct regular expressions and can use **"SED"** effectively	1	2		3							
	CO5: Uses awk for text processing.		1									
P801-Advanced	CO1: Implement the Stand alone programs and GUI Application programs.		1				1		3			
	CO2: Implement the different Data Structures and their Operations.		1				1		3			
P880-Unix	CO1: Use the basic UNIX commands and write shell scripts of medium complexity		1	2								
	CO2: Develop the scripts to automate jobs and develop the scripts using sed and awk.		1	2								
P832-English language	CO1: To expose the students to the basic knowledge of thermal equipments an develop them to develop experimental skills				1			2				
	CO2: To expose students to Articulate English with good pronunciation.				1			2				
P870-Seminar - I	CO1: equips the Student with the skills of identifying a topic, collect data about the topic, prepare a report and present it to the audience.							1		1		1
	CO2: Analyze the problems, To improve communication skills and presentation skills.							1		1		1
IV - Semester												
T155-Database Management Systems	CO1: Design a Database from the user requirements.			1					2			
	CO2: Use SQL to retrieve data from Database using complex queries.		1						3			
	CO3: Normalize the Databases and appriciates the reduction in redundancy.	1							3			
	CO4: Understand how the transactions are processed in databases.	1										
	CO5: Develops an insight into concurrency control.	1										
T146-Computer Organization	CO1: Understand the basic concepts of a digital computer	1				2						
	CO2: Demonstrate programming proficiency using various addressing modes and data transfer instructions of the target computer.	1				2						
	CO3: Design a pipeline for consistent execution of instructions with minimum hazards and Show different ways to incorporate long latency operations in pipeline design.			2		2						
	CO4: Explore memory hierarchy and cost performance tradeoffs.			2		2						
	CO5: Analyze different communication methods related to I/O Devices and Standard I/O interfaces.			2		2						
T166-Discrete Mathematical	CO1: Understand the basic concepts of mathematical logic.	2			1							
	CO2: Analyze the Sets, Relations and Functions concepts	2			1							
	CO3: Understand Graph theory and its real time applications	1			1							
	CO4: Implement Pigeonhole Principle and its Real time applications.	2			1							

Course	Course Outcomes	a	b	c	d	e	f	g	h	i	j	k
Structures	CO5: Understand the Generating Function and Recurrence Relation	2			1							
T105-Advanced Java Programming	CO1: Understand the concept of graphical user interfaces and event-driven programming with JAVA.		1				1		3			
	CO2: Implement application for internet-based exchange of information with socket programming.		1	2			2					
	CO3: Designs distributed applications based on RMI and CORBA architectures.		1	1								
	CO4: Design web applications with database interaction using JDBC		1	1								
	CO5: Implement server side programs in the form of servlets, JSP and beans to solve real time applications		1	1								
T199-Environmental Studies	CO1: Evaluate local, regional and global environmental issues related to resources and management.											1
	CO2: Understand the implications of the ecosystems and identify the threats to global biodiversity.											1
	CO3: Address and prevent the problems related to pollution of air, water and soil.											1
	CO4: Investigate and solve social issues of the environment.											1
	CO5: Create awareness on the concept of sustainable population growth.											1
T290-Professional Ethics	CO1: Learns about dilemmas and moral issues and be able to apply these concepts to solve various Professional problems.											1
	CO2: Acquires and understanding of the basic concepts of Professional ethics and human values & also gain the practical implication of ethical theories											1
	CO3: Knows the duties and responsibilities towards the society being in engineering profession											1
	CO4: Students gain the practical implication of evacuation from risk & maintaining confidentiality											1
	CO5: Meets the global Challenges and develop the skills to sustaining in competitive Environment.											1
P817-Database	CO1: Design a Database from the user requirements.		1	1								
	CO2: Use SQL to retrieve data from Database using complex queries.		1	1								
P802-Advanced Java Programming Lab	1. Design and develop powerful GUI with AWT ,Applet and Event Handling concepts		1	1								
	2. Implements real time applications in terms of following architectures: a. Client server Architecture. b. Distributed Architecture c. Enterprise Architecture.		1	1								
Mini proje	CO1: Appreciates the practical aspects in transforming an idea/problem statement into a working model.				1		1	1	1	2	1	2
	CO2: Improves communication skills and team skills.				1		1	1	1	2	1	2
V - Semester												

Course	Course Outcomes	a	b	c	d	e	f	g	h	i	j	k
T156-Design and Analysis of	CO1: Uses divide and conquer paradigm to solve real world problems.	1	1		1							
	CO2: Identifies problems which can be solved most efficiently using greedy algorithms.		1		1							
	CO3: Apply dynamic programming paradigm for optimum solutions.		1		2							
	CO4: implement programs that use Backtracking algorithms.		1		1							
	CO5: Design and implement programs that use Branch and Bound techniques.		2	1								
T323-Theory of Computations	CO1: Design Finite Automata to recognize given patterns.	1			2							
	CO2: Writes regular expressions and understands the properties of regular expressions.	1			2							
	CO3: Design the content free grammars for given languages.	1			2							
	CO4: Design pushdown automata that recognize context free languages.	1			2							
	CO5: Design Turing machine to carry out computations.	1			2							
T267-Operating Systems	CO1: Understand the objective and functions of modern operating systems.	1				1						
	CO2: Analyze various process scheduling algorithms	1				1						
	CO3: Design the algorithms for achieving synchronization		1	2								
	CO4: Apply memory mapping techniques and cost-performance tradeoffs.	1		1								
	CO5: Implement various file management techniques			1		2						
T308-Software Engineering	CO1: Understand the fundamentals and basic concepts of software engineering	1										
	CO2: Analyze software systems in terms of various process models and practices			1								
	CO3: Analyze software systems in terms of various requirements offered by stake holders in different analysis models	1							2			
	CO4: Design, synthesize, and analyze software systems of with the knowledge of design concepts, patterns, and architectural design.	1		2								
	CO5: Apply software testing tactics and strategies for testing real time projects						1		2			
T254-Microprocessor and Interfacing	CO1: Understand the architecture of 8086 and write Assembly Language Program using 8086 instructions.				1	1		2				
	CO2: Interface memory with 8086 Microprocessor				1	1		2				
	CO3: Interface various Peripherals with 8086 Microprocessor				1	1		2				
	CO4: Use Interrupts to handle multiple I/O devices				1	1		2				
	CO5: Understand the architecture of 8051 and write Assembly Language Program using 8051 instructions				1	1		2				
P862-Operating Systems Lab	CO1: Design the algorithms for achieving synchronization and handling Deadlocks.		1	2								
	CO2: Implement the common algorithms used for both preemptive and non-preemptive scheduling of tasks in operating systems, such as priority, performance comparison, and fair-share schemes.		1	2								
P854-Micro Processors Lab	CO1: Understand the arithmetic operations like addition subtraction multiplication and division using 8086 instruction set. Understand the logical operations like shifting and rotating and BCD to HEX conversion using 8086 instruction set.				1	1		2				
	CO2: Apply the MASM tool to execute microprocessor based programs on the computer				1	1		2				

Course	Course Outcomes	a	b	c	d	e	f	g	h	i	j	k
P818-Design and	CO1: Implement algorithms using the dynamic programming, greedy method, Backtracking, Branch and Bound strategy and analyze their performance.		1	1								
	CO2: Develop solutions for problems using suitable algorithms.		1	1								
P871-Seminar – II	CO1: Understand the concepts of Information Technology, To improve the report writing skills.							1		1		1
	CO2: Analyze the problems, To improve communication skills and team Skills.							1		1		1
VI - Semester												
T145-Computer Networks	CO1: Understand basic components of a network and understand the layered architecture of networks.	1										
	CO2: Analyze different protocols proposed for channel allocation problem and understand the design issues behind data link layer.	1			2							
	CO3: Understand different routing algorithms and congestion control and can analyze the performance of a network by using various parameters.	1			2							
	CO4: Understand the services of transport layer and can analyze transport layer protocols	1			2							
	CO5: Know the functionality of different protocols and understands the basic concepts of network security.	1			2							
T265-Object Oriented Analysis and Design	CO1: Understand the importance of modeling a system from different perspectives.	1		2								
	CO2: Analyze and develop class models with supporting documentation and design interface between classes and objects.		2	2					3			
	CO3: Design class diagrams that represent static aspects of a software system.			1					3			
	CO4: Design interaction diagrams that represent the dynamic aspects of a software system and use case diagrams that capture requirements for a software system.			2					3			
	CO5: Implement a model for User Interface (UI) of a software application and measures the level of user satisfaction and software quality assurance.			2					3			
T340-Web Technologies	CO1: Design Web Pages using HTML and implement client side validation using Java Script.		2	1					2			
	CO2: Create XML documents and implements Document Object Model. Wirte programs using Java Beans.		2	1			3		2			
	CO3: Design and Create Server side applications using Servlets.		2	1			3		2			
	CO4: Build web applications using JSP.		2	1			3		2			
	CO5: Connect to the Database and display the contents of the Database in the web page.		2	1			3		2			
T152-Data Mining and Data Warehousing	CO1: Understand the importance of Data Mining as a new discipline in the IT field.	1					2					
	CO2: Understand the various kinds of Data Mining Tasks and preprocessing methods.		2		2							
	CO3: Analyze and provide solution for real world problems using mining Association techniques			1			2		2			
	CO4: Implement various mining algorithms for classification and clustering			1	2							
	CO5: Apply these mining techniques in other fields like Bio Info, Big Data etc.				2				1			
	CO1: Understand the Key Components of the Artificial Intelligence(AI) field	1					2					

Course	Course Outcomes	a	b	c	d	e	f	g	h	i	j	k
T122-Artificial Intelligence	CO2: Implement Search Strategies and Solve problems by Applying a Suitable Search Method			1	2							
	CO3: Apply Knowledge Representation	1		2								
	CO4: Develop insight into Key Aspects of Intelligent Agents	1			2							
	CO5: Understands the concepts of Machine Learning.	1					2					
T245-Managerial Economics and Financial Analysis	CO1: Analysis the fundamentals of economics such as demand, production, price , supply and investment concepts which helps in effective business administration											1
	CO2: Perceive the production functions and breakeven analysis which helps to take certain business decisions in the processes of optimum utilization of resources											1
	CO3: Interpret and distinguish the different kinds of markets and business environments											1
	CO4: The students would have in depth knowledge about the business activity ,establish the business unit and invest adequate amount of capital in order to get maximum return from select business activity											1
	CO5: Apart from the technical knowledge, the students are able to analyses and interpret the accounting statements like income & profit statement , balance sheet etc. which would help the students to take appropriate decisions related to any kind of economic activities											1
P881-Web Technologies Lab	CO1: Design dynamic and interactive web pages by embedding Java Script code in HTML.Use Java Script to validate user input.		1	2					3			
	CO2: Implement Web applications using Server-side technologes and use back-end database to support that application.		1	2					3			
P813-Computer	CO1: Simulate various routing algorithms.		1				2					
	CO2: Formulate solutions from user requirements		1	2			2		2			
P810-Comprehe	CO1: Understand the concepts of Information Technology	1					2					
	CO2: Analyze the practical industry oriented problems.			2			2					
VII - Semester												
T223-Information Security	CO1: Understand the several types of Security attacks and implement conventional encryption algorithms like DES,AES,RSA.	1			1							
	CO2: Design and implement cryptography algorithms and digital signatures.		1	1	2							
	CO3: Understands email security services and mechanisms for sending and receiving secure mails.	1			2							
	CO4:Comprehends web security services and mechanisms like SSL,TSL,SET.	1					2					
	CO5: Understand the functioning of firewall.	1					2					
T138-Cloud	**CO1:** Articulate the main concepts, key technologies, strengths, and limitations of cloud Computing and the possible applications for state-of-the-art cloud computing.	1					3					
	CO2: Understand the architecture of cloud computing, including SaaS, PasS, IaaS, Public cloud, private cloud, hybrid cloud etc.	1					3					

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Computing	**CO3:** Analyze the core issues of cloud computing such as security, privacy, and interoperability.			1			2					
	CO4: Design Customized solutions using appropriate technologies & algorithms			1			2		3			
	CO5: Analyze and evaluate various cloud computing solutions			1			2		3			
T314-Software Testing Methodologies	CO1: Understand the Purpose of Testing and Different Testing Techniques	1					2					
	CO2: Analyze the Flow Graphs and Path testing, Transaction flow testing, Data flow testing			1			2					
	CO3: Design the Domains and paths, Testing of domains			1	2							
	CO4: Implement the Paths, path products and Regular expressions, Logic Based Testing:			1	2		2					
	CO5: Apply the State, state graphs and Transition Testing, Graph matrices and Application				2		1					
T303-Sensor Networks	CO1: Understand the basic concepts of mobile computing and its applications	1					2					
	CO2: Understand the characteristics of different multiple access techniques in mobile communication.	1					2					
	CO3: Analyze Network and Transport layer protocols for mobile networks.	1					2					
	CO4: Apply knowledge of wireless sensor networks to various application areas.	1					2					
	CO5: Analyze various protocols and their design issues in WSN	1					2					
T101-Advanced Computer Architecture	CO1: Understand the principles of computer design.	1				2						
	CO2: Comprehend the concept of flow of control and Operations of the instruction set.	1				2						
	CO3: Develop an insight into instruction level parallelism through hardware and software approaches.	1				2						
	CO4: Gets a good understand of memory hierarchy.	1				2						
	CO5: Gets a good understand of multiprocessor Architecture.	1				2						
T161-Digital Image Processing	CO1: Understand how an image is stored in computer.	1										
	CO2: Apply the processing techniques to get Image Enhancement.				1		1					
	CO3: Implement the filtering techniques to restore the images.			1	2		2					
	CO4: Design the methods of morphological processing to reduce the noises in the image.			1	2							
	CO5: Analyze the segmentation techniques to recognize the objects in the image.			1								
P838-Informati	CO1: Implement various key distribution methods		1	2	2							
	CO2: Implement encryption and decryption techniques		1		1							
P808-Cloud	**CO1:** Implement Hadoop Distributed File System for storing big data.		1	2			2					
	CO2: Implement Infrastructure as a Service Using Cloud Sim.		1	2			2					
P843-Internship	CO1: Analyze any task in the Software Industry			2					2	1	1	1
	CO2: Design any task in the Software Industry			2					2	1	1	1
P878-Term Paper	CO1: Derive a problem definition for their projects			2					2	1	1	1
	CO2: Decide what work should do, what services and activities need, and how to draw conclusions etc.			2					2	1	1	1
VIII - Semester												

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T221-Industrial Management	CO1: Apply management principles to the particle situations to be in a position to know which type of business organisation structure suits										1	1
	CO2: Make decision making relating to the problems in operations and production activities there by improving the productivity by proper utilisation input factors by designing the better working methods and with better work study techniques.								2		1	1
	CO3: Improve quality of working through SQC techniques and also in a position to reduce the investment in materials through better control of inventory										1	1
	CO4: Manage people in working environment with the practices of HRM across corporate businesses										1	1
T214Human Computer Interaction	CO1: Understand the importance of User Interface.	1					2					
	CO2: Understands the Design Principle of User Interface.	1					2					
	CO3: Design the different Screen controls.			1			2					
	CO4: Develops an insight into different Interaction devices with screens.	1					2					
	CO5: Understand the multimedia data.	1					2					
T339-Web Services	CO1: Understand XML language basics and revolutions.	1					2					
	CO2: Analyze XML Name spaces and apply different presentation techniques and transformation technologies.			1			2					
	CO3: Understand SOAP messages and how they are applied for sending error messages.	1					2					
	CO4: Understand the functioning and settings of a WSDL file.	1					2					
	CO5: Implement web services and ensure security.			1	2		2					
P811-Comprehensive Viva-	CO1: Demonstrates the Understanding of the fundamentals of Information Technology.	1	2	2	2	2	2	2	2			
	CO2: Exhibits the capability to apply knowledge of fundamentals and develop understanding of advanced concepts of Information Technology.	1		1	2		2		1		1	2
P867-Project Work	CO1: Appreciates the practical aspects in transforming an idea/problem statement into a working model.				1		1	1	1	2	1	2
	CO2: Improves communication skills and team skills.				1		1	1	1	2	1	2