Sri Ramakrishna Mission Vidyalaya College of Arts and Science
Coimbatore – 641020

(An Autonomous College Re-Accredited with "A" grade by NAAC and Affiliated to Bharathiyar University, Coimbatore)

B.Voc., Degree course (Three years)

Technology in Electrical and Electronic Devices

(An UGC sponsored DDU-KAUSHAL KENDRA Programme)

SYLLABUS

(ACADEMIC YEAR 2019-2020 Onwards)

Sri Ramakrishna Mission Vidyalaya College of Arts and Science
(AUTONOMOUS)

For Students admitted from 2019-2020 & onwards

COURSE OF STUDY

- Syllabus is framed for B.VOC (Technology in Electrical and Electronic Devices) according to UGC norms and National Vocational Education Quality Framework
- There are 2 components. They are General components of 24 credits and Skill components of 36 credits.
- One credit is equal to 15 hours for theory and 30 hours for practical. Practical could be either in the campus or in the working place of the Industry.

ELIGIBILITY:

- Candidates who have successfully completed their Higher Secondary (10+2) will be eligible for admission.

PROGRAMME OUTCOMES:

The Department of Technology in Electrical and Electronic Devices provides the practical learning environment for the students which aim to meet out the industrial requirements in the field of Electrical and Electronics by providing more practical exposures and on job trainings.

The program Educational Objectives are as follows:

PO1: Provide graduates with the fundamental knowledge in science and mathematics required to understand the principles of Engineering.

PO2: Develop creative and innovative thinking ability of the students which are required for industry.

PO3: Create a technically skilled employee by imparting theoretical, practical and on job training to students.

PO4: Imparting the leadership qualities required for team work, production planning, decision making and industrial safety, so that they are work ready at exit point of the programme.

PO5: Create well disciplined and responsible citizens for the overall welfare of our nation.

PROGRAMME SPECIFIC OUTCOMES:

PSO1: Ability to apply the knowledge of basic Engineering principles in the field of Electrical and Electronics.

PSO2: Ability to design a system to meet out the desired needs of realistic constraints.

PSO3: Ability to troubleshoot and solve the problems in the area of Electronics.

PSO4: Ability to Coordinate with Multidisciplinary teams, allocate work and manage team to ensure that production deadlines and quality standards of an industry.

PSO5: Ability to use techniques, Skills and modern engineering tools required to develop new product with updated features and improved performance.

Language-I (Tamil-I)

Subject code	18KUG1TA1	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

Course Outcomes (CO)

CO1	பிழையின்றி சுயமாக பேசவும், எழுதவும் பயிற்சி பெறல்	**S**
CO2	அரசுத் துறைசார்ந்தபணிகளுக்கு (போட்டித் தேர்வு) தயார்படுத்திக்கொள்ளுதல்	**K & U**
CO3	மரபு,புதுக்கவிதைகளைஅறிந்துகொள்ளல்	**U**
CO4	மாணவர்கள் தங்களின் படைப்பாற்றலை வெளிப்படுத்திக்கொள்ளும் வாய்ப்பினை பெறுதல்.	**S**

K- Knowledge, U – Understand, S - Skill

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	L	L	L	M	L		L	L	L	M	S
CO2	L	L	L	M	L		L	L	L	M	S
CO3	L	L	L	M	L		L	L	L	M	S
CO4	L	L	L	M	L		L	L	L	M	S

S – Strong; M – Medium; L - Low

BASIC ENGLISH

Subject code	18KUG1EN1	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

Course Outcomes (CO)

CO1	Overcome his mother tongue influence gradually.	**S**
CO2	Develop confidence to face the competitive exams and interviews.	**K,U& S**

K- Knowledge, U – Understand, S – Skill

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	M	L	L	S	L		M	M	L	M	M
CO2	M	M	L	S	M		M	M	S	S	M

S – Strong; M – Medium; L - Low

MATHEMATICS – I

Subject code	18KUG1AL1	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

Course Outcomes (CO)

CO1	Analyze Mathematical techniques and applications.	**K**
CO2	Solve the problems arise in engineering.	**K,U&S**

K- Knowledge, U – Understand, S - Skill

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	L	M		S	M	M	L	L
CO2	S	S	S	M	M		S	M	M	L	L

S – Strong; M – Medium; L - Low

BASICS OF ELECTRICAL AND ELECTRONIC DEVICES

Subject code	18KUT1C01	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

Course Outcomes (CO)

CO1	Remembering the fundamentals of Electricity	**K**
CO2	Understand the construction, characteristics and Application of DC Machines	**K& U**
CO3	Understand the construction, characteristics and Application of AC Machines	**K & U**
CO4	Understand and analyze the Characteristics and specification of Electronic Devices.	**K & U**
CO5	Understand and analyze the construction and working of basic	**K,U& S**

	Electronic circuits.	

K- Knowledge, U – Understand, S - Skill

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	M		S	M	S	L	L
CO2	S	S	S	M	M		S	M	S	L	L
CO3	S	S	S	M	M		S	M	S	L	L
CO4	S	S	S	M	M		S	M	S	L	L
CO5	S	S	S	M	M		S	M	S	L	L

S – Strong; M – Medium;L – Low

SUPERVISE ASSEMBLY LINE ACTIVITIES

Subject code	19KUT1C02	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

Course Outcomes (CO)

CO1	Understand the responsibilities of supervisor.	**U**
CO2	Understand the skills required for the supervisor.	**U & S**
CO3	Apply the Safety Guidelines for Handling Electronic Assemblies and to achieve productivity	**K & U**
CO4	Apply safety procedures by understanding the importance of Electrical Safety.	**K & U**
CO5	Understand and Analyze the importance of time management.	**U**

K- Knowledge, U – Understand, S – Skill

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5

CO1	M	L	L	S	M		L	S	M	S	S
CO2	S	M	M	S	S		L	S	S	S	S
CO3	S	M	S	S	S		M	S	M	S	M
CO4	S	M	S	S	S		M	S	M	S	M
CO5	M	M	L	S	S		L	S	L	S	S

S – Strong; M – Medium; L - Low

Language-II (Tamil-II)

Subject code	18KUG2TA2	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	II

Course Outcomes (CO)

CO1	பக்தி இலக்கியகாலத்தின் சமயம்,பண்பாடு,பக்திநெறிஅறிதல்	**K**
CO2	அரசுப் போட்டித் தேர்வுகளுக்குத் தயார்படுத்திக் கொள்ளுதல்	**K &U**
CO3	பக்தி இலக்கியங்களின் வழி சைவ, வைணவம் தமிழுக்கு செய்த தொண்டினை அறிதல்	**K**

K- Knowledge, U – Understand, S - Skill

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	L	L	L	M	L		L	L	L	M	S
CO2	L	L	L	M	L		L	L	L	M	S
CO3	L	L	L	M	L		L	L	L	M	S

S – Strong; M – Medium; L – Low

PROFESSIONAL ENGLISH

Subject code	18KUG2EN2	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical	--	Sem	II

Course Outcomes (CO)

CO1	Enable to achieve good communication skills.	**S**
CO2	Enable to face interviews successfully.	**K,U& S**

K- Knowledge, U – Understand, S - Skill

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	M	L	L	S	L		M	M	L	M	M
CO2	M	M	L	S	M		M	M	S	S	M

S – Strong; M – Medium;L - Low

OFFICE AUTOMATION

Subject code	18KUG2AL2	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	II

Course Outcomes (CO)

CO1	Create basic knowledge for using computer in all fields.	**K**
CO2	Develop their presentation skills through accessing internet.	**U & S**

K- Knowledge, U – Understand, S - Skill

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	L	M		M	S	S	L	L
CO2	M	M	M	L	M		M	S	S	L	L

S – Strong; M – Medium; L - Low

LINEAR INTEGRATED CIRCUITS

Subject code	18KUT2C03	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	II

Course Outcomes (CO)

CO1	Understand the characteristics of Op-amp IC741	**K**
CO2	Understand and analyze the applications of IC741	**K & U**
CO3	Understand different types of A to D and D to A converters.	**K**
CO4	Understand the characteristics and application of timer Ic's	**K & U**
CO5	Developing competencies to analyze Linear integrated circuits by understanding the fundamentals of OP-amp and Timer IC's.	**U & S**

K- Knowledge, U – Understand, S - Skill

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	S	M	M	S		S	M	M	L	L
CO2	S	S	M	M	S		S	M	S	L	L
CO3	S	S	M	M	S		S	M	M	L	L
CO4	S	S	M	M	S		S	S	S	L	L
CO5	S	S	S	M	S		S	S	S	L	L

S – Strong; M – Medium; L – Low

ELECTRICAL AND ELECTRONIC DEVICES LAB

Subject code	18KUTE2P1	Credits	04	Year	I
No. of Lecture Hours	--	No. of Practical Hours	120	Sem	II

Course Outcomes (CO)

CO1	Analyze the characteristics of various Electrical machines	**K & U**
CO2	Analyze the characteristics of various Electronic Devices	**K & U**
CO3	Identify and analyze the waveforms of Electronic circuits.	**K & U**

K- Knowledge, U – Understand, S - Skill

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	L	S		S	M	S	L	L
CO2	S	S	S	L	S		S	M	S	L	L
CO3	S	S	S	L	S		S	M	S	L	L

S – Strong; M – Medium; L – Low

INTERNSHIP TRAINING-I

Subject code	18KUTE2I1	Credits	20	Year	I
No. of Lecture Hours	--	No. of Practical Hours	1400	Sem	II

Course Outcomes (CO)

CO1	Exposed to an organization overview.	**K& U**
CO2	Get awareness about general safety requirements in the industry.	**K & U**
CO3	Understand and follow the rules and regulations of Industry.	**U**
CO4	Handling of Equipments, Tools and instruments used in industry.	**U & S**
CO5	Practical exposure to handle abnormal & unusual conditions in industry.	**K,U& S**

K- Knowledge, U – Understand, S - Skill

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S		S	S	S	S	S
CO2	S	S	S	S	S		S	S	S	S	S
CO3	S	S	S	S	S		S	S	S	S	S
CO4	S	S	S	S	S		S	S	S	S	S
CO5	S	S	S	S	S		S	S	S	S	S

S – Strong; M – Medium; L – Low

TECHNICAL COMMUNICATION

Subject code	18KUG3EN3	Credits	4	Year	II
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	III

Course Outcomes (CO)

CO1	Overcome inhibition in speaking in a forum.	**S**
CO2	Enable to face the day to day life and official requirements.	**K,U&S**

K- Knowledge, U – Understand, S - Skill

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	M	L	L	S	L		M	M	L	M	M
CO2	M	M	L	S	M		M	M	S	S	M

S – Strong; M – Medium; L - Low

MATHEMATICS – II

Subject code	18KUG3AL3	Credits	4	Year	II
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	III

Course Outcomes (CO)

CO1	Apply the basic Mathematical calculations in business problems.	**K& S**
CO2	Understand the concepts of Linear equation, Differential and integral calculus.	**U**

K- Knowledge, U – Understand, S - Skill

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	M	L	L	S	L		S	M	M	L	L
CO2	M	M	L	S	M		S	M	S	L	L

S – Strong; M – Medium; L - Low

ENVIRONMENTAL STUDIES

Subject code	18KUG3ENS	Credits	04	Year	II
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	III

Course Outcomes (CO)

CO1	Got awareness about the environment.	**K**
CO2	Understand the need to protect our environment from pollution and develop the unpolluted society.	**U**

K- Knowledge, U – Understand, S - Skill

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	M	M	L	M	L		L	M	M	M	S
CO2	M	M	L	M	L		L	M	M	M	S

S – Strong; M – Medium; L - Low

DIGITAL ELECTRONICS

Subject code	18KUT3C04	Credits	04	Year	II
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	III

Course Outcomes (CO)

CO1	Understand various types of number systems, binary arithmetic and codes.	**K**
CO2	Remembering truth table, symbol and equation of various logic gates	**K**
CO3	Analyze combinational Logic circuits and sequential Logic circuits	**K & U**
CO4	Understand the circuit and working of Registers and digital memories.	**K**
CO5	Developing competencies to design Digital logic circuits by understanding the fundamentals of Logic gates and Flip flops.	**U & S**

K- Knowledge, U – Understand, S - Skill

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**

CO1	M	S	M	M	M		S	M	M	L	L
CO2	S	S	S	M	S		S	S	S	M	L
CO3	S	S	S	M	S		S	S	S	M	L
CO4	S	S	S	M	S		S	S	S	M	L
CO5	S	S	S	M	S		S	S	S	M	L

S – Strong; M – Medium; L - Low

PRODUCTION PLANNING AND CONTROL

Course code	18KUT3C05	Credits	04	Year	II
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	III

Course Outcomes (CO)

CO1	Understand the objectives of Production and operation managements systems.	**U**
CO2	Originate a procurement chart based on production plan for future months	**U & S**
CO3	Understand the importance of man power planning.	**U**
CO4	Understand purchasing management and inventory control	**U**
CO5	Analyze the production plan based on the product demand data.	**K & U**

K- Knowledge, U – Understand, S - Skill

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	M	S	M	S	S		M	M	S	S	S
CO2	M	S	M	S	S		M	S	S	S	M
CO3	L	M	M	S	S		M	S	S	S	S
CO4	L	M	L	S	S		M	S	M	S	M
CO5	M	M	M	S	S		M	S	S	S	S

S – Strong; M – Medium; L - Low

TECHNICAL DRAWING

Subject code	18KUG4AL4	Credits	4	Year	II
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	IV

Course Outcomes (CO)

CO1	Apply the Skill in the Geometric construction.	**K & S**
CO2	Understand and Develop the Orthographic and Isometric projections.	**U & S**
CO3	Remember the symbols widely used in Electrical and Electronics circuits.	**K & U**

K- Knowledge, U – Understand, S - Skill

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	M	S	M	L	M		M	S	M	L	L
CO2	M	S	M	L	M		M	S	M	L	L
CO3	S	S	M	L	S		M	S	M	L	L

S – Strong; M – Medium; L - Low

PRINCIPLES OF MANAGEMENT

Subject code	18KUG4EL1	Credits	4	Year	II
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	IV

Course Outcomes (CO)

CO1	Understand the basic managerial functions of an organization	**U**
CO2	Develop the leadership qualities and planning attitude	**K & U**

K- Knowledge, U – Understand, S – Skill

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**

CO1	L	L	L	S	M		L	M	M	S	S
CO2	M	M	M	S	M		L	S	S	S	S

S – Strong; M – Medium; L - Low

PROGRAMMABLE LOGIC CONTROLLER

Course code	19KUT4C06	Credits	04	Year	II
No. of Lecture	60	No. of Practical	--	Sem	IV

Course Outcomes (CO)

CO1	Remembering general block diagram and connectivity of PLC	**K**
CO2	Understand the various Classification PLC programming standards	**K & U**
CO3	Understand input, output, timer and counter instructions	**K & U**
CO4	Understand the Arithmetic and Logical Instructions	**K & U**
CO5	Understand and Write the PLC Ladder logic program for various Applications.	**K,U& S**

K- Knowledge, U – Understand, S - Skill

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	S	S	L	M		M	S	M	L	L
CO2	S	S	S	L	M		M	S	S	L	L
CO3	S	S	S	L	M		M	S	S	L	L
CO4	S	S	S	L	M		M	S	S	L	L
CO5	S	S	S	L	S		M	S	S	L	L

S – Strong; M – Medium; L - Low

DIGITAL ELECTRONICS AND PROGRAMMABLE LOGIC CONTROLLER LAB

Course code	19KUTE4P2	Credits	04	Year	II
No. of Lecture Hours	--	No. of Practical Hours	120	Sem	IV

Course Outcomes (CO)

CO1	Identify the IC no's, Truth table of logic gates	**K**
CO2	Analyze the various combinational logic circuits	**K & U**
CO3	Analyze the various sequential logic circuits	**K & U**
CO4	Understand and Write the Ladder Diagram of Programmable Logic Controller	**K,U& S**

K- Knowledge, U – Understand, S - Skill

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	S	S	L	S		S	S	S	L	L
CO2	S	S	S	L	S		S	S	S	L	L
CO3	S	S	S	L	S		S	S	S	L	L
CO4	S	S	S	L	S		S	S	S	L	L

S – Strong; M – Medium; L - Low

INTERNSHIP TRAINING-II

Subject code	18KUTE4I2	Credits	20	Year	II
No. of Lecture Hours	--	No. of Practical Hours	1400	Sem	IV

Course Outcomes (CO)

CO1	Prepare procurement schedule	**K & U**
CO2	Prepare Production plan	**K & U**
CO3	Gain self confidence and able to co-ordinate with others	**K,U& S**

K- Knowledge, U – Understand, S - Skill

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**

CO1	S	S	S	S	S		S	S	S	S	S
CO2	S	S	S	S	S		S	S	S	S	S
CO3	S	S	S	S	S		S	S	S	S	S

S – Strong; M – Medium; L - Low

Total Quality Management

Subject code	18KUG5EL2	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	V

Course Outcomes (CO)

CO1	Gain the knowledge of Quality management principles and Techniques.	**K**
CO2	Understand the importance of the Quality and apply in industry.	**U & S**

K- Knowledge, U – Understand, S - Skill

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	L	M	L	S	S		L	M	M	S	S
CO2	L	M	L	S	S		L	M	M	S	S

S – Strong; M – Medium; L - Low

Mathematics – III

Subject code	18KUG5AL5	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	V

Course Outcomes (CO)

CO1	Solve numerical algebraic equation and transcendental equations.	**K & U**
CO2	Able to solve the real world problems.	**K,U& S**
CO3	Understand Mathematical techniques and applications.	**U & S**

K- Knowledge, U – Understand, S - Skill

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	M	L	L	L	L		S	M	M	L	L
CO2	M	M	L	L	M		S	M	M	L	L
CO3	M	M	S	L	M		S	M	M	L	L

S – Strong; M – Medium;L - Low

INDIAN VALUES

Subject code	18KUG5EL3	Credits	4	Year	III
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	V

Course Outcomes (CO)

CO1	Understand the importance of our cultural and spiritual heritage	**K & U**
CO2	Know the life history of national leaders of our Country.	**U & S**

K- Knowledge, U – Understand, S - Skill

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	L	L	L	S	M		L	L	L	S	S
CO2	L	L	L	S	M		L	L	L	S	S

S – Strong; M – Medium; L - Low

MICROPROCESSOR AND MICROCONTROLLER

Subject code	18KUT5C07	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	V

Course Outcomes (CO)

CO1	Understand the architecture, addressing modes and instructions of 8085 Microprocessor.	**U**
CO2	Understand the architecture, pin diagram of 8051 Microprocessor.	**U**
CO3	Understand Addressing Modes, Data transfer and Logical instruction of 8051 Microcontroller	**K & U**
CO4	Understand Arithmetic and Branching instruction of 8051 Microcontroller	**K & U**
CO5	Analyse various interfacing application of 8051 Microcontroller.	**K & S**

K- Knowledge, U – Understand, S - Skill

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**		**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	S	S	L	S		S	S	S	L	L
CO2	S	S	S	L	S		S	S	S	L	L
CO3	S	S	S	L	S		S	S	S	L	L
CO4	S	S	S	L	S		S	S	S	L	L
CO5	S	S	S	L	S		S	S	S	L	L

S – Strong; M – Medium; L - Low

DEVELOP HARDWARE PRODUCT FOR MANUFACTURING

Subject code	18KUT5C08	Credits	04	Year	III

No. of Lecture Hours	60	No. of Practical Hours	--	Sem	V

Course Outcomes (CO)

CO1	Identify Material requirement and selection of supplier	**K & U**
CO2	Understand various planning and work study	**U**
CO3	Recognize the requirements for developing the hardware product	**U & S**
CO4	Understand the basic troubleshooting procedure in Electronic Equipments	**U**
CO5	Analyze Quality control and waste management	**K & S**

K- Knowledge, U – Understand, S - Skill

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	S	M		L	M	M	S	S
CO2	M	M	M	S	M		L	M	M	S	S
CO3	S	S	S	L	S		S	S	S	L	L
CO4	S	S	S	L	S		S	S	S	L	L
CO5	S	M	M	S	S		M	S	S	S	S

S – Strong; M – Medium; L - Low

PROFESSIONAL ETHICS AND HUMAN VALUES

Subject code	18KUG6EL4	Credits	4	Year	III
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	VI

Course Outcomes (CO)

CO1	Create awareness of Ethics and moral values.	**K & U**
CO2	Understand the importance of Ethics and code of conduct in business.	**K & U**
CO3	Understand social responsibility in business and importance of human values	**U & S**

K- Knowledge, U – Understand, S - Skill

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	L	L	L	S	M		L	L	L	S	S
CO2	L	L	L	S	M		L	L	L	S	S
CO3	L	L	L	S	M		L	L	L	S	S

S – Strong; M – Medium; L - Low

Safety Engineering

Subject code	18KUG6EL5	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	VI

Course Outcomes (CO)

CO1	Understand the importance of safety.	**U**
CO2	Able to handle the materials and tools safely.	**K,U& S**
CO3	Follow the road and electrical safety.	**U & S**

K- Knowledge, U – Understand, S - Skill

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	S	M		M	M	M	S	S
CO2	S	S	S	S	S		S	S	S	S	S
CO3	S	S	S	S	S		S	S	S	S	S

S – Strong; M – Medium; L - Low

Entrepreneurship Development

Subject code	18KUG6EL6	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	VI

Course Outcomes (CO)

CO1	Understand concept of finance institutions, project report, incentives and subsidies.	**U**
CO2	Develop the qualities to become an entrepreneur	**K,U& S**

K- Knowledge, U – Understand, S - Skill

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	M	M	L	S	M		L	M	M	S	S
CO2	M	M	M	S	M		L	M	M	S	S

S – Strong; M – Medium; L - Low

MICROPROCESSOR AND MICROCONTROLLER LAB

Subject code	18KUTE6P3	Credits	04	Year	III
No. of Lecture Hours	--	No. of Practical Hours	120	Sem	VI

Course Outcomes (CO)

CO1	Able to write an Assembly Language Arithmetic program of 8085 Microprocessor and 8051 Microcontroller.	**K,U& S**
CO2	Able to write an Assembly Language Interfacing program of 8051 Microcontroller.	**K,U& S**

K- Knowledge, U – Understand, S - Skill

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	L	M		S	S	S	L	L
CO2	S	S	S	L	M		S	S	S	L	M

S – Strong; M – Medium; L - Low

PROJECT

Subject code	18KUTE6PR	Credits	04	Year	III
No. of Lecture Hours	--	No. of Practical Hours	120	Sem	VI

Course Outcomes (CO)

CO1	Develop Electronic Hardware working model suitable for real practical environment.	**K,U& S**
CO2	Develop the production plan	**K,U& S**

K- Knowledge, U – Understand, S - Skill

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S		S	S	S	S	S
CO2	S	S	S	S	S		S	S	S	S	S

S – Strong; M – Medium; L - Low

INTERNSHIP TRAINING-III

Subject code	18KUTE6I3	Credits	20	Year	III
No. of Lecture Hours	--	No. of Practical Hours	1400	Sem	VI

Course Outcomes (CO)

CO1	Gain practical knowledge along with work experience in addition to their academic credits	**K,U& S**
CO2	Develop the skills which are required to get employment or to become an Entrepreneur.	**K,U& S**

K- Knowledge, U – Understand, S - Skill

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S		S	S	S	S	S
CO2	S	S	S	S	S		S	S	S	S	S

S – Strong; M – Medium; L - Low

CURRICULUM OUTLINE
SEMESTER – I

Course Code	Part	Name of the Course	Lecture / Practical Hrs		Duration of Exam in Hours	Marks		Total Marks	Credits
			Lecture	Practical / Field Work		Internal	External		
GENERAL EDUCATION COMPONENT									
18KUG1TA1	I	Tamil I	60	-	2	50	50	100	4
18KUG1EN1	II	Basic English	60	-	2	50	50	100	4
18KUG1AL1	III	Allied I: Mathematics- I	60	-	2	50	50	100	4
Sub Total (A)			**180**	**-**	**06**	**150**	**150**	**300**	**12**
VOCATIONAL EDUCATION COMPONENT									
18KUT1C01	III	Core I: Basics of Electrical and Electronic Devices	60	-	2	50	50	100	4
19KUT1C02	III	Core II: Supervise assembly line activities	60	-	2	50	50	100	4
Sub Total (B)			**120**	**-**	**04**	**100**	**100**	**200**	**08**
Total (A +B)			**300**	**-**	**10**	**250**	**250**	**500**	**20**

T-Theory

P-Practical

SEMESTER – II

Course Code	Part	Name of the Course	Lecture / Practical Hrs		Duration of Exam in Hours	Marks		Total Marks	Credits
			Lecture	Practical / Field Work		Internal	External		
GENERAL EDUCATION COMPONENT									
18KUG2TA2	I	Tamil II	60	-	2	50	50	100	4
18KUG2EN2	II	Professional English	60	-	2	50	50	100	4
18KUG2AL2	III	Allied II: Office Automation	60	-	2	50	50	100	4
Sub Total (A)			**180**	**-**	**06**	**150**	**150**	**300**	**12**
VOCATIONAL EDUCATION COMPONENT									
18KUT2C03	III	Core III: Linear Integrated Circuits	60	-	2	50	50	100	4
18KUTE2P1	III	Practical I: Electrical and Electronic Devices Lab	-	120	3	50	50	100	4
18KUTE2I1	III	Internship Training-I	-	1200	3	100	300	400	20
Sub Total (B)			**60**	**1320**	**08**	**200**	**400**	**600**	**28**
Total (A +B)			**240**	**1320**	**14**	**350**	**550**	**900**	**40**

T-Theory

P-Practical

SEMESTER – III

Course Code	part	Name of the Course	Lecture / Practical Hrs		Duration of Exam in Hours	Marks		Total Marks	Credits
			Lecture	Practical / Field Work		Internal	External		
GENERAL EDUCATION COMPONENT									
18KUG3EN3	II	Technical Communication	60	-	2	50	50	100	4
18KUG3AL3	III	Allied III: Mathematics-II	60	-	2	50	50	100	4
18KUG3ENS	IV	Environmental studies	60	-	2	50	50	100	4
Sub Total (A)			**180**	**-**	**06**	**150**	**150**	**300**	**12**
VOCATIONAL EDUCATION COMPONENT									
18KUT3C04	III	Core IV: Digital Electronics	60	-	2	50	50	100	4
18KUT3C05	III	Core V: Production planning and Control	60	-	2	50	50	100	4
Sub Total (B)			**120**	**-**	**04**	**100**	**100**	**200**	**08**
Total (A +B)			**300**	**-**	**10**	**250**	**250**	**500**	**20**

T-Theory

P-Practical

SEMESTER – IV

Course Code	Part	Name of the Course	Lecture / Practical Hrs		Duration of Exam in Hours	Marks		Total Marks	Credits
			Lecture	Practical / Field Work		Internal	External		
GENERAL EDUCATION COMPONENT									
18KUG4AL4	III	Allied IV: Technical Drawing	60	-	2	50	50	100	4
18KUG4EL1	III	Elective I: Principles of Management	60	-	2	50	50	100	4
18KUG4VAD	IV	Value Education	60	-	2	50	50	100	4
Sub Total (A)			**180**	**-**	**06**	**150**	**150**	**300**	**12**
VOCATIONAL EDUCATION COMPONENT									
19KUT4C06	III	Core VI: Programmable Logic Controller	60	-	2	50	50	100	4
19KUTE4P2	III	Practical II: Digital Electronics And Programmable Logic Controller Lab	-	120	3	50	50	100	4
18KUTE4I2	III	Internship Training-II	-	1200	3	100	300	400	20
Sub Total (B)			**60**	**1320**	**08**	**200**	**400**	**600**	**28**
Total (A +B)			**240**	**1320**	**14**	**350**	**550**	**900**	**40**

T-Theory

P-Practical

SEMESTER – V

Course Code	Part	Name of the Course	Lecture / Practical Hrs		Duration of Exam in Hours	Marks		Total Marks	Credits
			Lecture	Practical / Field Work		Internal	External		
GENERAL EDUCATION COMPONENT									
18KUG5EL2	II	Elective II: Total Quality Management	60	-	2	50	50	100	4
18KUG5AL5	III	Allied V: Mathematics –III	60	-	2	50	50	100	4
18KUG5EL3	III	Elective III: Indian Values	60	-	2	50	50	100	4
Sub Total (A)			**180**	**-**	**06**	**150**	**150**	**300**	**12**
VOCATIONAL EDUCATION COMPONENT									
18KUT5C07	III	Core VII: Microprocessor and Microcontroller	60	-	2	50	50	100	4
18KUT5C08	III	Core VIII: Develop Hardware product for Manufacturing	60	-	2	50	50	100	4
Sub Total (B)			**120**	**-**	**04**	**100**	**100**	**200**	**08**
Total (A +B)			**300**	**-**	**10**	**250**	**250**	**500**	**20**

T-Theory

P-Practical

SEMESTER – VI

Course Code	Part	Name of the Course	Lecture / Practical Hrs		Duration of Exam in Hours	Marks		Total Marks	Credits
			Lecture	Practical / Field Work		Internal /Theory	External/ Practical		
GENERAL EDUCATION COMPONENT									
18KUG6EL4	III	Elective IV: Professional Ethics and Human Values	60	-	2	50	50	100	4
18KUG6EL5	III	Elective V: Safety Engineering	60	-	2	50	50	100	4
18KUG6EL6	III	Elective VI: Entrepreneurship Development	60	-	2	50	50	100	4
Sub Total (A)			**180**	**-**	**06**	**150**	**150**	**300**	**12**
VOCATIONAL EDUCATION COMPONENT									
18KUTE6P3	III	Practical III: Microprocessor and Microcontroller Lab	-	120	3	50	50	100	4
18KUTE6PR	III	Project	-	120	3	50	50	100	4
18KUTE6I3	III	Internship Training-III	-	1200	3	100	300	400	20
Sub Total (B)			**-**	**1440**	**09**	**200**	**400**	**600**	**28**
Total (A +B)			**-**	**1440**	**15**	**350**	**550**	**900**	**40**

T-Theory

P-Practical

COURSE	CREDITS	MARKS
Tamil	8	200
English	12	300
Part III: Core & Elective Allied	132 20	3000 500
Environmental Studies	4	100
Value Education	4	100
Total	**180**	**4200**

TAMIL-I

Course code	18KUG1TA1	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

அலகு I மரபுக்கவிதை

1. பாரதியார் - கண்ணன் என் தாய்
2. கண்ணதாசன் - தத்துவப் பாடல்கள் - அவன் தான் இறைவன்
3. பட்டுக்கோட்டை கல்யாணசுந்தரம் - செய்யும் தொழிலே தெய்வம்

அலகு II புதுக்கவிதை - I

1. கவிஞர் வாலி - தூக்கத்தில் ஒரு துவந்த யுத்தம் - (நிஜகோவிந்தம்)
2. வைரமுத்து - அவன் கலைமகளுக்குப் பாடஞ் சொல்லுகிறான் (திருத்தி எழுதிய தீர்ப்புகள்)
3. சௌந்திரா கைலாசம் - தெய்வீகம் - வளம்பெற வரம் தருவாள் (சௌந்திரா கைலாசம் கவிதைகள்)

அலகு III

1. சேதுபதி - இந்திய மாணவர் - (கனவுப்பிரதேசங்களில்)
2. ந. பிச்சமூர்த்தி - அக்னி (பிச்சமூர்த்தி கவிதைகள்)

அலகு IV - பயன்பாட்டுத் தமிழ்

1. விண்ணப்பக் கடிதம் எழுதப் பயிற்சி
2. வல்லினம் மிகும் இடங்கள்
3. வல்லினம் மிகா இடங்கள்
4. பிழை நீக்கி எழுதுதல்

அலகு V இலக்கிய வரலாறு - I

1. சிறுகதையின் இலக்கியத் தோற்றமும் வளர்சியும்
2. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்.

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BASIC ENGLISH

Course code	18KUG1EN1	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

UNIT-I

Noun, Pronoun, Adjective, Verb, Adverb, Preposition, Conjunction, Interjection

UNIT-II

Verbs and classification: Main Verb, auxiliary verb, transitive verb, intransitive verb and phrasal verb. Tenses: simple present, present continuous, present perfect, present perfect continuous. Past: Simple past, past continuous, past perfect, past perfect continuous. Future: simple future, future continuous, future perfect, future perfect continuous. Voices: Active and Passive voice.

UNIT-III

Infinitives, Participles, Gerunds and Question Tags, WH questions.

UNIT-IV

Sentence construction, types of sentences: Declarative sentence, interrogative sentence, imperative sentence, exclamatory sentence, affirmative and Negative sentences.

UNIT-V

Linkers, Spotting Errors, Concord.

PRESCRIBED TEXT:

Effective English Communication for you- V. Syamala (Emerald Publishers)

SUGGESTED READING:

1) Modern English- N.Krishnasamy (Macmillan)
2) Pillai, Radhakrishna G.English Grammar and Composition. Chennai: Emerald Publishers,2005

MATHEMATICS – I

Course code	18KUG1AL1	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

UNIT - I

Set and Functions: Introduction – Properties of operations on sets – De Morgan's laws – verification examples – Venn diagrams – formula for $n(AUBUC)$ – Functions.

UNIT – II

Sequences and series of real numbers: Introduction – Sequences – Arithmetic Progression (A.P) – Geometric Progression (G.P) – Series.

UNIT – III

Algebra: Solving Linear Equations – Polynomials – Synthetic division – Greatest Common Divisor (GCD) – Least Common Multiple (LCM) – Rational Expressions – Square root – Quadratic equations.

UNIT – IV

Matrices-I: Introduction – Types of Matrices – Additional and subtraction – Multiplication – Matrix equation.

UNIT – V

Matrices-II: Inverse of a matrix – Rank of a matrix – Solution of simultaneous linear equations.

Text Books:

1. Basic Mathematics, Science Series Rupa, Rupa Publications.

2. Business Mathematics and Statistics by PA. Navnitham, Jai Publishers, 2012.

BASICS OF ELECTRICAL AND ELECTRONIC DEVICES

Course code	18KUT1C01	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

UNIT I: FUNDAMENTALS OF ELECTRICITY

Definition and Units of Voltage, Current, Potential Difference, Power, Energy, Resistance, Conductance, Resistivity - Concepts of open and short circuit - Ohm's Law –Kirchoff's Current and Voltage law (Definition only) - Series circuits - Parallel circuits – Series Parallel Circuits – Simple problems on Ohm's law. AC and DC circuits-sources and its applications - Definition of cycle, frequency, time period, amplitude, peak value, average value and rms value – Define peak factor and form factor - Concept of phase , phase difference and phase angle – Single phase and 3 phase (Definition) - Meaning of lagging and leading sine wave - Advantages of three phase over single phase

UNIT II: D.C. MACHINES

DC Generator – construction- Working principle - characteristics–types- Applications DC motor- construction- Working principle - characteristics–types- Applications Necessity of starter - 3 point starter, 4 point starter

UNIT III: A.C.MACHINES AND TRANSFORMERS

Single phase Induction motor - construction & principle of operation-Types
Three phase induction motors – Squirrel cage and slip ring Induction motors (construction and working principle only)
Alternator- construction – Principle of operation
Necessity of starters – DOL and star/delta, auto transformer –application
Single Phase transformer: Working Principle and Construction of transformer – Applications – Step up and Step down transformer (Definition only)

UNIT IV: ELECTRONICS DEVICES

Types of materials – Conductor, semiconductor, insulator
DIODES: Working principle and characteristics of PN junction diode – Zener diode – Varactor diode – its specification.
TRANSISTOR: Working principle and characteristics of BJT- FET-UJT - types and specification.
POWER ELECTRONIC DEVICES: Working principle and characteristics of SCR- DIAC-TRIAC – IGBT - types and specification.
OPTOELECTRONIC DEVICES: Working principle and characteristics of LDR- LED-Photo Transistor – Photo Diode – Thermister- types and specification.

UNIT V: ELECTRONIC CIRCUITS

RECTIFIER: Construction, working and output waveform of half wave rectifier – Full wave rectifier – Bridge rectifier – its Application.
WAVE SHAPING CIRCUIT: Clipper – clamper – voltage doubler – multivibrator and its types.

REGULATED POWER SUPPLY: Need of RPS – Block diagram of RPS – Transistorized RPS – short circuit protection.

REFERENCE BOOKS:

- Electric Circuit Theory Dr.M.Arumugam Dr.N.Premkumaran Khanna Publishers, New Delhi
- Electrical machines - K.Bhattacharya, Principal, TTTI, Chandigar Tata McGraw Hill Publishing Company, New Delhi
- A course of Electrical Engineering -B.L.Theraja, S.Chand and Co., New Delhi
- Electronic Devices and Circuits - Salivahanan, N.Sureshkumar and A.Vallavaraj Tata McGraw Hill Publishing Company, New Delhi.
- Electrical Equipment Handbook: Troubleshooting & Maintenance, The Mc Graw-Hill, Company,Inc

SUPERVISE ASSEMBLY LINE ACTIVITIES

Course code	19KUT1C02	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

UNIT I: SUPERVISOR RESPONSIBILITIES
Introduction – Responsibilities to the middle and top management - Responsibilities to the Co workers - Responsibilities to the other supervisor - Responsibilities to the staff – Responsibilities in Labor matter.

UNIT II: SUPERVISORY SKILLS
Communication with others – planning process – Technical competence – Team work and sharing of Knowledge – Training and development of workers – maintain workers discipline and productivity – Department administration – duty routine activities.

UNIT III: HANDLING ELECTRONIC ASSEMBLIES
EOS/ESD PREVENTION: Electrical Overstress (EOS) – Electrostatic Discharge (ESD) – Working cables – Protective materials – EOS/ESD safe workstation.
HANDLING CONSIDERATION: Guidelines – physical damage – contamination – Electronic Assemblies- After soldering – gloves & finger cots.

UNIT IV: ELECTRICAL SAFETY
Theory of Electricity – Hazards of Electricity – Effects of Electricity on Human body – common workplace circuits – Electrical protective devices – Grounding.

UNIT V: TIME MANAGEMENT
Introduction – Goal setting – tools for prioritization –managing interruptions – managing procrastination – scheduling.

REFERENCE:

- Training manual on supervisory skills – WOPAC training and service center, cebu, Phillipines
- Production and Operations Management – Pannerselvam, PHI
- Acceptability of. Assemblies – developed by IPC (IPC-A-610D)
- Successful Time management – www.bookboon.com

TAMIL-II

Course code	18KUG2TA2	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	II

அலகு I சைவ இலக்கியங்கள்

1. திருஞானசம்பந்தர் - திருநீற்றுப் பதிகம் - (“மந்திரமாவது நீறு …” எனத் தொடங்கும் பதிகம்)
2. திருநாவுக்கரசர் - திருஅங்கமாலை - (“ தலையே நீ வணங்காய்” எனத் தொடங்கும் பதிகம்)

அலகு II வைணவ இலக்கியங்கள்

1. ஆண்டாள் - நாச்சியார் திருமொழி - 6 ஆம் திருமொழி (வாரணமாயிரம் எனத் தொடங்கும் 10 பாடல்கள்)
2. நம்மாழ்வார் - திருவாய் மொழி - (“முனியே நான்முகனே” எனத் தொடங்கும் 10 பாடல்கள்)

அலகு III சிற்றிலக்கியங்கள் - பிற்கால இலக்கியம்

1. குமர குருபரர் - மதுரை மீனாட்சியம்மை பிள்ளைத் தமிழ்
   1. தாலப் பருவம் - (31)
      (“முதுசொற் புலவர் தெளித்த” எனத் தொடங்கும் பாடல்)
   2. அம்புலிப் பருவம் (72)
      (“ஏடகத்தெழுதாத” எனத் தொடங்கும் பாடல்)
2. தாயுமானவர் - எந்நாட்கண்ணி - (தெய்வ வணக்கம் - 11 கண்ணிகள்)

அலகு IV இலக்கிய வரலாறு - II

பன்னிரு திருமுறைகள்

அலகு V இலக்கிய வரலாறு – III

பன்னிரு ஆழ்வார்கள்

PROFESSIONAL ENGLISH

Course code	18KUG2EN2	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical	--	Sem	II

UNIT- I

Formal and Informal Communication.

Language for debate and discussion, Students' classroom language. Teacher's classroom language.

Situational English: welcome and thankfulness, making an appointment, asking about educational qualifications, at the post office, a customer at a bank, other situational conversations, visiting a doctor, travelling in a bus, hiring a taxi, at the railway station, reservation for air tickets, meeting after long interval, shopping, outing, watching television, looking for a room in a hotel, and going to the theatre.

UNIT –II

Public speaking skills, extempore, group discussion, job interview, mock sessions and current affairs.

UNIT –III

Writing paragraph, writing stories, picture comprehension, note writing, and note making.

UNIT –IV

Drafting an e-mail, report writing, writing letters, application, and resume preparation.

UNIT –V

Life Skills:

a. Career planning
b. Motivation
c. Motivated goal setting
d. Team work skills
e. Time management skills.

Prescribed Texts :

1. T.M. Farhathullah: *English Practice Book for Undergraduates*. Emerald Publishers.
2. S. Raghavan : *A Textbook for Communication and Life Skills Practical*. Jey Publications.

OFFICE AUTOMATION

Course code	18KUG2AL2	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	II

UNIT-I

BASIC COMPUTER SKILLS: Identifying Major Computer Components - How Computers Work - Turning on the Computer and Logging On - OPERATING SYSTEMS AND SOFTWARE – INTERNET.

UNIT-II

WORD: Introduction to Word Processing: Basic features – Full-Featured word processors – starting word – menus and toolbars – creating, editing and saving a word document – using word help – opening a document – moving multiple text selections simultaneously – link documents – creating table – working with graphics – mail merging – previewing and printing document.

UNIT-III

EXCEL: electronic spreadsheets – spreadsheet packages – starting excel – navigating in a workbook – create, name and save a new workbook – data entry-manual and automatic – correcting mistakes-spelling checker, undo and redo changes.

UNIT-IV

POWERPOINT: Presentation basics – presentation packages – starting PowerPoint – menus and toolbars – opening and saving an existing presentation – presentation using auto content wizard – presentation using design template – creating and saving a presentation using blank presentation.

UNIT-V

MS ACCESS: Use of MS Access – Controls – Customization – database design – filtering and sorting - conversation – database basics – import and export – forms – reports.

Text Book:

1. Alexis Leon, Mathews Leon, **Introduction to Computers with MS-Office,** Tata McGraw Hill Publication, 2003.

LINEAR INTEGRATED CIRCUITS

Course code	18KUT2C03	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	II

UNIT I: OPERATIONAL AMPLIFIER

Introduction to Op-amp (IC 741) – Schematic symbol for opamp – pin diagram of IC 741 – Block diagram of an opamp – Characteristics of an Ideal opamp - Simple Equivalent circuit of an opamp –op amp parameters – CMRR –Slew rate - virtual ground.

UNIT II: OPAMP APPLICATIONS

Inverting Amplifier, Non Inverting amplifier – Differential Amplifier – scale changer as a Multiplier and Divider - Summing amplifier (Simple problems)- Voltage follower - comparator - zero crossing detector - Integrator – Differentiator – Voltage to current converter – current to voltage converter –Instrumentation amplifier.

UNIT III: DIGITAL TO ANALOG CONVERTER

Basics of D/A conversion – weighted Resistor D/A Converter – R-2R Ladder D/A Converter –Specifications of DAC-Accuracy, Resolution, Monotonocity, Settling time.

UNIT IV: ANALOG TO DIGITAL CONVERTER

Basics of A/D conversion – sampling –Sample and hold circuit –quantization – Types of A/D converter – Block diagram of Flash, Successive approximation, Ramp, Dual Slope ADC – Specifications of ADC – Accuracy, Resolution, conversion time –Functional Block diagram of IC ADC 0808.

Unit V: IC555 TIMER, IC VOLTAGE REGULATORS AND THEIR APPLICATIONS.

IC 555 Timer: Pin diagram of IC 555 – Functional Block diagram of IC555 – Applications – Astable multivibrator – monostable multivibrator – Schmitt trigger – sequence Timer

IC voltage regulators: Linear fixed voltage regulator - Positive voltage regulator using IC 78xx, negative voltage regulator using IC 79xx – Adjustable voltage Regulator LM 317.

General purpose regulator using LM 723 – Pin diagram of LM 723- Low voltage and High voltage regulator using LM 723.

REFERENCE:

- Linear Integrated circuits – D.Roy choudhury & Shail.B. Jain – New age Int. Publishers – II Edition
- "Integrated circuits" – K.R. Botkar – Khanna Pulbisher's – 1996

ELECTRICAL AND ELECTRONIC DEVICES LAB

Course code	18KUTE2P1	Credits	04	Year	I
No. of Lecture Hours	--	No. of Practical Hours	120	Sem	II

ELECTRICAL MACHINES:

1. Load test on DC Shunt Generator and estimate of regulation.
2. Load test on DC Shunt Motor.
3. Load test on the given single phase transformer
4. Load test on single phase capacitor start Induction motor.

ELECTRONIC DEVICES AND CIRCUITS:

1) Identification of
   i. resistors and its color coding
   ii. inductors and its color coding
   iii. capacitors and its color coding
2) Practicing soldering techniques in DOT board.
3) Analysis the V-I Characteristic of PN junction Diode in both forward and Reverse biasing.
4) Construct the voltage regulator by using Zener Diode.
5) Construct the simple switching circuit using NPN and PNP transistor.
6) Characteristics of SCR.
7) Connect the DIAC and determine its Cut in voltage.
8) Characteristic of LED and LDR.
9) Solder the Bridge Rectifier circuit in DOT board and trace the output waveforms with and without filter.
10) Construct the Diode clipper and trace their output waveform.
11) Construct the Diode Clamper circuit and trace their output waveform.

LINEAR INTEGRATED CIRCUITS:

1. Construct and test Inverting and Non-Inverting Amplifier using operational Amplifier
2. Construct the Scale changer and summing amplifier circuit and test their output by using operational Amplifier.
3. Construct the Astable Multivibrator using IC555 timer.
4. Construct the Monostable Multivibrator using IC555 timer.
5. Construct digital to analog converter(R-2R ladder type).

INTERNSHIP TRAINING-I

Course code	18KUTE2I1	Credits	20	Year	I
No. of Lecture Hours	--	No. of Practical Hours	1200	Sem	II

OBJECTIVES:

- To Understand production requirement
- To Understand quality and safety standards as per company's norms
- To gain practical knowledge
- To develop Self confidence
- To develop a good relationship with their co-workers.

OUTCOMES:

- Students will able to understand the production requirement and safety standards
- Students will gain self confidence and they will be able to co-ordinate with others

Students should undergo internship training in an esteemed Electrical and Electronic concern to gain hands on practice and practical industrial exposure.

Students are expected to submit their daily work report at the time of examination.

TECHNICAL COMMUNICATION

Course code	18KUG3EN3	Credits	4	Year	II
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	III

UNIT-I (LISTENING)

1) Types of Listening
2) Implications of effective Listening

UNIT-II (SPEAKING)

1) Speaker, speech planning process.
2) Speech making process and speech effectiveness
3) Group Communication

UNIT-III (READING)

1) Reading Comprehension.
2) Improving comprehension skills
3) Techniques for good comprehension.

UNIT-IV (WRITING)

1) Sentence Construction
2) Techniques for Paragraph Development
3) Story Writing, Precis Writing

UNIT-V

1) Curriculum Vitae
2) Agenda, Minutes, Notices
3) Memo

PRESCRIBED TEXT:

1) Technical Communication Principles and Practice- Sangeeth Sharma & Meenakshi Raman
2) The Challenge of Effective Speaking –Thomas Wadsworth 14th ed, 2008
3) Effective English Grammar and Composition- V.Syamala, Emerald Publication.

MATHEMATICS – II

Course code	18KUG3AL3	Credits	4	Year	II
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	III

Unit I:

Simple and Compound Interest – Discounting of Bills – True Discount – Banker's Gain.

Unit II:

Variables, Constants and Functions - Limits of Algebraic functions – Simple Differentiation of Algebraic functions – Meaning of Derivative – Evaluation of first and second order derivatives

Unit III:

Elementary Integral Calculus – Determining indefinite and definite integral of simple functions – Integration by parts

Unit - IV

Expansions of $cos\ n\theta, sin\ n\theta$ and $tan\ n\theta$ - Expansion of $sin\theta$ and $cos\theta$ in a series of ascending powers of θ.

Unit - V

Hyperbolic functions - Relation between Hyperbolic functions - Inverse Hyperbolic functions - Real and Imaginary parts - Logarithm of complex numbers.

Text Book:

1. Business Mathematics and Statistics by PA. Navnitham, Jai Publishers, 2012.

2. Ancillary Mathematics (Volume I) by S. Narayanan, R. Hanumantha Rao, Manickavachagam Pillai and P. Kandaswamy, S.Viswanathan (Printers & Publishers) Pvt Ltd., 2007.

ENVIRONMENTAL STUDIES

Course code	18KUG3ENS	Credits	04	Year	II
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	III

UNIT-I

The Multidisciplinary nature of environmental studies-Definition, scope and importance. Need for public awareness-Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems.

a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effective on forests and tribal people.
b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts, over water, dams benefits and problems.

UNIT-II

Ecosystems-Concept of an ecosystem.-Structure and function of an ecosystem.-Producers, consumers and decomposers.-Energy flow in the ecosystem.-Ecological succession.-Food chains, food webs and ecological pyramids.

UNIT-III

Biodiversity and its conservation-Introduction – Definition: genetic, species and ecosystem diversity.-Biogeographical classification of India-Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.-Biodiversity at global, National and local levels-India as a mega-diversity nation-Hot-spots of biodiversity-Threats to biodiversity: habitat loss, poaching of wildlife, manwildlife conflicts.-Endangered and endemic species of India-Conversation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT-IV

Environment Pollution: Causes, effects and control measures of:Air pollution-Water pollution-Soil pollution-Marine pollution-Noise pollution-Thermal pollution-Nuclear hazards

Solid Waste Management: Causes, effects and control measures of urban and industrial wastes.

UNIT-V

Social Issues and the environment.-From Unsustainable to Sustainable development-Urban problems related to energy-Water conservation, rain water harvesting watershed management.-Resettlement and rehabilitation of people; its problems and concerns

Case studies: Environment ethics: Issues and possible solutions.

TEXT BOOK:

1. Title: ENVIRONMENTAL STUDIES – **Publication:** Published by Bharathiar University.

DIGITAL ELECTRONICS

Course code	18KUT3C04	Credits	04	Year	II
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	III

UNIT I : NUMBER SYSTEMS AND CODES

Number systems: Types - Decimal – Binary – Octal – Hexadecimal – BCD – Conversion from one number system to other.

Binary Arithmetic: Binary addition- Subtraction- 1's complement and 2's complement – Signed binary numbers- Binary addition and subtraction using1's complement and 2's complement- 9's complement and 10's complement.

CODES: Types- Binary codes, Excess 3 code, Gray code – conversion from one code to another code.

UNIT II: BOOLEAN ALGEBRA AND LOGIC GATES

Logic gates: Positive and Negative logic System - Definition, Truth table, Symbol and Logical equations of AND – OR - NOT – EXOR - EXNOR (Only 2-inputs) gates –Universal gates - NAND - NOR – Symbol and truth table .

Boolean Algebra : Basic laws of Boolean algebra – Demorgan's Theorem and proofs – Duality theorem - Simplification of logical equations using Boolean laws - De-Morgan's theorem – Four variable Karnaugh map

UNIT III: COMBINATIONAL LOGIC CIRCUITS

Half Adder and full adder- Truth table, Logic diagram – Half subtractor and Full subtractor - Truth table, Logic diagram Parity bit – Use of a parity bit – Odd parity and Even parity

Multiplexer - De multiplexer – Encoder – Decoder (Definition and Basic Circuits only) – Comparator Circuit for two three bit words.

UNIT IV: SEQUENTIAL LOGIC CIRCUITS

Flip flops: Basic principle of operation - S-R, D flip-flop – Operation and truth table - Race Condition – JK flip flop – T flip flop – Toggling - Edge Triggered Flip-flop –J-K Master Slave flip flop.

Counters: Asynchronous counter - 4 bit Asynchronous Counter – Mod N Counter - Decade counter - Synchronous counter - 4 bit Synchronous binary counter – Up and Down Counter - Applications of Counters

UNIT V: REGISTERS AND DIGITAL MEMORIES

Shift register - Block diagram representation and waveforms of Serial – in Serial - out, Serial – in Parallel – out, Parallel-in Serial – out, Parallel - in Parallel – out – Applications of Shift Registers.

MEMORIES – Classification of Semiconductor memories**-** Static Memory – Dynamic Memory – Static Memory organization in terms of address lines, control lines and data lines – Expanding memory (say 8k to 16k) – SDRAM – DDR RAM.

REFERENCE:

- R.P. Jain – Modern Digital Electronics – TMH 2003.
- Albert Paul Malvino and Donald P. Leach – Digital Principles and applications –TMH – 1991.

PRODUCTION PLANNING AND CONTROL

Course code	18KUT3C05	Credits	04	Year	II
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	III

UNIT I: PRODUCTION AND OPERATION MANAGEMENT

Introduction – Production system – objective of Production Management – Operating system – Objectives of operation management – Managing Global operations – Scope of production and Operation management.

UNIT II: PRODUCTION PLANNING

Introduction – need and objectives of PPC – Phases of PPC – Functions of PPC – Operation planning and scheduling systems – Aggregate planning – Master Production Schedule (MPS) – Material Requirement Planning (MRP) – Capacity planning – Routing – Scheduling – Scheduling Methodology.

UNIT III: MAN POWER PLANNING

Introduction- Meaning of man power planning-Importance of man power planning- Need of man power planning-Process of policy formulation-Responsibility of manpower planning- Job Analysis

UNIT IV: PURCHASING MANAGEMENT

Introduction – Procurement process –purchasing organization – sourcing – strategies – purchasing portfolio models – supplier segmentation – supplier selection with focus on choice of evaluation criteria – supplier selection using ISO standards – Supplier development with quality focus.

UNIT V: MAINTENANCE AND INVENTORY CONTROL

Introduction – objectives – types of maintenance – maintenance planning - Maintenance Scheduling – Maintenance schedule techniques – Total Productive Maintenance.

Meaning of Inventory – Reasons for keeping inventory – meaning & objectives of inventory control – Benefits and techniques of inventory control – inventory model.

REFERENCE:

- Production and Operations Management – Pannerselvam, PHI
- Production and Operation management – S.Anil Kumar & N.Suresh – New Age International Publication.
- P.C. Tripathi, Personal Management and Industrial Relations, Sultan Chand & Sons, New Delhi, 1978 (Reprint – 2004).
- Ebook for production and operation management – www.todaylibrary.com
- Purchasing management – Lars Bedes, Sofia Eklund, Nojan Najafi- CHALMERS-Department of Technology Management and Economics

TECHNICAL DRAWING

Course code	18KUG4AL4	Credits	4	Year	II
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	IV

Unit I - Geometrical construction

Triangle (Equilateral triangle, Right angle triangle, Isosceles triangle, Acute triangle) -Rectangle, Rhombus, Trapezium, Circles -Regular Polygons (Square, Pentagon, Hexagon, Heptagon, Octagon)-Parabola (Tangent method, Offset method)-Ellipse (Parallelogram method, Four centre method, Concentric circles method)-Hyperbola-Cycloids -Involutes -Helix -Spiral curves.

Unit II-Projections

Orthographic (first angle and third angle) (10 simple exercises each) - Isometric (5 simple exercises) - Oblique (2D and 3D wire frame models) (3 simple exercises) - Blue print reading (Missing views - Missing Lines - Missing dimensions)

Unit III- Sectional View

Types of sectional view (Full section, Half section, Aligned section, Offset Section, Revolved Section, Removed section) - Detailing view.

Unit IV -Electrical and Electronics Symbols

Symbols of – DC armatures – alternators – field winding shunt, series and compound – relays – contactors – fuses – main switch – electric bell – earth – aerial – DPST – DPDT – TPST – Network link – ammeters – voltmeters – wattmeter – energy meters – frequency meters – power factor meters – timers – buzzers – transformers – auto transformers- Incandescent lamp- Fluorescent Lamp -Signal lamp- Push button- Fire alarm – Siren- Water Heater- Ceiling Fan- Exhaust Fan - Resistors – inductors – capacitors - diodes – transistors – FET – SCR – UJT – DIAC – TRIAC – MOSFET'S - LOGIC GATES – AND – OR – NOT – NAND – NOR – EXOR

Unit V- Introduction to AutoCAD

History of AutoCAD-Applications- Advantages over manual drafting - hardware requirements – software requirements – window desktop – AutoCAD screen interface – menus – toolbars - How to start AutoCAD – command groups – How to execute command – types of coordinate systems – absolute-relative-polar- Simple sketches (lines and curves)

Text Books:

1) Gopalakrishnan K.R., "Engineering Drawing" (Vol I & II combined), Subhas stores, Bangalore -2007

2) Shah M.B., and Rana.B.C., " Engineering Drawing", Pearson, 2nd edition, 2009.

PRINCIPLES OF MANAGEMENT

Course code	18KUG4EL1	Credits	4	Year	II
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	IV

UNIT I: INTRODUCTION TO MANAGEMENT AND ORGANIZATIONS

Definition of Management – Science or Art – Manager – managerial roles and skills – Evolution of Management – Scientific, human relations , system and contingency approaches – Types of Business organization – Sole proprietorship, partnership, company-public and private sector enterprises –Current trends and issues in Management.

UNITII: PLANNING

Nature and purpose of planning – planning process – types of planning – objectives – setting objectives – policies – Planning Tools and Techniques – Decision making steps and process.

UNIT III: ORGANISING

Formal and informal organization – organization chart – organization structure – types – Line and staff authority – departmentalization – delegation of authority – centralization and decentralization – Human Resource Management – HR Planning, Recruitment, selection, Training and Development, Performance Management.

UNIT IV: DIRECTING

Meaning, Principles and Functions- Motivation – motivation theories – motivational techniques – job satisfaction – job enrichment – leadership – types and theories of leadership – communication – process of communication – barrier in communication – effective communication – communication and IT.

UNIT V: CONTROLLING

System and process of controlling – budgetary and non-budgetary control techniques – use of computers and IT in Management control – Productivity problems and management – direct and preventive control – reporting.

TEXT BOOKS:

1. Stephen P. Robbins & Mary Coulter, " Management", Prentice Hall (India) Pvt. Ltd., 10th Edition, 2009.

2. JAF Stoner, Freeman R.E and Daniel R Gilbert "Management", Pearson Education, 6th Edition, 2004.

விழுமியக் கல்வி (VALUE EDUCATION)

Course code	18KUG4VAD	Credits	04	Year	II
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	IV

அலகு – ஐ

விழுமியம் - சொற்பொருள் விளக்கம் - தனிமனித விழுமியங்கள் - சமூக விழுமியங்கள் - பண்பாட்டு விழுமியங்கள் - ஆன்மீக விழுமியங்கள்.

அலகு - ஐஐ

தனிமனித விழுமியங்கள் - சிந்தனைகள் தனிமனித ஒழுக்கம் - அன்பு - பொறுமை - நன்நெறி - கருணை - இரக்கம் - குற்றம் - சட்டம் - தண்டனை.

அலகு - ஐஐஐ

பண்பாட்டு விழுமியங்கள் - தமிழர்களின் பண்பாட்டு - மொழி - வீரம் - நட்பு - விருந்தோம்பல் - ஈகை - கொடை - கற்புடமை - தமிழ் கூறும் நல்லுலகம்.

அலகு - ஐஏ

சமூக விழுமியங்கள் - காந்தீய விழுமியங்கள் - பாரதி காட்டும் சமூக விழுமியங்கள் - வ. உ. சிதம்பரம் வாழ்வியல் விழுமியம்.

அலகு -ஏ

ஆன்மீக விழுமியங்கள் - குருதேவர் ஸ்ரீ ராமகிருஷ்ணர் வாழ்வும் வாக்கும் - சுவாமி விவேகானந்தரின் வாழ்வியல் நெறிகள் - புத்தர் காட்டும் ஆன்மீக விழுமியங்கள்.

குறிப்பு தயாரிக்கப்பட்ட பாடஉரை அளிக்கப்படும்

PROGRAMMABLE LOGIC CONTROLLER

Course code	19KUT4C06	Credits	04	Year	II
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	IV

UNIT I: INTRODUCTION TO PLC

Definition – Requirements of PLC – Advantages over relay logic – Block diagram – parts – operation – description & connectivity – communication – memory – PLC scanning – I/O interfacing.

UNIT II: PLC PROGRAMMING

Hand held programming terminals pcs & PLC programming – industrial computer – 1EC 1131 Programming standards – ladder diagram (LD) – functional block diagram (FBD) – instructional list structural text (ST) – sequential functional chart.

Conventional wiring diagram versus PLC ladder logic – logic fuctions – AND logic, OR logic two input & three inputs with truth table – not logic exclusive OR logic combinational logic – priority logic elements.

UNIT III: PLC INSTRUCTIONS – I

Normally open (or) Examine ON – Normally closed (or) Examine OFF – one shot instruction – Latch output coil unlatch coil

ON delay timer instruction (TON) – OFF delay timer instruction (TOFF) – Retentive timer instruction (RTO) – Counter up instruction (CTU) – Counter down instruction (CTU) – Reset instruction (RES)

UNIT IV: PLC INSTRUCTIONS – II

Equal (EQU) – Not equal (NEQ) – Less than (LES) – Less than or equal (LEQ) – Greater than (GRT) – Greater than or equal (GEQ) – Masked comparison for equal (MEQ) – Limit test (LIM)

Add (ADD) – Subtract (SUB) – Multiply (MUL) – Divide (DIV) – Clear (CLR) – Square root (SQR) -AND – OR – EX-OR – NOT

UNIT V: APPLICATIONS OF PLC

Ladder logic diagram for DOL starter – star/Delta Starter – fluid filling operation – traffic light control –two speed motor control circuit using ladder logic – Automatic rotor resistance starter control using ladder logic.

REFERENCE:

Introduction to Programmable Logic Controller - Gary Dunning, Delmar Publications
Sensors and Communication - Jon Sterner son
Programmable Logic Controllers - Peteruzella
Programmable Logic Controllers - George L Batter, Mc-Graw Hill
Programmable Logic Controllers - Colin D Simpson, Prentice Hall

DIGITAL ELECTRONICS AND PROGRAMMABLE LOGIC CONTROLLER LAB

Course code	19KUTE4P2	Credits	04	Year	II
No. of Lecture Hours	--	No. of Practical Hours	120	Sem	IV

DIGITAL ELECTRONICS:

1. Verify the truth table of the following logic gates AND, OR, NAND, NOT, NOR – using 74XX ICs and bread board.
2. Verification of De-Morgan's theorem.
3. A) Construct the EX-OR Gate by using 2 NOT Gate, 2 AND Gate and 1 OR Gate.
   b) Realization of combinational logic function using AND, OR and NOT gates. Verify the result.
4. Construct the Half adder and full adder using 7408, 7486 and 7432 ICs and verify its truth table.
5. Construct a Half subtractor and Full subtractor and verify the truth table using 74xx ICs.
6. Construct the 4 to 1 multiplexer using logic gates and verify the truth table.
7. Construct the 1 to 4 demultiplexer using logic gates and verify the truth table
8. Design and implementation of encoder and decoder using logic gates and verify the truth table.
9. Construction and verification of truth table for RS, D, T, JK, flip-flop.
10. Construct and verify the performance of a 4 bit binary counter using 7473 ICs

PROGRAMMABLE LOGIC CONTROLLER:

1. Developing the Ladder diagram for the truth table of Logic Gates.
2. Develop ladder logic program for DOL Starter and test by using PLC kit.
3. Develop ladder program for Automatic Star-Delta Starter and test by using PLC kit
4. Develop ladder program for two speed pole changing motor and test by using PLC Kit
5. Develop ladder program for Traffic light system and test by using PLC kit

INTERNSHIP TRAINING-II

Course code	18KUTE4I2	Credits	20	Year	II
No. of Lecture Hours	--	No. of Practical Hours	1200	Sem	IV

OBJECTIVES:

- To Derive a procurement chart based on production plan for future months
- To Coordinate with the procurement team
- To Complete documentation
- To develop a good relationship with their co-workers

OUTCOMES:

- Students will able to prepare procurement schedule
- Students will able to prepare production plan
- Students will gain self confidence and they will be able to co-ordinate with others

Students should undergo internship training in an esteemed Electrical and Electronic concern to gain hands on practice and practical industrial exposure.

Students are expected to submit their daily work report at the time of examination.

TOTAL QUALITY MANAGEMENT

Course code	18KUG5EL2	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	V

Unit - I INTRODUCTION

Introduction - Need for quality - Evolution of quality - Definitions of quality - Dimensions of product and service quality - Basic concepts of TQM - TQM Framework - Quality statements - Customer focus - Customer orientation, Customer satisfaction, Customer complaints, and Customer retention - Costs of quality.

Unit - II TQM PRINCIPLES

Leadership- Employee involvement - Motivation, Empowerment, Team and Teamwork, Recognition and Reward, Performance appraisal - Continuous process improvement - PDSA cycle, 5s, Kaizen - Supplier partnership - Partnering, Supplier selection, Supplier Rating.

Unit - III TQM TOOLS & TECHNIQUES I

The seven traditional tools of quality - New management tools - Six-sigma: Concepts, methodology, applications to manufacturing, service sector including IT

Unit - IV TQM TOOLS & TECHNIQUES II

Control Charts - Process Capability - Quality Function Development (QFD) - Taguchi quality loss function - TPM - Concepts, improvement needs - Performance measures.

Unit - V QUALITY SYSTEMS

Need for ISO 9000 - ISO 9001:2015, ISO 29990:2010 Quality System - Elements, Documentation, Quality Auditing - QS 9000 - ISO 14000 - Concepts, Requirements and Benefits - TQM Implementation in manufacturing and service sectors.

TEXT BOOK

1. Dale H.Besterfiled, et at., "Total Quality Management", Pearson Education Asia, Third Edition, Indian Reprint (2006).
2. Janakiraman,B and Gopal, R.K, "Total Quality Management - Text and Cases", Prentice Hall (India) Pvt. L

MATHEMATICS – III

Course code	18KUG5AL5	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	V

Unit - I

THE SOLUTION OF NUMERICAL, ALGEBRAIC AND TRANSCENDENTAL EQUATIONS: Introduction - The Bisection method -Iteration method - The Method of False Position- Newton's Iteration method.

Unit - II

INTERPOLATION: Introduction - Linear Interpolation - Gregory Newton Forward Interpolation Formula - Gregory Newton Backward Interpolation Formula - Equidistant terms with one or more missing values.

Unit - III

NUMERICAL DIFFERENTIATION: Newton's Forward Difference Formula to compute the Derivatives - Newton's Backward Difference Formula to compute the derivatives - Derivatives using Striling's formula

Unit - IV

MEASURES OF CENTRAL TENDENCIES: Arithmetic Mean, Median and Mode, Geometric mean, Harmonic mean.

Unit - V

MEASURES OF DISPERSION: Range, Mean deviation, Quartile deviation, Standard deviation, Co-efficient of variation.

Text Book:

1. Numerical methods **by** P.Kandasamy, K.Thilakavathy, K.Gunavathy, 2003 Edition.
2. Statistics, RSN. Pillai & Bhagavathi, Sultan Chand Publishers, reprint 2002.

INDIAN VALUES

Course code	18KUG5EL3	Credits	4	Year	III
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	V

UNIT I- Character formation through Positive personality

Truthfulness, Sacrifice, Sincerity, Self Control, Altruism, Tolerance, Cultivating will-power and character building - Swami Vivekananda's ideas on Personality Development – Strength - Faith in one's self – Self-confidence – Ego, overconfidence and inferiority complex .

UNIT II- Holy Mother Sarada Devi Life

Birth of holy mother- The holy life of Sarada Devi with Bahavan Sri Ramakrishna- Message of Sarada Devi to the world

UNIT III- Yoga's

Introduction to Yoga – Asanas, Pranayama & Meditation – Benefits of Yoga – Four types of Yoga (Karma yoga - Bakthi Yoga- Raja Yoga- Gnana Yoga)- Control of Mind through Yoga & Meditation.

UNIT IV- The inspirational life of Indian leaders

Rabindranath Thagore- Sri. Aurobindo- Balagangathara Thilak- Vinobabave- Nethaji Subash Chandra Bosh- Baghat singh, Rajaguru, Sukdev- Theeran Chinnamalai- Dr. A.P.J. Abdhul Kalam.

UNIT V- Importance days of India

Independence Day -Republic Day- Dandhi Salt March- Jallianwallah Bagh Massacre Day- Sepoy Mutiny- Battle of Plassey- Kargil Victory Day.

Reference books:

1. Personality development by Swami Vivekananda
2. Holy Mother by Swami Nikhilananda
3. My India, The India Eternal by Swami Vivekananda

MICROPROCESSOR AND MICROCONTROLLER

Course code	18KUT5C07	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	V

UNIT I: 8085 MICROPROCESSOR

Introduction – terms related to microprocessor – Architecture of 8085 Microprocessor Pin-out diagram of 8085 – features – of 8085 Instruction formats – Addressing mode – instruction set – Different types of instructions.

UNIT II: 8051MICROCONTROLLER

8051 Architecture – Introduction – The 8051 Oscillator and Clock –Program Counter and Data Pointer –CPU Registers – PSW – Memory Organization – Stack – Special Function Registers –– Timers – Serial Data – Input / Output – Interrupts Structure – Timer Flag Interrupt – External Interrupt – Reset – Interrupt Control – Interrupt Priority – Interrupt Destinations –Pin Configuration of 8051 and their functions.

UNIT III: INSTRUCTIONS I

Addressing modes – Immediate Addressing modes, Register addressing modes, direct addressing modes, indirect addressing modes - Data transfer instructions – Push and Pop Opcode - Logical operations – SFR Bit addresses. Bit level Boolean operations - Rotate and Swap operations.

UNIT IV: INSTRUCTIONS II

Arithmetic instructions flags – Addition - unsigned and signed addition – Subtraction - unsigned and signed subtraction – Multiplication - Division – Detailed Arithmetic – Jump and Call Instructions – Interrupts and Returns

UNIT V: INTERFACING APPLICATIONS

Introduction – interfacing 8051 with 8255 – ADC/DAC interfacing – simple keypad interface – seven segment LED display interfacing – LCD display interfacing – interfacing sensors – interfacing of stepper motor – DC motor interfacing – interfacing traffic light controller

REFERENCE:

1. Microprocessor and Microcontroller - R. Theagarajan SciTech Publication.
2. Microprocessors and Microcontrollers - M.Senthil Kumar, M.Saravanan, S.Jeevananthan
3. *8051 Architecture and Programming* - Kenneth Ayala

DEVELOP HARDWARE PRODUCT FOR MANUFACTURING

Course code	18KUT5C08	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	V

UNIT I: MATERIAL REQUIREMENT AND SUPPLIER SELECTION

Introduction – material requirement planning and control – techniques of material planning – purchasing – objective and parameters of purchasing – purchasing procedure – selection of suppliers – special purchasing systems.

UNIT II: CAPACITY , FACILITY, PROCESS PLANNING AND WORK STUDY

Capacity planning – importance – capacity measurement – planning process for manufacturing and service industry

Facility planning – location facilities – location flexibility – facility design process and techniques – locational break even analysis

Process planning – procedure – characteristics of production process systems – process from selection with PLC

Work study – significance – methods, evolution of normal/standard time – job design and rating

UNIT III: ELECTRONIC TESTING EQUIPMENTS

Multimeters – Oscilloscope – Digital Oscilloscope – Logic Analyser – Signature analyser – Signal generators – universal bridges – power supplies

UNIT IV: FUNDAMENTALS OF TROUBLESHOOTING PROCEDURES

Making of an Electronic Equipments – Reading drawings and diagrams – Equipment failures – Causes of Equipment failures – Nature of faults – Fault finding aids – Troubleshooting techniques – Approaching components for test – Grounding systems in Electronic equipment – Temperature- sensitive intermittent problems – Corrective actions.

UNIT V: QUALITY CONTROL AND WASTE MANAGEMENT IN INDUSTRY

Types of Quality control – steps in Quality control – objectives and benefits of Quality control – Seven steps for Quality control – causes of variation in Quality control – Statistical process control – Quality circle – TQM

Pollution control – Polluting agents – E-Waste management - Recycling of water – Recovery techniques – Air pollution – Environmental standards – Safety precautions for the personnel.

REFERENCE:

- Ebook for production and operation management – www.todaylibrary.com
- Production and Operation management – S.Anil Kumar & N.Suresh – New Age International Publication.
- PCB design , Fabrication, Assembly & Testing – Dr. Khandpur- Tata Mc Graw Hill

PROFESSIONAL ETHICS AND HUMAN VALUES

Course code	18KUG6EL4	Credits	4	Year	III
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	VI

Unit I: Business Ethics

Conceptual approach – Emerging issues – Importance of Ethics – Understanding Ethics – Ethical decision making – Moral problem

Unit II: Managing Ethical Organization

Elements of ethical organization – Manager's role in influencing ethical climate - Codes of ethics – Codes of Contact – Ethical leadership – Ethical organization

Unit III: Business ethics in Profession

Ethical concern in Human Resource Management (HRM) – Ethical issue in marketing and advertising – Marketing ethics – Ethics in production management – work ethics

Unit IV: Corporate Governance and social responsibility:

Corporate Governance – Company management – Factors for success – Social responsibility towards stakeholders – Social responsibility of business

Unit V: Human Values

Wisdom Management – A person of character – Knowledge Management – Understanding success – Stress management

Text Book:

Business Ethics and Global Values by S.K Bhatia, Deep & Deep Publication Pvt. Ltd., New Delhi

SAFETY ENGINEERING

Course code	18KUG6EL5	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	VI

Unit-I Introduction

Evolution of modern safety concept- Safety policy - Safety Organization - line and staff functions for safety- Safety Committee- budgeting for safety - Risk assessment & management - Safety Education and training- Importance, various training methods – First Aid, Resuscitation, Bleeding, management of shock, Burns, scalds and accidents caused by electricity, Rescue and transport of casualty Role of management and role of Govt. in industrial safety, safety analysis.

Unit-II Safety prevention

Definitions and theories, Accident, Injury, unsafe condition, Dangerous occurrence- Cost of accidents- Accident prevention- Safety performance - Personal protective equipment- survey the plant for locations and hazards, part of body to be protected - Economic importance of accidents, Analysis of accident records, accident investigations.

Unit-III Safety in Material Handling

General safety rules, principles, maintenance, Inspections of turning machines, boring machines, milling machine, planning machine and grinding machines, CNC machines, electrical guards, work area, material handling, inspection - Heat treatment operations, paint shops, sand and shot blasting, safety in inspection and testing, pressure vessels, air leak test, steam testing, safety in radiography, personal monitoring devices, radiation hazards.

Unit-IV Shopfloor Safety

Automotive vehicle design, selection, operation and maintenance of motor vehicle - Basic automotive road Signals, Symbols, Rules and Regulation - safety on manual, mechanical handling equipment operations - Servicing and maintenance equipment grease rack operation wash rack operation - battery charging - gasoline handling - other safe practices - preventive maintenance - check lists - motor vehicle insurance and surveys.

Unit-V Electrical Safety

General principles of electric safety - Preventive maintenance - Electricity & Human body - Earthing / Grounding - Safety against over voltage, extra-low and residual voltages - Hazardous areas, Electrical insulation - Energy leakage - Electrical fires and Arc flash - Electrical causes of fire and explosion - National electrical Safety code - Safety in the use of portable tools.

Text Books:

1. C.Ray Asfahl , *Industrial Safety and Health management,* Pearson Prentice Hall,2003.
2. N.V Krishnan. *Safety Management in Industry* Jaico Publishing House, Bombay, 1997.

ENTREPRENEURSHIP DEVELOPMENT

Course code	18KUG6EL6	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	VI

Unit I: Entrepreneurship

Meaning, Definition, Characteristics and Functions-Role of Entrepreneur in economic development -Types-Qualities of an Entrepreneurs - Classification of Entrepreneurs-Factors Influencing Entrepreneurship – Entrepreneurship development programme – Self Employment schemes – Government policies on Entrepreneurial development.

Unit II: Institutional Finance to Entrepreneurs

State Level Financial Institutions: State Financial Corporation (SFCS) - State Industrial Development Corporation (SIDCS) – Tamilnadu Industrial Investment Corporation (TIIC) - Small Industries Promotion Corporation of Tamilnadu (SIPCOT).

All Indian Financial Institutions:

Industrial Development Bank of India (IDBI) – Industrial Finance Corporation of India (IFCI) – Industrial Credit Investment Corporation of India (ICICI) – Industrial Rural Development Bank of India (IRDBI).

Unit III: Institutional Setup to Entrepreneurs

District Industries Centre (DIC) – National Small Industries Corporation (NSIC) – Small Industries Development Corporation (SIDC) – Small Industries Service Institute (SISI) – Indian Investment Centre – Kadhi and Village Industries (KVIC).

Unit IV: Incentives and Subsidies of State and Central Government

Subsidy For Market – Capital Assistance - Subsidized Services – Taxations, Benefits to SSI – Transport Subsidy – Seed Capital Assistance – Special Facilities for imports.

Unit V: Sources of Ideas

Preliminary Evaluation and Testing of ideas – Demand based industries and Resource based industries - Project Formulation - Project Identification-Evaluation-Feasibility Analysis-Project Report.

Text Books:

1. Radha V, Entrepreneurship Development, Prasanna Publication House, 2008.
2. Khaka SS, Entrepreneurship Development, S. Chand & Co. Ltd. 2010.
3. Vasant Desai. The Dynamics of Entrepreneurship Development and Management.
4. Gupta C. B, Srinivasan N.P. Entrepreneurship Development, S. Chand & Co. Ltd. 2011.

MICROPROCESSOR AND MICROCONTROLLER LAB

Course code	18KUTE6P3	Credits	04	Year	III
No. of Lecture Hours	--	No. of Practical Hours	120	Sem	VI

8085 MICROPROCESSOR

Write an Assembly Language Program to

1. Add two 8 bit numbers using 8085 Microprocessor.
2. Subtract two 8 bit numbers using 8085 Microprocessor
3. Multiply two 8 bit numbers using 8085 Microprocessor
4. Divide two 8 bit numbers using 8085 Microprocessor.

8051 MICROCONTROLLER

Write an Assembly Language Program to

1. Addition and Subtraction of two 8 bit numbers using 8051 Microcontroller.
2. Multiplication and Division of two 8 bit numbers using 8051 Microcontroller.
3. Arranging the given data in ascending order.
4. Square Root of a given number.
5. Solve the given Boolean Equation.

INTERFACING PROGRAMS

1. Interfacing the 4*4 Key MATRIX with 8279
2. Interfacing push to on switches and relays with 89C51.
3. Interfacing the two Digit Seven segments LED with 8051.
4. Interfacing ADC 0808 with 89C51.
5. Interfacing of the given DC Motor with Microcontroller.
6. Interfacing of stepper Motor with Microcontroller.

PROJECT

Course code	18KUTE6PR	Credits	04	Year	III
No. of Lecture Hours	--	No. of Practical Hours	120	Sem	VI

OBJECTIVES:

- To develop Electronic Hardware working model suitable for real practical environment.
- To develop production plan

OUTCOMES:

- Develop Electronic Hardware working model suitable for real practical environment.
- Develop the production plan

Develop Electronic Hardware working model suitable for real practical environment by implementing the theoretical and practical knowledge gained through the curriculum.

Develop the production plan by considering the following parameters

a) Material Requirement

b) Analyze the specification and quantity of required Electronic components

c) Cost estimation.

d) Time and resource required for completing a product

e) Man power planning

f) Maintain proper documents and reports wherever required

INTERNSHIP TRAINING-III

Course code	18KUTE6I3	Credits	20	Year	III
No. of Lecture Hours	--	No. of Practical Hours	1200	Sem	VI

OBJECTIVES:

- To Understand the work requirement
- To Understand the customer and market requirement
- To Develop product
- To Report and document completion of work
- To Follow quality procedures

OUTCOMES:

- Students will able develop the product plan by analysing the customer need
- Students will able to lead the team and allocate the work schedule
- Students will gain self confidence and they will be able to co-ordinate with others

Students should undergo internship training in an esteemed Electrical and Electronic concern to gain hands on practice and practical industrial exposure.

Students are expected to submit their daily work report at the time of examination.

SCHEME OF EXAMINATION
(for General Education and Vocational Education Component)

General Rule of Examination:

Every student should earn a minimum attendance of 75% to become eligible to appear for Semester Examinations.

To pass in an examination, a student has to score a minimum of 40% marks in each theory & practical paper (Internal and External combined but with a minimum of 40% marks in internal and external).

Evaluation of student's performance for the theory, practical and Internship Training part includes two components.

Components	Internal Marks	External Marks	Total Marks
General and Vocational Component (Theory)	50	50	100
Vocational Component (Practical)	50	50	100
Vocational Component (Internship Training)	100	300	400

Continuous Internal Assessment:

Two CIA tests conducted for each paper during each semester.

CIA for General and Vocational component (Theory):

S.No	Type	Units	Max. Marks
1.	CIA test – I	1 & 2	**20 Marks**
2.	CIA test – II	3, 4 & 5	**25 Marks**
Total			**45 Marks**

Internal Marks (Theory):

Internal Marks- Break up (50 Marks)		
A	CIA – I & CIA – II test (45 marks converted to 30 Marks)	**30 Marks**
B	Percentage of Attendance 95% - and above - 10 Marks 90% - 94% - 8 Marks 85% - 89% - 6 Marks 81% - 84% - 4 Marks 75% - 80% - 2 Marks	**10 Marks**
C	Marks for Assignment / Seminar	**10 Marks**
Total		**50 Marks**

Internal Marks (Practical):

Internal Marks- Break up (100 Marks)		
A	Model practical Examination	**50 Marks**
B	Percentage of Attendance 95% - and above - 10 Marks 90% - 94% - 8 Marks 85% - 89% - 6 Marks 81% - 84% - 4 Marks 75% - 80% - 2 Marks	**10 Marks**
C	Record Note	**20 Marks**
D	Overall performance in the class	**20 Marks**
Total		**100 Marks**

Total 100 marks will be converted to 50 marks and the same will be awarded as an internal mark for practical.

Internal Marks (Internship Training):

Internal Marks- Break up (100 Marks)		
A	Model Examination	**50 Marks**
B	Internship Report Note	**50 Marks**
Total		**100 Marks**

QUESTION PAPER PATTERN

1) The question paper pattern and coverage of syllabus for each CIA and External (semester) examinations for all General and vocational component subjects except Environmental Studies.

CIA TEST – I
(Unit 1 & 2 only)

Time: 1 Hour **Max. Marks: 20**

Part - A	**No choice** (Five questions from unit 1 & 2)	**5 x 2 = 10**
Part – B	**Two out of three** (Three questions from unit 1 & 2)	**2 x 5 = 10**

CIA TEST – II
(Unit 3, 4 & 5 only)

Time: 1½ Hour **Max. Marks: 25**

Part - A	**No choice** (Five questions from unit 3, 4 & 5)	**5 x 2 = 10**
Part – B	**Answer any Three questions out of Five** (Five questions from unit 3, 4 & 5)	**3 x 5 = 15**

SEMESTER EXAMINATION
(All Five Units)

Time: 2 Hours **Max. Marks: 50**

Part - A	**No Choice** (Ten questions from All five units)	**10 x 2 = 20**
Part – B	**Answer any Five questions out of Eight** (Eight questions from All five units)	**5 x 6 = 30**

2) Both internal Assessment and Semester Examination **for Environmental Studies (III semester- General Component)** will be conducted through online exam.