



**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)**  
**Production Technology ( Tool & Die)**  
( An UGC sponsored DDU-KAUSHAL KENDRA Programme )

## **SYLLABUS**

**(ACADEMIC YEAR 2016-2017 Onwards)**

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

For Students admitted from 2016-2017& onwards

**COURSE OF STUDY**

- Syllabus is framed for B.VOC (Production Technology Tool &Die) 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.

**CURRICULUM OUTLINE**

**SEMESTER - I**

Course code	Part	Name of the Subject	Lecture / Practical Hrs		Duration of Exam in Hours	Marks		Total Marks	Credits
			Lecture	Practical / Field Work		Internal	External		
<b>GENERAL EDUCATION COMPONENT</b>									
16KUG E101	II	Basic English	60	-	2	50	50	100	4
16KUG E102	III	Allied I: Mathematics- I	60	-	2	50	50	100	4
16KUG 1ENS	IV	Environmental studies	60	-	2	50	50	100	4
<b>Sub Total (A)</b>			<b>180</b>	<b>-</b>	<b>06</b>	<b>150</b>	<b>150</b>	<b>300</b>	<b>12</b>
<b>VOCATIONAL EDUCATION COMPONENT</b>									
16KUP T101	III	Core I: Planning and Fitting	60	-	2	50	50	100	4
16KUP T102	III	Core II: Lathe	60	-	2	50	50	100	4
<b>Sub Total (B)</b>			<b>120</b>	<b>0</b>	<b>04</b>	<b>100</b>	<b>100</b>	<b>200</b>	<b>08</b>
<b>Total (A +B)</b>			<b>300</b>	<b>0</b>	<b>10</b>	<b>250</b>	<b>250</b>	<b>500</b>	<b>20</b>

**T-Theory**

**P-Practical**

## SEMESTER - II

Course code	Part	Name of the Subject	Lecture / Practical Hrs		Duration of Exam in Hours	Marks		Total Marks	Credits
			Lecture	Practical / Field Work		Internal	External		
<b>GENERAL EDUCATION COMPONENT</b>									
16KUG E203	III	Allied II: Office Automation	60	-	2	50	50	100	4
16KUG E204	II	Professional English	60	-	2	50	50	100	4
16KUG 2VAL	IV	Value Education	60	-	2	50	50	100	4
<b>Sub Total (A)</b>			<b>180</b>	<b>-</b>	<b>06</b>	<b>150</b>	<b>150</b>	<b>300</b>	<b>12</b>
<b>VOCATIONAL EDUCATION COMPONENT</b>									
16KUP T203	III	Core III: Special Machines	60	-	2	50	50	100	4
16KUP T2P1	III	Practical I: Fitting and Lathe	-	60	3	50	50	100	2
16KUP T2P2	III	Practical II: Special Machines	-	60	3	50	50	100	2
16KUP T2I1	III	Internship Training-I	-	1400	3	100	300	400	20
<b>Sub Total (B)</b>			<b>60</b>	<b>1520</b>	<b>11</b>	<b>250</b>	<b>450</b>	<b>700</b>	<b>28</b>
<b>Total (A +B)</b>			<b>240</b>	<b>1520</b>	<b>17</b>	<b>400</b>	<b>600</b>	<b>1000</b>	<b>40</b>

**T-Theory**

**P-Practical**

## SEMESTER - III

Course code	part	Name of the Subject	Lecture / Practical Hrs		Duration of Exam in Hours	Marks		Total Marks	Credits
			Lecture	Practical / Field Work		Internal	External		
<b>GENERAL EDUCATION COMPONENT</b>									
16KUG E305	II	Technical Communication	60	-	2	50	50	100	4
16KUG E306	III	Allied III: Mathematics-II	60	-	2	50	50	100	4
16KUG E307	III	Elective I: Principles of management	60	-	2	50	50	100	4
<b>Sub Total (A)</b>			<b>180</b>	<b>-</b>	<b>06</b>	<b>150</b>	<b>150</b>	<b>300</b>	<b>12</b>
<b>VOCATIONAL EDUCATION COMPONENT</b>									
16KUPT 304	III	Core IV: CNC Machines & EDM	75	-	2	50	50	100	5
<b>Sub Total (B)</b>			<b>75</b>	<b>-</b>	<b>02</b>	<b>50</b>	<b>50</b>	<b>100</b>	<b>05</b>
<b>Total (A +B)</b>			<b>255</b>	<b>-</b>	<b>08</b>	<b>200</b>	<b>200</b>	<b>500</b>	<b>17</b>

**T-Theory**

**P-Practical**

## SEMESTER - IV

Course code	Part	Name of the Subject	Lecture / Practical Hrs		Duration of Exam in Hours	Marks		Total Marks	Credits
			Lecture	Practical / Field Work		Internal	External		
<b>GENERAL EDUCATION COMPONENT</b>									
16KU GE408	III	Allied IV: Technical Drawing	60	-	2	50	50	100	4
16KU GE409	III	Elective II: Professional Ethics and Human Values	60	-	2	50	50	100	4
16KU GE410	III	Elective III: Indian Values	60	-	2	50	50	100	4
<b>Sub Total (A)</b>			<b>180</b>	<b>-</b>	<b>06</b>	<b>150</b>	<b>150</b>	<b>300</b>	<b>12</b>
<b>VOCATIONAL EDUCATION COMPONENT</b>									
16KU PT405	III	Core V: Drafting and Plotting	75	-	2	50	50	100	5
16KUP T4P3	III	Practical III: CNC and EDM	-	90	3	50	50	100	3
16KUP T4P4	III	Practical IV: Drafting and Plotting	-	90	2	50	50	100	3
16KUP T4I2	III	Internship Training-II	-	1400	3	100	300	400	20
<b>Sub Total (B)</b>			<b>120</b>	<b>1580</b>	<b>10</b>	<b>250</b>	<b>450</b>	<b>700</b>	<b>31</b>
<b>Total (A +B)</b>			<b>300</b>	<b>1580</b>	<b>16</b>	<b>400</b>	<b>600</b>	<b>1000</b>	<b>43</b>

**T-Theory**

**P-Practical**

## SEMESTER - V

Course code	Part	Name of the Subject	Lecture / Practical Hrs		Duration of Exam in Hours	Marks		Total Marks	Credits
			Lecture	Practical / Field Work		Internal	External		
<b>GENERAL EDUCATION COMPONENT</b>									
16KUG E511	I	Tamil I	60	-	2	50	50	100	4
16KUG E512	III	Allied V: Mathematics -III	60	-	2	50	50	100	4
16KUG E513	II	Elective IV: Total Quality Management	60	-	2	50	50	100	4
<b>Sub Total (A)</b>			<b>180</b>	<b>-</b>	<b>06</b>	<b>150</b>	<b>150</b>	<b>300</b>	<b>12</b>
<b>VOCATIONAL EDUCATION COMPONENT</b>									
16KUP T506	III	Core VI: Design of Jigs and Fixtures	75	-	2	50	50	100	5
16KUP T5P5	III	Practical V: Design and Manufacturing	-	90	3	50	50	100	3
<b>Sub Total (B)</b>			<b>75</b>	<b>90</b>	<b>05</b>	<b>100</b>	<b>100</b>	<b>200</b>	<b>08</b>
<b>Total (A +B)</b>			<b>155</b>	<b>90</b>	<b>11</b>	<b>250</b>	<b>250</b>	<b>500</b>	<b>20</b>

**T-Theory**

**P-Practical**

## SEMESTER - VI

Course code	Part	Name of the Subject	Lecture / Practical Hrs		Duration of Exam in Hours	Marks		Total Marks	Credits
			Lecture	Practical / Field Work		Internal /Theory	External/ Practical		
<b>GENERAL EDUCATION COMPONENT</b>									
16KU GE614	I	Tamil II	60	-	2	50	50	100	4
16KU GE615	III	Elective V: Safety Engineering	60	-	2	50	50	100	4
16KU GE616	III	Elective VI: Entrepreneurship Development	60	-	2	50	50	100	4
<b>Sub Total (A)</b>			<b>180</b>	<b>-</b>	<b>06</b>	<b>150</b>	<b>150</b>	<b>300</b>	<b>12</b>
<b>VOCATIONAL EDUCATION COMPONENT</b>									
16KUP T6PR		Project	-	120	3	50	50	100	8
16KUP T6I3		Internship Training-III	-	1400	3	100	300	400	20
<b>Sub Total (B)</b>			<b>-</b>	<b>1520</b>	<b>06</b>	<b>150</b>	<b>350</b>	<b>500</b>	<b>24</b>
<b>Total (A +B)</b>			<b>180</b>	<b>1520</b>	<b>12</b>	<b>300</b>	<b>500</b>	<b>800</b>	<b>36</b>

**T-Theory**

**P-Practical**



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

## BASIC ENGLISH

Course code	16KUGE101	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

### OBJECTIVES:

- To enable the student to understand the main aspects of English grammar.
- To make him speak and write correct English without any grammatical error.
- To make him acquire the language skills (Listening, Speaking, Reading and Writing) in English.

### OUTCOMES:

- Student will be able to overcome his mother tongue influence gradually.
- The course will enable him to clear all the competitive exams successfully.

### 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	16KUGE102	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

### OBJECTIVES:

The main objectives for framing the syllabus of Mathematics for the B.Voc degree is to enhance the **fundamental knowledge of the students in basic Mathematics** such as

- Set theory
- Sequence and series
- Algebraic equations
- Matrices
- Co-ordinate geometry
- To **solve the problems arise in engineering.**

### UNIT - I

**Set and Functions:** Introduction - Properties of operations on sets - De Morgan's laws - verification examples - Venn diagrams - formula for  $n(A \cup B \cup C)$  - 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:** Introduction - Types of Matrices - Addition and subtraction - Multiplication - Matrix equation.

### UNIT - V

**Coordinate Geometry:** Introduction - Distance between two points - Section formula, midpoint formula, Centroid formula - Area of triangle and quadrilateral - straight line.

### Text Books:

Basic Mathematics, Science Series Rupa, Rupa Publications

## ENVIRONMENTAL STUDIES

Course code	16KUGIENS	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

### OBJECTIVES:

1. To create the awareness among students regarding Environment.
2. To understand the causes of pollution and prevention methods

### 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, man/wildlife conflicts.-Endangered and endemic species of India-Conservation 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.

## PLANNING AND FITTING

Course code	16KUPT101	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

### UNIT - I

Working safety - Health and safety - environmental and operating conditions - Safety considerations - Personal protective equipment (PPE) - Safety regulations - Tools and equipments - Hand tools - Machine tools - Inspection.

### UNIT - II

Obtaining and understanding drawings - Tools and dies - Engineering information - Company procedures - Analyze design drawings - Knowledge of available resources - Sequencing / Process planning - Reporting - Specifications - Computing - Production planning

### UNIT - III

**Various operations** - Tool selection - Material selection - Tool life - Factors affecting tool life - Types of equipments - Time estimation - Sequence analysis - Milestones - Approval - Responsibility - Allocation of responsibility - ensure and inspect - Release drawings, machining specifications, process planning, production planning to operators - Selection of tools - Selection of equipments - Selection of materials.

### UNIT - IV

**Fitting** - Types of fitting - Procedures and instructions - Fitting tools - Equipments - Job specification - Requirements - Reporting - Preparation of work area - Measuring instruments - Calibration - Selection of raw materials - Inspection - Selection of tools and equipments - Work holding devices - Supporting mechanisms - Marking - Templates - Transfer / Trace - Hand tools and manually operated machine tools for fitting - Assembling - Inspection.

### UNIT - V

**Quality - Measurement** - Types of measurement - Visual inspection - Standards - Target - Risk of failure - Conditions - Reporting - Time estimation - Production target and specifications - Inspect and check - Documentation.

**Equipments - Types - Error - Calibration** - Tool components - Tool clamping - Various operations - Drilling, Reaming, Boring, Tapping - Assembling equipments - Fasteners - Adhesives - Soldering - Brazing - Dismantling and assembling - Problem solving - Tool and die - Measure - Inspect - Procedure.

## LATHE

Course code	16KUPT102	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

### UNIT - I

Working safety - Environmental conditions - Operating conditions - Personal protective equipment ( PPE ) - Procedures and guidelines - Health and safety - Safety regulations - Safety instructions.

### UNIT - II

Measuring instruments - Types - Error - Calibration - Range - Selection - Materials - Types - Selection - Requirements - Specification - Raw materials - Work area - Process planning.

### UNIT - III

Turning - Turning tools - Selection - Types - Properties - Tool materials - Safe working practices - Machine inspection - Work holding devices - types - Tool holding devices.

### UNIT -IV

Turning machine - Types - Main parts - Specification - Turret and capstan lathe - Turret indexing mechanism - Driving mechanisms - Various operations - Various attachments - Taper turning - Various methods - Thread cutting - Special attachments - Speed - Feed - Depth of cut.

### UNIT - V

Mounting of tools - Work piece - Operating procedures - Modes of control - Usage of Lathe parts - Various methods in clamping work piece - Various equipments used - Backlash - Effects of backlash - Accuracy - Dimensional accuracy - Tool life - Factors affecting tool life - Cutting fluids - Types - Properties - Selection - In-process inspection - Quality control procedures.

## OFFICE AUTOMATION

Course code	16KUGE203	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	II

### OBJECTIVES:

1. To develop the basic computer operating skill of the student
2. To enable the students to create and maintain their records in computer.
3. To create the knowledge for accessing Internet.

### 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.

## PROFESSIONAL ENGLISH

Course code	16KUGE204	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical	--	Sem	II

### OBJECTIVES:

- Preparing the student to be **competent in verbal and non-verbal communicative skills.**
- To enable him to overcome his all linguistic barriers systematically.
- To acquire the desirable proficiency in English language.

### OUTCOMES:

- **Enhanced to achieve good communication skills.**
- Enable to face interviews successfully.

### 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.



## விழுமியக் கல்வி (VALUE EDUCATION)

Course code	16KUG2VAL	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	II

### அலகு- I

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

### அலகு- II

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

### அலகு - III

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

### அலகு -IV

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

### அலகு - V

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

குறிப்பு தயாரிக்கப்பட்ட பாடஉரை அளிக்கப்படும்

## SPECIAL MACHINES

Course code	16KUPT203	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	II

### UNIT : I

**Milling** - Types of milling - Milling machine - Types - Constructional features - Main parts - Working principle - Inspection of machine - Training - Safety - Tools and equipments - Cutters - Types - Work holding devices - Cutter holding devices - Flexibility of machine - Component drawings - Specifications - Extraction - Various milling machines - Various operations - Hand mode - Power mode - Emerging situations - Safety.

### UNIT : II

**Measurements - System of measurement** - Imperial system - Metric system - Quality standards - Production targets - Backlash - Tool life - Surface finish - Accuracy - Cutting fluids - Properties - Types - Quality control procedures - Inspecting equipments - Inspection - Hazards - Equipments - Working tools - Measurements - Measuring instruments - Calibration - Least count - Error - Types - Work holding devices - Clamping - Material selection - Equipment selection.

### UNIT : III

**Grinding** - Types - Grinding machine - Types - Constructional features - Working principle - Grinding wheel - Designation - Preparation - Abrasives and types - Bonding - Materials - Preparation - Types - Various operations - Mounting of grinding wheels - Steps in mounting - Safety considerations - Speed - Feed - Depth of cut - Surface finish - Factors affecting - Coolants - Types - Properties - Selection - Measurement - Measuring instruments - Calibration - Inspection.

### UNIT - IV

**Work holding devices** - Selection - Set - Mark - Prepare the work - Selection of tool - Stone - Wheel - File - Abrasives - Specification of grinding wheel - Factors considered for selection - Bond - Types - Wheel types - Cut-off discs (Diamond blade) - Abrasive grinding discs - Grinding stones - Wire brush wheels.

### UNIT : V

**Control setting - Work handling - Grinding machine - Types - Angle grinders - Bench grinders - Straight grinders - Rotary die grinders** - Disc grinder - Electronic grinder - Electric grinder - Hydraulic grinder - Pneumatic grinder - Pedestal grinder - Cylindrical grinder - Inspection - Surface finish - Geometric dimensions - Dressing and truing of wheels - Cutter - Diamond cutter - Common surface imperfections - Errors - Texture - Roughness - Secure tools and equipments - Repairing - Maintenance - Types - Documentation - Job card - Progress reports - Incident reports - Support - Monitor.

## PRACTICAL: FITTING AND LATHE

Course code	16KUPT2P1	Credits	02	Year	I
No. of Lecture Hours	--	No. of Practical Hours	60	Sem	II

### **FITTING:**

1. Square filing
2. Profile cutting
3. T - Matting
4. V - Matting
5. Slide fit assembly
6. Drilling, Tapping and fitting

### **LATHE:**

- 1) Study of Lathe and its main parts
- 2) Facing
- 3) Straight turning
- 4) Step turning
- 5) Chamfering
- 6) Taper turning
- 7) Drilling and Boring
- 8) Thread cutting
- 9) Knurling

## PRACTICAL: SPECIAL MACHINES

Course code	16KUPT2P2	Credits	02	Year	I
No. of Lecture Hours	--	No. of Practical Hours	60	Sem	II

1. Six side milling
2. Step milling
3. Groove milling
4. Gear Cutting
5. Surface Grinding
6. Cylindrical Grinding
7. PCD Drilling

## INTERNSHIP TRAINING-I

Course code	16KUPT2I1	Credits	20	Year	I
No. of Lecture Hours	--	No. of Practical Hours	1400	Sem	II

### OBJECTIVES:

- 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.

Students should undergo internship training in an esteemed Tool and Die making 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	16KUGE305	Credits	4	Year	II
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	III

### OBJECTIVES:

- To enable the student to understand the main aspects of English grammar.
- To make him speak and write correct English without any grammatical error.
- To make him **acquire the language skills** (Listening, Speaking, Reading and Writing) in English.

### OUTCOMES:

- Student will be able to overcome his mother tongue influence gradually.
- The course will enable him to clear all the competitive exams successfully.

### 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 14<sup>th</sup> ed, 2008
- 3) Effective English Grammar and Composition- V.Syamala, Emerald Publication.

## MATHEMATICS - II

Course code	16KUGE306	Credits	4	Year	II
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	III

### Objectives:

To gain the basic knowledge about the Interest rate, solution of linear equations, differential and integral calculus and Operational research

### Unit I:

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

### Unit II:

Matrix: Inverse of a matrix - Rank of a matrix - Solution of simultaneous linear equations

### Unit III:

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

### Unit IV:

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

### Unit V:

Linear programming problem - Formation - Solution by Graphical method

### Text Book:

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

## PRINCIPLES OF MANAGEMENT

Course code	16KUGE307	Credits	4	Year	II
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	III

### OBJECTIVES:

To enable the students to study the evolution of Management, to study the functions and principles of management and to learn the application of the principles in an organization.

### UNIT I: INTRODUCTION TO MANAGEMENT AND ORGANIZATIONS

Definition of Management - Science or Art - Manager Vs Entrepreneur - types of managers - 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 - Organization culture and Environment - Current trends and issues in Management.

### UNITII: PLANNING

Nature and purpose of planning - planning process - types of planning - objectives - setting objectives - policies - Planning premises - Strategic Management - Planning Tools and Techniques - **Decision making steps and process.**

### UNIT III: ORGANISING

Nature and purpose - Formal and informal organization - organization chart - organization structure - types - Line and staff authority - departmentalization - delegation of authority - centralization and decentralization - Job Design - Human Resource Management - HR Planning, Recruitment, selection, Training and Development, Performance Management, **Career planning and management.**

### UNIT IV: DIRECTING

Foundations of individual and group behavior - 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** - control and performance - 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.



## CNC MACHINES AND EDM

Course code	16KUPT304	Credits	05	Year	II
No. of Lecture Hours	75	No. of Practical Hours	--	Sem	III

### Unit-I

Working Safety – Personal Protective equipment – Hand tools – Cutting tools - Cutting tools materials – Measuring equipments. Preparing for machining activities on Turning Center – Valid sources – Job Specification documents- Job requirements.

Information pertaining to tapping sizes and thread, feed and speeds, machining symbol and tolerance – Preliminary check – Cutting tools- reference charts – Tables and Graphs – Preliminary check – Description of Turning machine specification.

**Critical Parameters- Tooling data** – Features of machined components produced work holding device and fixtures- Basic maintenance activities – features and profiles – Symbols used in program – Address characters function – G codes and M codes- identify different parts of the CNC turning machine -perform various turning operations to produce various features on metal and non-metal components.

### Unit-II

**Turning operations** : straight turning, taper turning, facing, grooving, parting off, thread cutting, drilling, reaming, boring, etc.,

**Milling operations:** e.g. milling of flat surfaces; gang and straddle milling; milling of sunk and recessed surfaces, face milling, side milling, angular milling, slotting, slitting, key way cutting, face slot cutting, woodruff cutting, dovetail cutting, etc.

**CNC machines – 2 axis CNC m/c – 3 axis m/c centre (VMC,HMC)** terms in programming – Checks – CNC Programming operation – Preparing, Loading, storing in appropriate format providing part program, trial runs – Simulation [Command and format] – Reference position – Cutter radius offset – Tool length offset] – Cutter compensation function.

### Unit-III

**Engineering drawing-Dimensioning and labeling** – Projection – Isometric Projection Part – Programme for relative work – Tool movement of a CNC m/c tool – Co-ordinate positioning (Absolute, Incremental), use of sub routines, macros and canned cycles- Cad/Cam CNC Program –Tool material design.

Tooling and work holding devices – Carry out setting for CNC turning center – Set up of machine – Perform the necessary checks before allowing the machine to operation in full program run mode – Checks – Measure all dimension as per specification – Basic maintenance activities.

### Unit-III

**Introduction to Unconventional machining processes** – Types of Unconventional machining processes – Measuring equipments. Preparing for machining activities –

Valid sources - Job Specification documents- Job requirements. EDM-Spark erosion- Preliminary check e.g. Machine condition, position and alignment of work piece, lubricating systems, coolant level-sub-systems working condition, etc.,-Accuracy standards-free from damage-false tool cuts-burrs-scratches and non-specified sharp edges-general dimensional tolerance +/- 0.02mm-flatness and squareness 0.05mm-angles within +/-1 degree-setting of machine to achieve target

#### **Unit-IV**

**Measuring and machining tools**-Positioning and holding devices-Mechanical properties of metals-Features of finished components-Dimensional parameters-Accuracy parameters. Preparation of EDM for production-mount and setting of work holding devices-cutting tools-positioning of work piece-selecting and mounting of electrodes-setting machine tool operating parameters. Specification of EDM-electrical conditions-alignment of electrodes-filtration equipment-liner feeds and speeds-dielectric flow rates-ventilation and fume extraction-safety mechanisms/devices-maximum weight carrying capacity

#### **Unit-V**

**Range of materials** : ferrous e.g. low, medium and high carbon steels, low alloy steels, stainless steels, cast iron- nonferrous e.g Aluminium and its alloys, bronze, silicon carbide-Trial run-adjustment of parameters-positioning-hand over-instructions and documentation-completion of documentation-Switching on/off EDM-returning tools, equipments and instruments to store-changing of cutting tools-Documentation : job card-progress records-incident reports-problem solving-guidance-leaving work area.

## TECHNICAL DRAWING

Course code	16KUGE408	Credits	4	Year	II
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	IV

### Objectives:

At the end of the semester the student must be able to draw

- 2D diagrams using Auto CAD
- Symbols widely used in Electrical and Electronics circuits

### Unit I- 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.

### Unit II -Text and Dimensioning

Auto CAD importance, Auto CAD Tools, Drafting and Unit settings, Auto CAD commands, Types of Lines and Layers -Simple Sketches (lines and curves)  
Single text and multi text- Basic dimensioning - editing dimensions - dimensions styles - dimensioning systems variables.

### Unit III - Geometrical construction

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

### Unit IV-Projections

**Orthographic** (first angle and third angle) (10 simple exercises each) - **Isometric** (5 simple exercises)- (Different types of machine parts- 2D and 3D wire frame models- Solid figures) - Oblique (2D and 3D wire frame models) (3 simple exercises) - Blue print reading (Missing views - Missing Lines - Missing dimensions)

### Unit V -Electrical and Electronics Symbols

Draw 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.

Draw symbols of Resistors - inductors - capacitors - diodes - transistors - FET - SCR - UJT  
- DIAC - TRIAC - MOSFET'S - LOGIC GATES - AND - OR - NOT - NAND - NOR - EXOR

**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, 2<sup>nd</sup> edition, 2009.

## PROFESSIONAL ETHICS AND HUMAN VALUES

Course code	16KUGE409	Credits	4	Year	II
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	IV

### Objectives:

- Understand what morality is and how it connects to professional ethics
- Understand the features of moral reasoning, moral explanations and the role of moral theories
- Develop a case resolution model for resolving moral dilemmas faced by professionals

### 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

## INDIAN VALUES

Course code	16KUGE410	Credits	4	Year	II
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	IV

### Objective:

- To create an awareness of values promoted in the cultural and spiritual heritage of India and to impart means to inculcate these values for one's personal growth and national development.

### 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

## DRAFTING AND PLOTTING

Course code	16KUPT405	Credits	05	Year	II
No. of Lecture Hours	75	No. of Practical Hours	--	Sem	IV

### Unit I

#### Basics of CAD

**Intro of CAD** - CAD Workspaces - Using The Application Menu, Ribbon And The QAT-Command Line, Dynamic Input And Auto Complete- Toolbars, File Tabs And The Menubar-Pallets And Short Cut Menus-Using Function Keys And Command Aliases- The Status Bar-An Introduction To Model Space And Paper Space- Quick Access the Drawings

### Unit II

#### Fundamental Operations

**Start and Quitting CAD-Object Selection Methods, Undo Command- Working With Specific Units**- Working With The Coordinate System- Using The Grid System With The Snap Feature- Pan , Zoom, Osnap,Ortho and Grips- Project related to until this Chapter

### Unit III

#### Drawing And Drafting Tools

**Lines, Polylines And Their Uses**-Arcs, Circles and its types-Points And Their Styles- Polygons , Rectangles And Ellipses- Methods To Create Precise Objects- Project related to until this Chapter

#### Editing and Transforming Tools

Trim And Extend Lines- Delete, Trim And Extend Lines- The Move And Copy Commands-Stretching, Rotating and Scaling Objects- Offset and Mirror- Fillet And Chamfer- Types of Arrays and Object Properties- Project related to until this Chapter

### Unit IV

#### Using Layers

**Creating And Editing Layers**- Layer Properties and Manager- Freeze, Thaw, On, Off, And Lock

#### Annotations

Dimensions and its Styles- Dimensioning Tools And Settings- Multileaders- Single and Multiline Text- Text Styles and Tables- Chapter Project

## **Unit V**

### **Blocks**

**Intro about Blocks and its uses**- Creating Blocks and Editing Blocks- Inserting Blocks And Using Them- Attributed and Dynamic Blocks- The Effect Of Exploding Blocks- Chapter Project

### **Plot And Publish**

The Difference between Model Space And Paper Space-Viewports , Page Setup and Plotting-Export Your File



## PRACTICAL: CNC AND EDM

Course code	16KUPT4P3	Credits	03	Year	II
No. of Lecture Hours	--	No. of Practical Hours	90	Sem	IV

### **CNC MACHINES:**

1. Plain turning and facing
2. Step turning
3. Thread cutting
4. Turning and facing cycles
5. Face milling
6. Drilling and Boring
7. Profile milling

### **EDM:**

1. Study of EDM Machines
2. Setting of Work in EDM
3. Profile cutting in EDM

## PRACTICAL: DRAFTING AND PLOTTING

Course code	16KUPT4P4	Credits	03	Year	II
No. of Lecture Hours	--	No. of Practical Hours	90	Sem	IV

1. Introduction to Auto Cad
2. Tool bars and Menu bars
3. Create simple Engineering drawings (Ellipse, Parabola, Hyperbola, Cycloid, Involute)
4. Create simple mechanical designs

## INTERNSHIP TRAINING-II

Course code	16KUPT4I2	Credits	20	Year	II
No. of Lecture Hours	--	No. of Practical Hours	1400	Sem	IV

### OBJECTIVES:

- To obtain hands on training of CNC machines and EDM.
- To Coordinate with the design team
- To develop a good relationship with their co-workers

Students should undergo internship training in an esteemed Tool and Die making concern to gain hands on practice and practical industrial exposure.

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

## Tamil-I

Course code	16KUGE511	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	V

### 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. செளந்திரா கைலாசம் - தெய்வீகம் - வளம்பெற வரம் தருவான் (செளந்திரா கைலாசம் கவிதைகள்)

### அலகு III

1. சேதுபதி - இந்திய மாணவர் - (கனவுப்பிரதேசங்களில்)
2. ந. பிச்சமுர்த்தி - அக்னி(பிச்சமுர்த்தி 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 வளர்ச்சியும்
2. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்.

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### Mathematics - III

Course code	16KUGE512	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 Stirling's formula

#### Unit - IV

**TRIGONOMETRY:** 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  $\theta$  -

#### Unit - V

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

#### Text Book:

1. Numerical methods by P.Kandasamy, K.Thilakavathy, K.Gunavathy, 2003 Edition
2. Ancillary Mathematics (Volume I) by S. Narayanan, R. Hanumantha Rao, Manickavachagam Pillai and P. Kandaswamy, S.Viswanathan (Printers & Publishers) Pvt Ltd., 2007

## Total Quality Management

Course code	16KUGE513	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 -Customer focus - Customer orientation, Customer satisfaction, Customer complaints, Customer retention - 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 - Concepts of Six Sigma - 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.Besterfield, et al., "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

## DESIGN OF JIGS AND FIXTURES

Course code	16KUPT506	Credits	05	Year	III
No. of Lecture Hours	75	No. of Practical Hours	--	Sem	V

### Unit-I

**Organization's policies and procedures for creating mechanical designs** - roles and responsibilities of a designer - Microsoft office tools - presentation of designs - Sources of information and methodologies available - accessing - applied mechanics in practice - different types of simple mechanical designs and its uses - constraints - impact of constraints in mechanical designs - importance of design materials.

Creation of detailed drawings - Preparation of Bill of Materials (BOM) - Documents - knowledge sharing - creating documents for knowledge sharing - Organization's policies, procedures and guidelines for knowledge sharing - purpose and scope of knowledge sharing.

### Unit-II

**Team working - methods and techniques used in team working - tools, templates and language standards** - document preparation tools - word, excel, power point - uses of document preparation tools - Organization's policies, procedures and priorities for your area of work - roles and responsibilities to carry out the work - Specific work requirements - Accuracy - importance of completing work accurately - procedure for accurate working - timescales.

### Unit-III

**Organization's procedures, guidelines for providing data/information** - role and responsibilities in providing data/information - knowledge management culture - organization's policies and procedures for recording and sharing information - importance of complying the information - techniques used to obtain data/information - role based analysis - typical anomalies occur in data/information - reporting of inaccurate data/information

### Unit-IV

**Tool design objectives - Production devices** - Inspection devices - Materials used in Jigs and Fixtures - Types of Jigs - Types of Fixtures-Mechanical actuation-pneumatic and hydraulic actuation-Analysis of clamping force-Tolerance and error analysis.

**Drill bushes** -different types of jigs-plate latch, channel, box, post, angle plate, angular post, turnover, pot jigs-Automatic drill jigs-Rack and pinion operated. Air operated Jigs components. Design and development of Jigs for given components. General principles of boring, lathe, milling and broaching fixtures- Grinding, planning and shaping fixtures, assembly, Inspection and welding fixtures- Modular fixtures. Design and development of fixtures for given component.

## **Unit-V**

Press working terminology-Presses and press accessories-Computation of capacities and tonnage requirements. Elements of progressive combination and compound dies:Die block-die shoe. Bolster plate-punch plate-punch holder-guide pins and bushes - strippers -knockouts-stops -pilots-Selection of standard die sets strip lay out-strip lay out calculations.

**Design and development of progressive and compound dies for Blanking and piercing operations. Bending dies - development of bending dies-forming and drawing dies-Development of drawing dies. Design considerations in forging, extrusion, casting and plastic dies.**

(Use of approved design data book is permitted)

### **TEXT BOOKS**

1. Edward G Hoffman, Jigs & Fixture Design, Thomson - Delmar Learning, Singapore 2004
2. Donaldson. C, Tool Design, Tata McGraw-Hill, 1986

### **REFERENCES**

1. Kempster, "Jigs & Fixtures Design, The English Language Book Society", 1978
2. Joshi, P.H., "Jigs & Fixtures, Second Edition", Tata McGraw-Hill Publishing Company Limited, New Delhi 2004
3. Hiram E Grant, ' Jigs and Fixture' Tata McGraw-Hill, New Delhi, 2003
3. Fundamentals of Tool Design, CEEE Edition, ASTME, 1983
4. PSG College of Technology, Coimbatore - Design Data Handbook.



## PRACTICAL: DESIGN AND MANUFACTURING

Course code	16KUPT5P5	Credits	03	Year	III
No. of Lecture Hours	--	No. of Practical Hours	90	Sem	V

1. Introduction and 2D modelling
2. 3DSolid modelling
3. Surface and Sheet metal modelling
4. Drafting and assembly
5. Manufacturing

## Tamil-II

Course code	16KUGE614	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	VI

### 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

## Safety Engineering

Course code	16KUGE615	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	16KUGE616	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.

## PROJECT

Course code	16KUPT6PR	Credits	08	Year	III
No. of Lecture Hours	--	No. of Practical Hours	120	Sem	VI

Develop or design tool, die, jig or fixture working model suitable for real practical environment by implementing the theoretical and practical knowledge gained through the curriculum.

Develop the plan by considering the following parameters

- a) Material Requirement
- b) Analyze the specification and quantity of required materials
- 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	16KUPT6I3	Credits	20	Year	III
No. of Lecture Hours	--	No. of Practical Hours	1400	Sem	VI

#### OBJECTIVES:

- To Understand the work requirement
- To Understand the customer and market requirement
- To design and modify a tool or die as per the requirement
- To Report and document completion of work
- To research the existing designs and innovate new design modifications.

Students should undergo internship training in an esteemed Tool and Die making 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 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 and practical part includes two components.

Components	Internal Marks	External Marks	Total Marks
General Component (Theory)	50	50	100

### Continuous Internal Assessment:

Two CIA tests conducted for each paper during each semester.

### CIA for General and Skilled component:

S.No	Type	Units	Max. Marks
1.	CIA test - I	1 & 2	20 Marks
2.	CIA test - II	3, 4 & 5	25 Marks
<b>Total</b>			<b>45 Marks</b>

### Internal Marks

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
<b>Total</b>		<b>50 Marks</b>

## QUESTION PAPER PATTERN

- 1) The question paper pattern and coverage of syllabus for each CIA and External (semester) examinations for Basic English, Mathematics-I, Office Automation, Professional English and Value Education.

### CIA TEST - I (Unit 1 & 2 only)

**Time: 1Hour**

**Max. Marks: 20**

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

### CIA TEST - II (Unit 3, 4 & 5 only)

**Time: 1½ Hour**

**Max. Marks: 25**

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

### SEMESTER EXAMINATION (All Five Units)

**Time: 2 Hours**

**Max. Marks: 50**

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

- 2) The question paper pattern for Environmental Studies will be conducted through online exam for internal Assessment and Semester Examination.

### **SCHEME OF EXAMINATION (for Vocational Education Component)**

The question paper pattern and coverage of syllabus for theory and practical will be conducted by Electronics Sector Skill Council (ESSC) of National Skill Development Corporation(NSDC).