



**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 2018-2019 Onwards)**

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

**B.VOC (Production Technology (Tool & Die))**

For Students admitted from 2018-2019 & 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.

## **Programme Educational Objectives**

The Department of Production Technology (Tool & Die) provides the best learning resources for the students which aimed at bridging the gap of industry requirement in the field of production and maintenance of tool and die by providing earn while you learn facility and OJT's.

The program educational outcomes are given below:

**PEO1:** Making students knowledgeable in basic science, mathematics and basic machining operations.

**PEO2:** Imparting analytic skills to develop initiatives and innovative ideas for industrial as well as societal needs.

**PEO3:** Providing students the required theoretical and practical knowledge in the field of tool and die making.

**PEO4:** Imparting the qualities of team work as well as social, interpersonal and leadership skills and an ability to adapt professional environment.

**PEO5:** Evaluating that the students have adequate knowledge and skills, so that they are work ready at exit point of the programme.

## **Programme Outcomes:**

- Ability to apply the knowledge of basic engineering principles in tool and die making.
- Ability to analyze and solve the problems.
- An ability to use the techniques, skills and modern engineering tools.
- An ability to design a system, component or process to meet the desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability.
- An ability to function on multidisciplinary teams.
- An understanding of professional and ethical responsibility.
- An ability to communicate effectively.
- Recognition of need for, and an ability to engage in life-long learning.

**SCHEME OF EXAMINATION**

**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>									
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
<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>									
18KUP1C01	III	Core I: Planning and Fitting	60	-	2	50	50	100	4
18KUP1C02	III	Core II: Lathe	60	-	2	50	50	100	4
<b>Sub Total (B)</b>			<b>120</b>	<b>-</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>-</b>	<b>10</b>	<b>250</b>	<b>250</b>	<b>500</b>	<b>20</b>

**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>									
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
<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>									
18KUP2C03	III	Core III: Special Machines	60	-	2	50	50	100	4
18KUPT2P1	III	Practical I: Fitting and Lathe	-	60	3	50	50	100	2
18KUPT2P2	III	Practical II: Special Machines	-	60	3	50	50	100	2
18KUPT2I1	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>4000</b>	<b>600</b>	<b>1000</b>	<b>40</b>

**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>									
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
<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>									
18KUP3C04	III	Core IV: CNC Machines & EDM	75	-	2	50	50	100	5
18KUPT3P3	III	Practical III: : CNC Machines & EDM	-	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>255</b>	<b>90</b>	<b>11</b>	<b>250</b>	<b>250</b>	<b>500</b>	<b>20</b>

**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>									
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
<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>									
18KUP4C05	III	Core V: Drafting and Plotting	75	-	2	50	50	100	5
18KUPT4P4	III	Practical IV: Drafting and Plotting	-	90	3	50	50	100	3
18KUPT4I2	III	Internship Training-II	-	1400	3	100	300	400	20
<b>Sub Total (B)</b>			<b>75</b>	<b>1490</b>	<b>8</b>	<b>200</b>	<b>400</b>	<b>600</b>	<b>28</b>
<b>Total (A +B)</b>			<b>255</b>	<b>1490</b>	<b>14</b>	<b>350</b>	<b>550</b>	<b>900</b>	<b>40</b>

**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>									
18KUG5EL2	III	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
<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>									
18KUP5C06	III	Core VI: Design of Jigs and Fixtures	75	-	2	50	50	100	5
18KUPT5P5	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>255</b>	<b>90</b>	<b>11</b>	<b>250</b>	<b>250</b>	<b>500</b>	<b>20</b>



**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>									
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
<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>									
18KUPT6PR	III	Project	-	240	3	50	50	100	8
18KUPT6I3	III	Internship Training-III	-	1400	3	100	300	400	20
<b>Sub Total (B)</b>			<b>-</b>	<b>1640</b>	<b>06</b>	<b>150</b>	<b>350</b>	<b>500</b>	<b>28</b>
<b>Total (A +B)</b>			<b>-</b>	<b>1640</b>	<b>15</b>	<b>300</b>	<b>500</b>	<b>800</b>	<b>40</b>

<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>

## 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 - செய்யும் தொழிலேதெய்வம்  
கல்யாணசுந்தரம்

### அலகு II புதுக்கவிதை - I

1. கவிஞர் வாலி - தூக்கத்தில் ஒருதுவந்த யுத்தம் - (நிஜகோவிந்தம்)
2. வைரமுத்து - அவன் கலைமகளுக்குப் பாடஞ் சொல்லுகிறான்  
(திருத்திஎழுதியதீர்ப்புகள்)
3. செளந்திராகைலாசம் - தெய்வீகம் - வளம்பெறவரம் தருவாள்  
(செளந்திராகைலாசம் கவிதைகள்)

### அலகு III

1. சேதுபதி - இந்தியமாணவர் - (கனவுப்பிரதேசங்களில்)
2. ந. பிச்சமுர்த்தி - அக்னி (பிச்சமுர்த்திகவிதைகள்)

### அலகு IV - பயன்பாட்டுத் தமிழ்

1. விண்ணப்பக் கடிதம் எழுதப் பயிற்சி
2. வல்லினம் மிகும் இடங்கள்
3. வல்லினம் மிகா இடங்கள்
4. பிழைநீக்கிஎழுதுதல்

### அலகு V இலக்கியவரலாறு - I

1. சிறுகதையின் இலக்கியத் தோற்றமும் வளர்ச்சியும்
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

### 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, RadhakrishnaG.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

### 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

## PLANNING AND FITTING

Course code	18KUP1C01	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

### OBJECTIVES:

- Basic concepts of Planning and fitting
- Types of fitting and various tools used in fitting
- Various fitting operations

### OUTCOMES:

- Student will be able to do any type of fitting without any error.

### 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.

### **REFERENCE:**

- Fitting and machining by Ron Culley published by TAFE Publications.
- Mechanical Technology Grade 10: Fitting and machining learner book by D Meyer and BH Van Der Westhuizen.
- Fitter trade theory by Balbir Singh.

## LATHE

Course code	18KUP1C02	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

### OBJECTIVES:

- Importance of Lathe
- Types and various operations performed in a Lathe
- Safety in Lathe
- Various special attachments in Lathe

### OUTCOMES:

- Student will be able to operate a lathe to produce any component.
- Student will be able to work safely in a workshop.

### 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.



**REFERENCE:**

- The Lathe book : A complete guide to the machine and its accessories by Ernie Conover
- The metal Lathe by David J Gingery

## 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 - (“மந்திரமாவதுநீற்று...” எனத் தொடங்கும் பதிகம்)
2. திருநாவுக்கரசர் - திருஅங்கமாலை - (“தலையேநீவணங்காய்” எனத் தொடங்கும் பதிகம்)

### அலகு II வைணவ இலக்கியங்கள்

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

### அலகு III சிற்றிலக்கியங்கள் - பிற்கால இலக்கியம்

1. குமரகுருபரர் - மதுரைமீனாட்சியம்மைபிள்ளைத் தமிழ்
  1. தாலப் பருவம் - (31)  
(“முதுசொற் புலவர் தெளித்த” எனத் தொடங்கும் பாடல்)
  2. அம்புலிப் பருவம் (72)  
(“ஏடகத்தெழுதாத” எனத் தொடங்கும் பாடல்)
2. தாயுமானவர் - எந்நாட்கண்ணி- (தெய்வவணக்கம் - 11 கண்ணிகள்)

### அலகு IV இலக்கியவரலாறு - II

பன்னிருதிருமுறைகள்

### அலகு V இலக்கியவரலாறு-III

பன்னிருஆழ்வார்கள்

## PROFESSIONAL ENGLISH

Course code	18KUG2EN2	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.

## OFFICE AUTOMATION

Course code	18KUG2AL2	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.

## SPECIAL MACHINES

Course code	18KUP2C03	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	II

### OBJECTIVES:

- Various machineries used in production.
- Various types of drilling, milling and grinding machines.
- Importance of special machines in production

### OUTCOMES:

- Student will be able to operate all the special machines used in production.

### 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.

## REFERENCE:

- Machinist handbook for the apprentice by David B Smith
- Fundamentals of Machining processes : Conventional and Nonconventional Processes by Hassan Abdel - GawadEi-Hofy.

## PRACTICAL: FITTING AND LATHE

Course code	18KUPT2P1	Credits	02	Year	I
No. of Lecture Hours	--	No. of Practical Hours	60	Sem	II

### OBJECTIVES:

- To introduce different machining process and machine tool to develop components.

### OUTCOMES:

- Ability to use the machine tool and processes to shape and fabricate the components.

### 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	18KUPT2P2	Credits	02	Year	I
No. of Lecture Hours	--	No. of Practical Hours	60	Sem	II

### Objectives:

- To Study and practice the various operations that can be performed in lathe, shaper, drilling, milling machines etc. and to equip with the practical knowledge required in the core industries.

### Outcomes:

- Ability to demonstrate and fabricate different types of components using the machine tools.
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	18KUPT2I1	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.

### Outcomes:

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	18KUG3EN3	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	18KUG3AL3	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.

## ENVIRONMENTAL STUDIES

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

### 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, manwildlife 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.

## CNC MACHINES AND EDM

Course code	18KUP3C04	Credits	05	Year	II
No. of Lecture Hours	75	No. of Practical Hours	--	Sem	III

### OBJECTIVES:

- Understand concepts of Computer Numerical Control
- Fundamentals of CNC and EDM
- Understand the conventional and unconventional machining processes
- Importance of CNC and EDM

### OUTCOMES:

- Student will be able to operate CNC machines and EDM
- Student will be able to write a part program for any component and setting up in machines.

### 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-IV

**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

**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.

### Unit-V

**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.

**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.

### REFERENCE:

- CNC Machines by B.S.Pabla and M.Adithan : New age international publishers
- CNC Programming handbook by Peter Smid
- EDM handbook by E.BudGuitrau
- Electrical Discharge Machining by Dr M P Jahan

## PRACTICAL: CNC MACHINES AND EDM

Course code	18KUPT3P3	Credits	03	Year	II
No. of Lecture Hours	--	No. of Practical Hours	90	Sem	III

### OBJECTIVES:

- To train the students to write CNC Programming to simulate tool path simulation for different components.

### Outcomes:

- Ability to perform programming on CNC machine and simulate tool path movement and also able to apply the programming to machine industrial components

### 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

## TECHNICAL DRAWING

Course code	18KUG4AL4	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

- Geometric construction
- Orthographic and Isometric projections
- Symbols widely used in Electrical and Electronics circuits

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



## PRINCIPLES OF MANAGEMENT

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

### 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 - 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 - I

விழுமியம் - சொற்பொருள் விளக்கம் - தனிமனிதவிழுமியங்கள் - சமூக விழுமியங்கள் - பண்பாட்டுவிழுமியங்கள் - ஆன்மீகவிழுமியங்கள்.

### அலகு- II

**தனிமனிதவிழுமியங்கள்** - சிந்தனைகள் தனிமனிதஒழுக்கம் - அன்பு - பொறுமை - நன்னெறி - கருணை - இரக்கம் - குற்றம் - சட்டம் - தண்டனை.

### அலகு- III

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

### அலகு- IV

**சமூக விழுமியங்கள்** - காந்தீயவிழுமியங்கள் - பாரதிகாட்டும் சமூக விழுமியங்கள் - வ. உ. சிதம்பரம் வாழ்வியல் விழுமியம்.

### அலகு- V

**ஆன்மீகவிழுமியங்கள்** - குருதேவர் ஸ்ரீ ராமகிருஷ்ணர் வாழ்வும் வாக்கும் - சுவாமிவிவேகானந்தரின் வாழ்வியல் நெறிகள் - புத்தர் காட்டும் ஆன்மீகவிழுமியங்கள்.

குறிப்பு தயாரிக்கப்பட்டபாடஉரைஅளிக்கப்படும்

## DRAFTING AND PLOTTING

Course code	18KUP4C05	Credits	05	Year	II
No. of Lecture Hours	75	No. of Practical Hours	--	Sem	IV

### OBJECTIVES:

- To understand the need of Drafting and plotting
- To understand the design requirements
- To create and modify the design

### OUTCOMES:

- Student will be able to create and edit the design.
- Student will be able to modify the designs as per the requirement.

### 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,DRAFTING, EDITING AND TRANSFORMING 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 ChapterTrim 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 : LAYERS AND ANNOTATIONS

**Creating and Editing Layers**- Layer Properties and Manager- Freeze, Thaw, On, Off, and LockDimensions and its Styles- Dimensioning Tools And Settings- Multileaders-Single and Multiline Text- Text Styles and Tables- Chapter Project

### UNIT - V : BLOCKS, PLOT AND PUBLISH

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

**REFERENCE:**

- A text book of Engineering drawing by Roop Lal and Ramakant Rana
- Engineering graphics with Autocad by D.M.Kulkarni, A.P.Rastogi, A.K.Sarkar

## PRACTICAL: DRAFTING AND PLOTTING

Course code	18KUPT4P4	Credits	03	Year	II
No. of Lecture Hours	--	No. of Practical Hours	90	Sem	IV

### OBJECTIVES:

- To develop skill to use software to create 2D and 3D models.

### OUTCOMES:

- Ability to use the software packers for drafting and modeling.
  - Ability to create 2D and 3D models of Engineering Components.
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	18KUPT4I2	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

### Outcomes:

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.

## 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 - PDCA 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.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

### 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 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



## INDIAN VALUES

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

### 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- BalangatharaThilak- Vinobabave- NethajiSubash Chandra Bosh- Baghatsingh, Rajaguru, Sukdev- TheeranChinnamalai- Dr. A.P.J. AbdhulKalam.

### UNIT V- Importance days of India

Independence Day -Republic Day- Dandhi Salt March- JallianwallahBagh 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

## DESIGN OF JIGS AND FIXTURES

Course code	18KUP5C06	Credits	05	Year	III
No. of Lecture Hours	75	No. of Practical Hours	--	Sem	V

### OBJECTIVES:

- Understand the need of jigs and fixtures
- Understand the difference between jigs and fixtures
- Designing of jigs and fixtures as per the requirement

### OUTCOMES:

- Student will be able to design and manufacture jigs and fixtures for the requirement

### 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, ASTM, 1983
4. PSG College of Technology, Coimbatore - Design Data Handbook.

## PRACTICAL: DESIGN AND MANUFACTURING

Course code	18KUPT5P5	Credits	03	Year	III
No. of Lecture Hours	--	No. of Practical Hours	90	Sem	V

### OBJECTIVES:

- To give exposure to software tools needed to analyze engineering problems.
- To expose the students to different applications of simulation and analysis tools.

### OUTCOMES:

- Create the new ideas and knowledge about Creo software.
- Understand the various methods and commands in Creo software's.

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

## PROFESSIONAL ETHICS AND HUMAN VALUES

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

### 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

## 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.RayAsfahl ,*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. KhakaSS, Entrepreneurship Development, S. Chand & Co. Ltd. 2010.
3. Vasant Desai. The Dynamics of Entrepreneurship Development and Management.  
Gupta C. B, Srinivasan N.P. Entrepreneurship Development, S. Chand & Co. Ltd. 2011.

## PROJECT

Course code	18KUPT6PR	Credits	08	Year	III
No. of Lecture Hours	--	No. of Practical Hours	240	Sem	VI

### Objectives:

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.

### Outcomes:

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	18KUPT6I3	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.

#### Outcomes:

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 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.

<b>Components</b>	<b>Internal Marks</b>	<b>External Marks</b>	<b>Total Marks</b>
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):**

<b>S.No</b>	<b>Type</b>	<b>Units</b>	<b>Max. Marks</b>
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 (Theory):**

<b>Internal Marks- Break up (50 Marks)</b>		
A	CIA - I & CIA - II test (45 marks converted to 30 Marks)	<b>30 Marks</b>
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	<b>10 Marks</b>
C	Marks for Assignment / Seminar	<b>10 Marks</b>
<b>Total</b>		<b>50 Marks</b>

**Internal Marks (Practical):**

<b>Internal Marks- Break up (100 Marks)</b>		
A	Model practical Examination	<b>50 Marks</b>
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	<b>10 Marks</b>
C	Record Note	<b>20 Marks</b>
D	Overall performance in the class	<b>20 Marks</b>
<b>Total</b>		<b>100 Marks</b>

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

## 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: 1Hour

Max. Marks: 20

Part - A	<b>No choice</b> (Five questions from unit 1 & 2)	5 x 2 = 10
Part - B	<b>Two out of three</b> (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	<b>No choice</b> (Five questions from unit 3, 4 & 5)	5 x 2 = 10
Part - B	<b>Answer any Three questions out of Five</b> (Five questions from unit 3, 4 & 5)	3 x 5 = 15

### SEMESTER EXAMINATION (All Five Units)

Time: 2 Hours

Max. Marks: 50

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