# Sri Ramakrishna Mission Vidyalaya College of Arts and Science

# (AUTONOMOUS)

For Students admitted from 2019-2020 & onwards

**COURSE OF STUDY**

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

**ELIGIBILITY:**

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

**PROGRAMME OUTCOMES:**

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

The program Educational Objectives are as follows:

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

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

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

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

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

**PROGRAMME SPECIFIC OUTCOMES:**

**PSO1.** Ability to apply knowledge of vehicle science and automobile fundamentals in the field of competitive automotive field.

**PSO2.** Understand the applications of electrical, electronics and hydraulic devices in the field of Automobile.

**PSO3.** Diagnose the automotive system failures and repair / replace the components / systems so as to bring the vehicle in original condition.

**PSO4.** Ability to work in an industry as a team member as well as an individual with professional qualities and evolve oneself for lifelong learning.

**PSO5.** Ability to lead professionally in an industrial environment by applying managerial and technical skills related to Research and development, production and service activities.

## 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 | | |
| **GENERAL EDUCATION COMPONENT** | | | | | | | | | |
| 18KUG1TA1 | I | Tamil I | 60 | - | 2 | 50 | 50 | 100 | 4 |
| 18KUG1EN1 | II | Basic English | 60 | - | 2 | 50 | 50 | 100 | 4 |
| 18KUG1AL1 | III | Allied I: Mathematics- I | 60 | - | 2 | 50 | 50 | 100 | 4 |
| **Sub Total (A)** | | | **180** | **-** | **06** | **150** | **150** | **300** | **12** |
| **VOCATIONAL EDUCATION COMPONENT** | | | | | | | | | |
| 19KUA1C01 | III | Core I: Basic Automobile Technology | 60 | - | 2 | 50 | 50 | 100 | 4 |
| 19KUA1C02 | III | Core II: Automotive Electrical and Electronics | 60 | - | 2 | 50 | 50 | 100 | 4 |
| **Sub Total (B)** | | | **120** | **-** | **04** | **100** | **100** | **200** | **08** |
| **Total (A +B)** | | | **300** | **-** | **10** | **250** | **250** | **500** | **20** |

**T-Theory**

**P-Practical**

## SEMESTER – II

| Course Code | Part | Name of the Subject | Lecture / Practical Hrs | | Duration of Exam in Hours | Marks | | Total Marks | Credits |
|---|---|---|---|---|---|---|---|---|---|
| | | | Lecture | Practical / Field Work | | Internal | External | | |
| **GENERAL EDUCATION COMPONENT** | | | | | | | | | |
| 18KUG2TA2 | I | Tamil II | 60 | - | 2 | 50 | 50 | 100 | 4 |
| 18KUG2EN2 | II | Professional English | 60 | - | 2 | 50 | 50 | 100 | 4 |
| 18KUG2AL2 | III | Allied II: Office Automation | 60 | - | 2 | 50 | 50 | 100 | 4 |
| **Sub Total (A)** | | | **180** | **-** | **06** | **150** | **150** | **300** | **12** |
| **VOCATIONAL EDUCATION COMPONENT** | | | | | | | | | |
| 19KUA2C03 | III | Core III: Automobile Technology and Maintenance | 60 | - | 2 | 50 | 50 | 100 | 4 |
| 19KUAT2P1 | III | Practical I: Automotive Electrical and Electronics | - | 60 | 3 | 50 | 50 | 100 | 2 |
| 18KUAT2P2 | III | Practical II: Automobile Repair and Maintenance Lab –I | - | 60 | 3 | 50 | 50 | 100 | 2 |
| 18KUAT2I1 | III | Internship Training-I | - | 1200 | 3 | 100 | 300 | 400 | 20 |
| **Sub Total (B)** | | | **60** | **1320** | **11** | **250** | **450** | **700** | **28** |
| **Total (A+B)** | | | **240** | **1320** | **17** | **400** | **600** | **1000** | **40** |

**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 | | |
| **GENERAL EDUCATION COMPONENT** | | | | | | | | | |
| 18KUG3EN3 | II | Technical Communication | 60 | - | 2 | 50 | 50 | 100 | 4 |
| 18KUG3AL3 | III | Allied III: Mathematics-II | 60 | - | 2 | 50 | 50 | 100 | 4 |
| 18KUG3ENS | IV | Environmental studies | 60 | - | 2 | 50 | 50 | 100 | 4 |
| **Sub Total (A)** | | | **180** | **-** | **06** | **150** | **150** | **300** | **12** |
| **VOCATIONAL EDUCATION COMPONENT** | | | | | | | | | |
| 19KUA3C04 | III | Core IV: Advanced Automobile Technology | 60 | - | 2 | 50 | 50 | 100 | 4 |
| 19KUA3C05 | III | Core V: Automobile Repair and Maintenance | 60 | - | 2 | 50 | 50 | 100 | 4 |
| **Sub Total (B)** | | | **120** | **-** | **04** | **100** | **100** | **200** | **08** |
| **Total (A +B)** | | | **300** | **-** | **10** | **250** | **250** | **500** | **20** |

**T-Theory**

**P-Practical**

## SEMESTER – IV

| Course Code | Part | Name of the Subject | Lecture / Practical Hrs | | Duration of Exam in Hours | Marks | | Total Marks | Credits |
|---|---|---|---|---|---|---|---|---|---|
| | | | Lecture | Practical / Field Work | | Internal | External | | |
| **GENERAL EDUCATION COMPONENT** | | | | | | | | | |
| 18KUG4AL4 | III | Allied IV: Technical Drawing | 60 | - | 2 | 50 | 50 | 100 | 4 |
| 18KUG4EL1 | III | Elective I: Principles of Management | 60 | - | 2 | 50 | 50 | 100 | 4 |
| 18KUG4VAD | IV | Value Education | 60 | - | 2 | 50 | 50 | 100 | 4 |
| **Sub Total (A)** | | | **180** | **-** | **06** | **150** | **150** | **300** | **12** |
| **VOCATIONAL EDUCATION COMPONENT** | | | | | | | | | |
| 19KUA4C06 | III | Core VI: Automotive Safety | 60 | - | 2 | 50 | 50 | 100 | 4 |
| 18KUAT4P3 | III | Practical III: Workshop Technology Lab – I | - | 120 | 3 | 50 | 50 | 100 | 4 |
| 18KUAT4I2 | III | Internship Training-II | - | 1200 | 3 | 100 | 300 | 400 | 20 |
| **Sub Total (B)** | | | **60** | **1320** | **08** | **200** | **400** | **600** | **28** |
| **Total (A +B)** | | | **240** | **1320** | **14** | **350** | **550** | **900** | **40** |

**T-Theory**

**P-Practical**

## SEMESTER – V

| Course Code | Part | Name of the Subject | Lecture / Practical Hrs | | Duration of Exam in Hours | Marks | | Total Marks | Credits |
|---|---|---|---|---|---|---|---|---|---|
| | | | Lecture | Practical / Field Work | | Internal | External | | |
| **GENERAL EDUCATION COMPONENT** | | | | | | | | | |
| 18KUG5EL2 | II | Elective II: Total Quality Management | 60 | - | 2 | 50 | 50 | 100 | 4 |
| 18KUG5AL5 | III | Allied V: Mathematics – III | 60 | - | 2 | 50 | 50 | 100 | 4 |
| 18KUG5EL3 | III | Elective III: Indian Values | 60 | - | 2 | 50 | 50 | 100 | 4 |
| **Sub Total (A)** | | | **180** | **-** | **06** | **150** | **150** | **300** | **12** |
| **VOCATIONAL EDUCATION COMPONENT** | | | | | | | | | |
| 18KUA5C07 | III | Core VII: Workshop Supervising and Management | 75 | - | 2 | 50 | 50 | 100 | 5 |
| 18KUAT5P4 | III | Practical IV: Workshop Practice Lab | - | 90 | 2 | 50 | 50 | 100 | 3 |
| **Sub Total (B)** | | | **75** | **90** | **04** | **100** | **100** | **200** | **08** |
| **Total (A +B)** | | | **255** | **90** | **10** | **250** | **250** | **500** | **20** |

**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 | External | | |
| **GENERAL EDUCATION COMPONENT** | | | | | | | | | |
| 18KUG6EL4 | III | Elective IV: Professional Ethics and Human Values | 60 | - | 2 | 50 | 50 | 100 | 4 |
| 18KUG6EL5 | III | Elective V: Safety Engineering | 60 | - | 2 | 50 | 50 | 100 | 4 |
| 18KUG6EL6 | III | Elective VI: Entrepreneurship Development | 60 | - | 2 | 50 | 50 | 100 | 4 |
| **Sub Total (A)** | | | **180** | **-** | **06** | **150** | **150** | **300** | **12** |
| **VOCATIONAL EDUCATION COMPONENT** | | | | | | | | | |
| 18KUAT6PR | III | Project | - | 240 | 3 | 50 | 50 | 100 | 8 |
| 18KUAT6I3 | III | Internship Training-III | - | 1200 | 3 | 100 | 300 | 400 | 20 |
| **Sub Total (B)** | | | **-** | **1440** | **06** | **200** | **400** | **600** | **28** |
| **Total (A +B)** | | | **180** | **1440** | **12** | **350** | **550** | **900** | **40** |

**T-Theory**

**P-Practical**

| COURSE | CREDITS | MARKS |
|---|---|---|
| Language | 8 | 200 |
| English | 12 | 300 |
| Part III: Core & Elective ,Allied | 152 | 3500 |
| Environmental Studies | 4 | 100 |
| Value Education | 4 | 100 |
| **Total** | **180** | **4200** |

**Tamil-I**

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L - Low

## BASIC ENGLISH

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L - Low

## MATHEMATICS – I

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L - Low

## Basic Automobile Technology

| Course code | 19KUA1C01 | Credits | 04 | Year | I |
|---|---|---|---|---|---|
| No. of Lecture Hours | 60 | No. of Practical Hours | -- | Sem | I |

**Course Outcomes (CO)**

| | | |
|---|---|---|
| **CO1** | The main objective of this course is to impart knowledge in automotive vehicle. | **K** |
| **CO2** | The students will understand the constructional, working principle of various sub system of an automotive vehicle. | **U & S** |

K-Knowledge U- Understand S-Skill

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

S – Strong; M – Medium; L - Low

## Automotive Electrical and Electronics

| Course code | 19KUA1C02 | Credits | 04 | Year | I |
|---|---|---|---|---|---|
| No. of Lecture Hours | 60 | No. of Practical Hours | -- | Sem | I |

**Course Outcomes (CO)**

| | | |
|---|---|---|
| **CO1** | The students will be able to understand and working of the automotive electrical and electronic system components, possible causes of defects and their repairs. | **K,U&S** |
| **CO2** | Understand the operation of vehicle sensors, actuators and display units. | **U & S** |
| **CO3** | Be able to carry out systematic fault diagnosis and repairs on vehicle electronic system. | **U&S** |

K-Knowledge U- Understand S-Skill

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

S – Strong; M – Medium; L - Low

**Tamil-II**

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L – Low

**PROFESSIONAL ENGLISH**

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium;L - Low

**OFFICE AUTOMATION**

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L - Low

## Automobile Technology and Maintenance

| Course code | 19KUA2C03 | Credits | 04 | Year | I |
|---|---|---|---|---|---|
| No. of Lecture Hours | 60 | No. of Practical Hours | -- | Sem | II |

**Course Outcomes (CO)**

| | | |
|---|---|---|
| **CO1** | The student will be able to understand the construction, function and working of individual component and the system in which it functions. | **K & U** |
| **CO2** | The student will also be able to understand the need of maintenance service to prevent or remove the defects that may come up. | **K,U &S** |

K-Knowledge U- Understand S-Skill

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

S – Strong; M – Medium; L - Low

## Automotive Electrical and Electronics

| Course code | 19KUAT2P1 | Credits | 02 | Year | I |
|---|---|---|---|---|---|
| No. of Lecture Hours | -- | No. of Practical Hours | 60 | Sem | II |

**Course Outcomes (CO)**

| | | |
|---|---|---|
| **CO1** | Ability to rectify and faults in electrical and electronics systems and maintain the same. | **K,U&S** |

K-Knowledge U- Understand S-Skill

| | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | S | S | S | S | M | | S | S | S | S | M |

S – Strong; M – Medium; L – Low

## Automobile Repair and maintenance Lab –I

| Course code | 18KUAT2P2 | Credits | 02 | Year | I |
|---|---|---|---|---|---|
| No. of Lecture Hours | -- | No. of Practical Hours | 60 | Sem | II |

**Course Outcomes (CO)**

| | | |
|---|---|---|
| **CO1** | Ability to identify the faults and knowledge on maintenance | **K&U** |
| **CO2** | Diagnosis of the operational faults to identify the root cause of the trouble and take necessary action to repair the vehicle | **U&S** |

K-Knowledge U- Understand S-Skill

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

S – Strong; M – Medium; L – Low

## Internship Training -I

| Course code | 18KUAT2I1 | Credits | 20 | Year | I |
|---|---|---|---|---|---|
| No. of Lecture Hours | -- | No. of Practical Hours | 1200 | Sem | II |

**Course Outcomes (CO)**

| | | |
|---|---|---|
| **CO1** | Maintaining and troubleshooting technology. | **K** |
| **CO2** | Writing requirements documentation | **U&S** |
| **CO3** | Performing effective and informative user testing. Improving problem-solving and critical thinking skills. | **U&S** |
| **CO4** | Monitoring and correcting performance, Exercising leadership Behaving professionally and Listening effectively. | **K&S** |
| **CO5** | Allocating time effectively, Teaching others and Developing individual responsibility. | **U&S** |

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L – Low

## TECHNICAL COMMUNICATION

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L - Low

**MATHEMATICS – II**

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L - Low

**ENVIRONMENTAL STUDIES**

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L - Low

## Advanced Automobile Technology

| Course code | 19KUA3C04 | Credits | 04 | Year | II |
|---|---|---|---|---|---|
| No. of Lecture Hours | 60 | No. of Practical Hours | -- | Sem | III |

**Course Outcomes (CO)**

| | | |
|---|---|---|
| **CO1** | The students will understand the recent development pertain to energy system, vehicle operation, newer vehicle, recent technologies in the area of Automobile Engineering. | **K,U&S** |

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L - Low

## Automobile Repair and Maintenance

| Course code | 19KUA3C05 | Credits | 05 | Year | II |
|---|---|---|---|---|---|
| No. of Lecture Hours | 75 | No. of Practical Hours | -- | Sem | III |

**Course Outcomes (CO)**

| | | |
|---|---|---|
| **CO1** | This knowledge will be helpful to the student in understanding maintenance schedules, maintaining records, maintenance of engine, other mechanical and electrical systems beside co-relating various systems with each other and understanding the individual system in a better manner. | **K&U** |

K-Knowledge U- Understand S-Skill

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

S – Strong; M – Medium; L - Low

## TECHNICAL DRAWING

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L - Low

## PRINCIPLES OF MANAGEMENT

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L - Low

## Automotive Safety

| Course code | 19KUA4C06 | Credits | 04 | Year | II |
|---|---|---|---|---|---|
| No. of Lecture Hours | 60 | No. of Practical Hours | -- | Sem | IV |

**Course Outcomes (CO)**

| | | |
|---|---|---|
| **CO1** | The student will be familiar in various systems that enhances vehicle safety, passenger comfort, recent technologies in automobile field etc. | **U&S** |

K-Knowledge U- Understand S-Skill

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

S – Strong; M – Medium; L - Low

## Workshop Technology Lab –I

| | | | | | |
|---|---|---|---|---|---|
| Course code | 18KUAT4P3 | Credits | 03 | Year | II |
| No. of Lecture Hours | -- | No. of Practical Hours | 90 | Sem | IV |

**Course Outcomes (CO)**

| | | |
|---|---|---|
| **CO1** | Diagnose and repair all major vehicle systems. | **U&S** |
| **CO2** | Document repairs of vehicles accurately and descriptive of concern, cause, and correction. | **K,U & S** |

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L - Low

## Internship Training -II

| Course code | 18KUAT4I2 | Credits | 20 | Year | II |
|---|---|---|---|---|---|
| No. of Lecture Hours | -- | No. of Practical Hours | 1200 | Sem | IV |

**Course Outcomes (CO)**

| | | |
|---|---|---|
| **CO1** | Maintaining and troubleshooting technology. | **K** |
| **CO2** | Writing requirements documentation | **U&S** |
| **CO3** | Performing effective and informative user testing. Improving problem-solving and critical thinking skills. | **U&S** |
| **CO4** | Monitoring and correcting performance, Exercising leadership Behaving professionally and Listening effectively. | **K&S** |
| **CO5** | Allocating time effectively, Teaching others and Developing individual responsibility. | **U&S** |

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L – Low

## Total Quality Management

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L - Low

**Mathematics – III**

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium;L - Low

**INDIAN VALUES**

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L - Low

## Workshop Supervising and Management

| Course code | 18KUA5C07 | Credits | 05 | Year | III |
|---|---|---|---|---|---|
| No. of Lecture Hours | 75 | No. of Practical Hours | -- | Sem | V |

**Course Outcomes (CO)**

| | | |
|---|---|---|
| **CO1** | Identifying, understanding and working with professional standards. | **K&U** |
| **CO2** | Manage quality issues in the work done by the technicians and components/ aggregate specialists to reduce rework or repeat complaints | **K,U&S** |

K-Knowledge U- Understand S-Skill

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

S – Strong; M – Medium; L - Low

## Workshop Practice Lab

| Course code | 18KUAT5P4 | Credits | 03 | Year | III |
|---|---|---|---|---|---|
| No. of Lecture Hours | -- | No. of Practical Hours | 90 | Sem | V |

**Course Outcomes (CO)**

| | | |
|---|---|---|
| **CO1** | Differentiate the various forms and records of work shop. | **K&U** |
| **CO2** | Use the Electrical equipments and trouble shooting | **U & S** |
| **CO3** | Identify the faults and knowledge on maintenance | **K,U & S** |
| **CO4** | Understand the Four wheeler vehicle trouble shooting and Maintenance | **U&S** |

K- Knowledge, U – Understand, S - Skill

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

**PROFESSIONAL ETHICS AND HUMAN VALUES**

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L - Low

## Safety Engineering

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L - Low

**Entrepreneurship Development**

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

**Course Outcomes (CO)**

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

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L - Low

## Project

| Course code | 18KUAT6PR | Credits | 08 | Year | III |
|---|---|---|---|---|---|
| No. of Lecture Hours | -- | No. of Practical Hours | 240 | Sem | VI |

**Course Outcomes (CO)**

| | | |
|---|---|---|
| **CO1** | On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology. | **K,U & S** |

K- Knowledge, U – Understand, S – Skill

| | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** | | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | S | S | S | S | S | | S | S | S | S | S |

## Internship Training -III

| Course code | 18KUAT6I3 | Credits | 20 | Year | III |
|---|---|---|---|---|---|
| No. of Lecture Hours | -- | No. of Practical Hours | 1200 | Sem | VI |

**Course Outcomes (CO)**

| | | |
|---|---|---|
| **CO1** | Maintaining and troubleshooting technology. | **K** |
| **CO2** | Writing requirements documentation | **U&S** |
| **CO3** | Performing effective and informative user testing. Improving problem-solving and critical thinking skills. | **U&S** |
| **CO4** | Monitoring and correcting performance, Exercising leadership Behaving professionally and Listening effectively. | **K&S** |
| **CO5** | Allocating time effectively, Teaching others and Developing individual responsibility. | **U&S** |

K- Knowledge, U – Understand, S - Skill

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

S – Strong; M – Medium; L – Low

**TAMIL-I**

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

**அலகு I மரபுக்கவிதை**

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

**அலகு II புதுக்கவிதை - I**

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

**அலகு III**

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

**அலகு IV - பயன்பாட்டுத் தமிழ்**

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

**அலகு V இலக்கிய வரலாறு - I**

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

* * * * *

## BASIC ENGLISH

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

**UNIT-I**

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

**UNIT-II**

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

**UNIT-III**

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

**UNIT-IV**

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

**UNIT-V**

Linkers, Spotting Errors, Concord.

**PRESCRIBED TEXT:**

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

**SUGGESTED READING:**


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

## MATHEMATICS – I

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

**UNIT - I**

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

**UNIT – II**

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

**UNIT – III**

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

**UNIT – IV**

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

**UNIT – V**

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

**Text Books:**

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

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

## Basic Automobile Technology

| Course code | 19KUA1C01 | Credits | 04 | Year | I |
|---|---|---|---|---|---|
| No. of Lecture Hours | 60 | No. of Practical Hours | -- | Sem | I |

**UNIT – I**

Constructional details of spark ignition (SI) and compression ignition (CI) engines. Working principles. Two stroke SI and CI engines – construction and working. Comparison of SI and CI engines and four stroke and two stroke engines. Engine classification, firing order. Otto, diesel and dual cycles.

**UNIT – II**

Clutch – Types and Construction – Gear Boxes, Manual and Automatic Types and Construction – Simple Floor Mounted Shift Mechanism – Over Drives – Transfer Box– Propeller shaft – Slip Joint – Universal Joints – Differential and Rear Axle – Hotchkiss Drive and Torque Tube Drive.

**UNIT – III**

Requirement of Suspension System, Types of Suspension Springs, Constructional details and characteristics of Single Leaf, Multi–Leaf spring, Coil and Torsion bar Springs, Rubber, Pneumatic and Hydro – elastic Suspension Spring Systems, Independent Suspension System, Shock Absorbers, Types and Constructional details of Leaf and Coil Springs.

**UNIT – IV**

Basic construction of chassis, Types of Chassis layout, with reference to Power Plant location and drive, various, types of frames, Types of Front Axles and Stub Axles. Steering system – Ackerman's and Davi's Steering Mechanisms - principle of steering – front end geometry – castor, camber, king pin inclination, toe-in, toe-out on turns – steering gear box – types – Over Steer and Under Steer and Power Steering.

**UNIT – V**

Types and Construction of Hydraulic Braking System, Mechanical Braking System, Pneumatic Braking System, Power–Assisted Braking System, Servo Brakes – antilock braking systems(ABS) - Wheels and Tyres.

**Text Book:**


1. Kirpal Singh, "Automobile Engineering", Vol 1 & 2, Seventh Edition, Standard Publishers, New Delhi, 1997.
2. Ramalingam. K.K., "Internal Combustion Engine Fundamentals", Scitech Publications, 2002.

## Automotive Electrical and Electronics

| Course code | 19KUA1C02 | Credits | 04 | Year | I |
|---|---|---|---|---|---|
| No. of Lecture Hours | 60 | No. of Practical Hours | -- | Sem | I |

**Unit–I**

Ohm's law- Kirchoff's Law – voltage, power, current (AC/DC), resistance, Capacitors, magnetism and electromagnetic induction, vehicle earthing – Electrical symbols – electrical safety procedures – Wiring and lighting circuits and their components – Different types of Batteries – principle, rating, testing and charging.

**UNIT-II**

Charging system and its components – Starting system and its components – Types of starter motors and its drives – Different Types ignition systems – Diagnose troubles in starting system – Carry out various tests on starter motor – Servicing of starter motor – Diagnose troubles in charging system–Carry out various tests in charging system–Servicing of alternator.

**UNIT-III**

Lighting system: insulated and earth return system, details of head light and side light, LED lighting system, head light dazzling and preventive methods – Horn, wiper system and trafficator. DC Generators and Alternators their characteristics. Control unit – cut out, electronic regulators. Spark plugs. Advance mechanisms. Electronic fuel injection systems, mono and multi point fuel injection system, Air conditioning system

**UNIT-IV**

Current trends in automotive electronic engine management system, electromagnetic compatibility, electronic dashboard instruments, onboard diagnostic system, security and warning system, Fingerprint technologies, Types of sensors, Wind screen washers & wipers, Headlight wipers & washers, Engine cooling fan motors. Electronic speed control

**UNIT-V**

Anti theft system, keyless entry system, Immobilizer system design, voice warning system, road navigation system, , Smart Cars and Traffic system, Wi–Fi cars ,blue Tooth, Applications, Vision Enhancement, Microprocessor and microcomputer controlled devices in automobiles such voice warning system, travel information system, Electronic protection system, electronic steering system.

**Text books:**

1. Automotive electrical equipments, P.L.Kholi, Tata McGraw hill publications
2. Judge. A.W., "Modern Electrical Equipment of Automobiles", chapman & Hall, London,1992

**TAMIL-II**

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

**அலகு I சைவ இலக்கியங்கள்**

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

**அலகு II வைணவ இலக்கியங்கள்**

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

**அலகு III சிற்றிலக்கியங்கள் - பிற்கால இலக்கியம்**

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

**அலகு IV இலக்கிய வரலாறு - II**

பன்னிரு திருமுறைகள்

**அலகு V இலக்கிய வரலாறு – III**

பன்னிரு ஆழ்வார்கள்

## PROFESSIONAL ENGLISH

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

**UNIT- I**

Formal and Informal Communication.

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

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

**UNIT –II**

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

**UNIT –III**

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

**UNIT –IV**

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

**UNIT –V**

**Life Skills:**

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

**Prescribed Texts :**

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

## OFFICE AUTOMATION

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

**UNIT-I**

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

**UNIT-II**

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

**UNIT-III**

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

**UNIT-IV**

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

**UNIT-V**

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

**Text Book:**

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

## Automobile Technology and Maintenance

| Course code | 19KUA2C03 | Credits | 04 | Year | I |
|---|---|---|---|---|---|
| No. of Lecture Hours | 60 | No. of Practical Hours | -- | Sem | II |

**UNIT – I**

Petrol Engine– Working principle – Major components – Petrol supply system and its components – Carburetor – Petrol pump and injectors of MPFI engine – Various sensors and its uses – Diagnosing troubles in petrol supply system.

**UNIT – II**

Diesel Engine– Working principle – Major components - Diesel supply system and its components – Individual injection system –Diesel pump – Injectors – Filters - CRDI –Air supply system – Air cleaners - Diagnosing troubles in diesel supply system.

**UNIT – III**

Cooling system and its components – Types of cooling systems – Coolants used – Antifreeze solution - Lubrication system and its components – Types of lubrication systems – Types of lubricants – Properties and SAE grade of lubricating oils – Diagnosis of troubles in cooling system and lubricating system.

**UNIT – IV**

Clutch – Types – Function – Fluid flywheel – Torque convertor – Hydraulic assisted clutch – Clutch adjustments – Gear box – Types – Functions – Constant mesh gear box – Synchromesh gear box – Manual and automatic gear boxes – Planetary gears. Transfer box – Trans axle arrangement – Propeller shaft and universal joints – Rear axle and differential – Final drives – Diagnosing troubles in clutch, gear box and rear axles.

**UNIT – V**

Steering system – Types – Components – Rack and pinion, Warm and sector and re-circulating ball and nut steering gear boxes – Electronics control of steering system – Wheel alignments. Suspension systems – Conventional suspension – Independent suspension system for front and rear wheels – Types of springs and shock absorbers – Stability control – Air suspension with electronic control – Diagnosing troubles in steering system and suspension system.

**Text Book:**


1. Kirpal Singh, "Automobile Engineering", Vol 1 & 2, Seventh Edition, Standard Publishers, New Delhi, 1997.
2. R. K. Rajput," A Text Book of Automobile Engineering". Publisher, Firewall Media, 2007.

**Automotive Electrical and Electronics**

| Course code | 19KUAT2P1 | Credits | 02 | Year | I |
|---|---|---|---|---|---|
| No. of Lecture Hours | -- | No. of Practical Hours | 60 | Sem | II |

1. Testing, charging and discharging of lead acid battery used in automobiles,
2. Testing and troubleshooting of starting system in automobiles
3. Starter motor component test
4. Testing and troubleshooting of charging system in automobiles
5. Alternator component test
6. Testing and troubleshooting of lighting system in automobiles
7. Testing of lighting conventional analog instrumentation, indicator light, warning devices
8. Testing of electrical accessories in automobiles
9. Study & testing of conventional ignition system

## Automobile Repair and maintenance Lab –I

| Course code | 18KUAT2P2 | Credits | 02 | Year | I |
|---|---|---|---|---|---|
| No. of Lecture Hours | -- | No. of Practical Hours | 60 | Sem | II |

1. Tools and instruments required for maintenance
2. Safety aspects with respect to man, machine and tools
3. General procedures for servicing and maintenance schedule
4. Minor and major tune up of gasoline and diesel engines
5. Dismantling, Studying and Assembling the piston and connecting rod assembly.
6. Dismantling, Studying and assembling the given fuel injection pump.
7. Dismantling, Studying and Assembling the given Single plate clutch assembly and to practice to adjust clutch free play.
8. Dismantling, Studying and assembling the given type of gearbox.
9. Determine the gear ratio, final transmission ratio and overall ratio for a gear box.
10. Learning to overhaul adjust the brake shoe‘and bleed the air‘in the hydraulic brake system.
11. Dismantling, studying and assembling the given steering gearbox, and also knowing to adjust the backlash and end play.
12. Measure wheel base, wheel track, ground clearance, angle of approach, minimum turning circle radius for a vehicle, steering ratio, lock-to-lock angle.

## Internship Training –I

| Course code | 18KUAT2I1 | Credits | 20 | Year | I |
|---|---|---|---|---|---|
| No. of Lecture Hours | -- | No. of Practical Hours | 1200 | Sem | II |

**Objectives:**

- To develop skills in the application of theory to practical work situations. To develop skills and techniques directly applicable to their careers. Internships will increase a student's sense of responsibility and good work habits. To expose students to real work environment experience gain knowledge in writing report in technical works/projects.
- Internship programs will increase student earning potential upon graduation. To build the strength, teamwork spirit and self-confidence in students life. To enhance the ability to improve students creativity skills and sharing ideas.
- To build a good communication skill with group of workers and learn to learn proper behavior of corporate life in industrial sector. The student will be able instilled with good moral values such as responsibility, commitment and trustworthy during their training.

**Outcomes:**

- Maintaining and troubleshooting technology.
- Writing requirements documentation.
- Performing effective and informative user testing.
- Improving problem-solving and critical thinking skills.
- Monitoring and correcting performance.
- Exercising leadership
- Behaving professionally.
- Listening effectively.
- Allocating time effectively.
- Teaching others.
- Developing individual responsibility.

## TECHNICAL COMMUNICATION

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

**UNIT-I (LISTENING)**

1) Types of Listening
2) Implications of effective Listening

**UNIT-II (SPEAKING)**

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

**UNIT-III (READING)**

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

**UNIT-IV (WRITING)**

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

**UNIT-V**

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

**PRESCRIBED TEXT:**

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

## MATHEMATICS – II

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

**Unit I:**

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

**Unit II:**

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

**Unit III:**

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

**Unit - IV**

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

**Unit - V**

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

**Text Book:**


1. Business Mathematics and Statistics by PA. Navnitham, Jai Publishers, 2012.
2. Ancillary Mathematics (Volume I ) by S. Narayanan, R. Hanumantha Rao, Manickavachagam Pillai and P. Kandaswamy, S.Viswanathan (Printers & Publishers) Pvt Ltd., 2007.

## ENVIRONMENTAL STUDIES

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

**UNIT-I**

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

Natural resources and associated problems.

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

**UNIT-II**

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

**UNIT-III**

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

**UNIT-IV**

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

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

**UNIT-V**

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

**Case studies:** Environment ethics: Issues and possible solutions.

**TEXT BOOK:**

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

## Advanced Automobile Technology

| Course code | 19KUA3C04 | Credits | 04 | Year | II |
|---|---|---|---|---|---|
| No. of Lecture Hours | 60 | No. of Practical Hours | -- | Sem | III |

**Unit – I**

Introduction to alternative fuels. - Need for alternative fuels - Availability of different alternative fuels for SI and CI engines - Various vegetable oils and their important properties -Different methods of using vegetable oils engines – Performance in engines – Performance, Emission and Combustion Characteristics in diesel engines.

**Unit – II**

Air assisted Combustion, Homogeneous charge compression ignition engines – Hydrogen, Compressed Natural Gas, Liquefied Petroleum Gas and Bio Diesel - Properties, Suitability, Merits and Demerits - Engine Modifications.

**Unit – III**

Layout of an electric vehicle, advantage and limitations, specifications, system components, electronic control system, high energy and power density batteries, hybrid vehicle, fuel cell vehicles, solar powered vehicles.

**Unit-IV**

Emission norms – EURO, USA, JAPAN and INDIA - Controlling of pollutants from engine – catalytic converters – Char coal canister control for evaporative emission – Positive crank case ventilation system for Un-burnt hydro carbon emission reduction – Fumigation EGR (Exhaust gas recirculation) – Silencer design on sound reduction in automobiles – Exhaust gas analyzer – Smoke meter – Smoke emissions from engines.

**Unit–V**

Preparation and maintenance of proper road network - National highway network with automated roads and vehicles - Satellite control of vehicle operation for safe and fast travel, GPS.

**Textbook:**


1. Heinz, "Modern Vehicle Technology" Second Edition, Bu.
2. R. K. Rajput,"A Text Book of Automobile Engineering". Publisher, Firewall Media, 2007.

**Automobile Repair and Maintenance**

| Course code | 19KUA3C05 | Credits | 05 | Year | II |
|---|---|---|---|---|---|
| No. of Lecture Hours | 75 | No. of Practical Hours | -- | Sem | III |

**Unit–I**

Maintenance – Need, importance, primary and secondary functions, policies – classification of maintenance work – vehicle insurance - basic problem diagnosis. Automotive service procedures – workshop operations – workshop manual – vehicle identification – Safety – Personnel, machines and equipment, vehicles, fire safety – First aid. Basic tools – special service tools – measuring instruments – condition checking of seals, gaskets and sealants. Scheduled maintenance services – service intervals – Towing and recovering.

**Unit–II**

Basic construction of chassis – Types of Chassis layout – with reference to Power Plant location and drive – various types of frames, Loads acting on vehicle frame – Types of Front Axles and Stub Axles – Front Wheel Geometry – Condition for True Rolling Motion – Driving Thrust and its effects, torque reactions and side thrust, Hotchkiss drive, torque tube drive, radius rods and stabilizers, Propeller Shaft, Universal Joints, Constant Velocity Universal Joints, Final drive, different types of final drive, Worm and Worm wheel, straight bevel gear, spiral bevel gear and hypoid gear final drive. Differential principle – Constructional details of differential unit, Differential housings and Non–Slip differential, differential locks.

**Unit–III**

Dismantling of engine components and cleaning – cleaning methods – visual and dimensional inspections – minor and major reconditioning of various components (like engines and fuel system, ignition systems, suspension system, Braking System, etc), reconditioning methods – engine assembly – engine tune up.– special tools used for maintenance and overhauling – Mechanical and automotive clutch and gear box servicing and maintenance and servicing of propeller shaft and differential system – Maintenance and servicing of suspension systems – Brake systems, types and servicing techniques. Steering systems – overhauling and maintenance. – Wheel alignment – computerized alignment and wheel balancing.

**Unit–IV**

Servicing and maintenance of fuel system of different types of vehicles – calibration and tuning of engine for optimum fuel supply – Maintenance of cooling systems and its components – water pump, radiator, thermostat – anticorrosion and antifreeze

additives. Lubrication maintenance – lubricating oil changing – greasing of parts. Vehicle body maintenance – minor and major repairs – Door locks and window glass actuating system maintenance.

**Unit–V**

Batteries and power storage system, power–generating systems – electrical wire harness – lighting, ignition – electronic and air conditioning systems etc – energy recuperation systems – electronic active and passive safety – comfort and convenience supplementary restraint systems (SRS) – networking and other systems – electronic control unit – ECU / ECM and sensors – Diagnosing troubles in Electrical and Electronics equipments.

**Text Books:**


1. R.Sounddaraa Rajan, "Automobile Maintenance", R.P.Publication.
2. Tim Gills, "Automotive Service: Inspection, Maintenance, Repairing", Cengage Learning, 2004

## TECHNICAL DRAWING

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

**Unit I - Geometrical construction**

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

**Unit II-Projections**

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

**Unit III- Sectional View**

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

**Unit IV -Electrical and Electronics Symbols**

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

**Unit V- Introduction to AutoCAD**

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

**Text Books:**

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

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

## PRINCIPLES OF MANAGEMENT

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

**UNIT I: INTRODUCTION TO MANAGEMENT AND ORGANIZATIONS**

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

**UNITII: PLANNING**

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

**UNIT III: ORGANISING**

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

**UNIT IV: DIRECTING**

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

**UNIT V: CONTROLLING**

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

**TEXT BOOKS:**

1. Stephen P. Robbins & Mary Coulter, " Management", Prentice Hall (India) Pvt. Ltd., 10th Edition, 2009.
2. JAF Stoner, Freeman R.E and Daniel R Gilbert "Management", Pearson Education, 6th Edition, 2004.

## விழுமியக் கல்வி (VALUE EDUCATION)

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

**நோக்கம்:**

1. சமுதாயம், இயற்கை மீதான சமூக அக்கறையை மானுட மதிப்புகளுடன் வளர்க்கச் செய்தல்
2. வாழ்வியல் நெறிகளை அறிதல்
3. காப்பியங்களில் சுட்டப்பெறும் வாழ்வியல் விழுமியங்களைக் கற்பித்தல்
4. பண்பாட்டுச் சமய விழுமியங்களை மாணவர்களுக்கு எடுத்துரைத்தல்.

**மாணவர் பெறும் திறன்:**

1. மாணவர்கள் வளமான மனநலத்தை, இலக்கிய விழுமியங்களால் பெறுதல்
2. வாழ்வியல் நெறிகளை அறிந்து பயன் பெறுவர்
3. பண்பாட்டு விழுமியங்களை அறிந்து கொள்வர்

**அலகு – ஐ**

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

**அலகு - ஐஐ**

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

**அலகு - ஐஐஐ**

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

**அலகு - ஐஏ**

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

**அலகு -ஏ**

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

**குறிப்பு தயாரிக்கப்பட்ட பாடஉரை அளிக்கப்படும்**

## Automotive Safety

| Course code | 19KUA4C06 | Credits | 04 | Year | II |
|---|---|---|---|---|---|
| No. of Lecture Hours | 60 | No. of Practical Hours | -- | Sem | IV |

**Unit I**

Introduction to automotive safety, Design of the body for safety, engine location, deceleration of vehicle inside passenger compartment, deceleration on impact with stationary and movable obstacle, concept of crumble zone, safety sandwich construction

**Unit II**

Active safety: driving safety, conditional safety, perceptibility safety, operating safety, passive safety: exterior safety, interior safety, deformation behavior of vehicle body, speed and acceleration characteristics of passenger compartment on impact.

**Unit III**

Anti-lock braking system, air bags, electronic system for activating air bags, Seat belt, regulations, automatic seat belt tightener system, collapsible steering column, tillable steering wheel, traction control systems, Roll over mitigation, , bumper design for safety

**Unit IV**

Collision warning system, causes of rear end collision, adaptive cruise control, frontal object detection, rear vehicle object detection system, object detection system with braking system interactions, Reverse sensing system, Automatic emergency braking.

**Unit V**

Steering and mirror adjustment, central locking system, Automatic parking, Garage door opening system, tyre pressure control system, speed load limiting, rain sensor system, lighting and windscreen wipers control, environment information system, In-car internet.

**Text Books:**

1. Bosch, "Automotive Handbook", 8th Edition, SAE publication, 2011.
2. Powloski. J., "Vehicle Body Engineering", Business books limited, London, 1969.
3. Ronald.K.Jurgen, "Automotive Electronics Handbook", Second Edition, McGraw-Hill Inc., 1999.

## Workshop Technology Lab –I

| Course code | 18KUAT4P3 | Credits | 03 | Year | II |
|---|---|---|---|---|---|
| No. of Lecture Hours | -- | No. of Practical Hours | 90 | Sem | IV |

1. Guidelines for human and machine safety in workshop
2. To study and prepare report on the constructional details, working principles and operation of the Automotive Clutches.
3. To study and prepare report on the constructional details, working principles and operation of the Automotive Transmission systems.
4. To study and prepare report on the constructional details, working principles and operation of the Automotive Drive Lines & Differentials.
5. To study and prepare report on the constructional details, working principles and operation of the Multi-cylinder: Diesel and Petrol Engines.
6. To study and prepare report on the constructional details, working principles and operation of the Automotive Engine Systems & Sub Systems.
7. To study and prepare report on the constructional details, working principles and operation of the Fuels supply systems.
8. To study and prepare report on the constructional details, working principles and operation of the Engine cooling & lubricating Systems.
9. To study and prepare report on the constructional details, working principles and operation of the Automotive Suspension Systems.
10. To study and prepare report on the constructional details, working principles and operation of the Automotive Steering Systems.
11. To study and prepare report on the constructional details, working principles and operation of the Automotive Brake systems
12. To study and prepare report on the constructional details, working principles and operation of the Automotive Tyres & wheels.

## Internship Training -II

| Course code | 18KUAT4I2 | Credits | 20 | Year | II |
|---|---|---|---|---|---|
| No. of Lecture Hours | -- | No. of Practical Hours | 1200 | Sem | IV |

**Objectives:**

- To develop skills in the application of theory to practical work situations. To develop skills and techniques directly applicable to their careers. Internships will increase a student's sense of responsibility and good work habits. To expose students to real work environment experience gain knowledge in writing report in technical works/projects.
- Internship programs will increase student earning potential upon graduation. To build the strength, teamwork spirit and self-confidence in students life. To enhance the ability to improve students creativity skills and sharing ideas.
- To build a good communication skill with group of workers and learn to learn proper behavior of corporate life in industrial sector. The student will be able instilled with good moral values such as responsibility, commitment and trustworthy during their training.

**Outcomes:**

- Maintaining and troubleshooting technology.
- Writing requirements documentation.
- Performing effective and informative user testing.
- Improving problem-solving and critical thinking skills.
- Monitoring and correcting performance.
- Exercising leadership
- Behaving professionally.
- Listening effectively.
- Allocating time effectively.
- Teaching others.
- Developing individual responsibility.

## TOTAL QUALITY MANAGEMENT

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

**Unit - I INTRODUCTION**

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

**Unit - II TQM PRINCIPLES**

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

**Unit - III TQM TOOLS & TECHNIQUES I**

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

**Unit - IV TQM TOOLS & TECHNIQUES II**

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

**Unit - V QUALITY SYSTEMS**

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

**TEXT BOOK**


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

## MATHEMATICS – III

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

**Unit - I**

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

**Unit - II**

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

**Unit - III**

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

**Unit - IV**

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

**Unit - V**

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

**Text Book:**


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

## INDIAN VALUES

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

**UNIT I- Character formation through Positive personality**

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

**UNIT II- Holy Mother Sarada Devi Life**

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

**UNIT III- Yoga's**

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

**UNIT IV- The inspirational life of Indian leaders**

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

**UNIT V- Importance days of India**

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

**Reference books:**


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

## Workshop Supervising and Management

| Course code | 18KUA5C07 | Credits | 05 | Year | III |
|---|---|---|---|---|---|
| No. of Lecture Hours | 75 | No. of Practical Hours | -- | Sem | V |

**Unit-I**

Basic principles of supervising - Organising time and people - Job instruction training, training for new devices and techniques - Evaluate and allotment of technician - Vehicle operation and types of process - Work scheduling, Overtime, Breakdown analysis, Cost estimation - Vehicle technical specifications of various OEM vehicular products - Relevant and up-to-date knowledge of vehicle design, manufacture, consumer, industry and trade practices - Importance of maintenance, types- preventive (scheduled) and breakdown (unscheduled) maintenance - Safety precautions in maintenance- Knowledge of free and paid service schedules, fault diagnosis, technician notes, job cards, warranty procedures, log sheets and other forms- Evaluate the information gathered from the customer report, customer satisfaction

**Unit-II**

Lubrication system - lubricating/ engine oil top up, oil changing, cleaning methods, visual and dimensional inspections, minor/major adjustments of various components - maintenance of engine accessories- air filter, battery, cooling system, electrical wiring in engine compartment. Engine tune up, top overhauling, dismantling of engine - components, cleaning, visual and dimensional inspections, minor/major reconditioning of various components, reconditioning methods, engine assembly - special tools used for maintenance/ overhauling

**Unit-III**

lubricating/ gear oil top up, oil changing, cleaning methods - visual and dimensional inspections, minor/major adjustments of various components of transmission system - Servicing and maintenance of clutch, gear box, propeller shaft, differential - Servicing and maintenance of suspension system, brake system, steering system, wheel alignment and wheel balancing

**Unit-IV**

Checking of electrical components for functioning, checking of battery, electrolyte - top up, terminal cleaning & protection methods, checking of starter motor, checking of charging systems- fan belt tension checking and adjustment - Testing methods for checking of ignitions system, lighting system - fault diagnosis and maintenance of modern electronic controls - checking and servicing of dash board instruments.

**UNIT-V**

**Motor Vehicle Act:** Schedules and sections, Registration of motor vehicles, Licensing of drivers, Control of permit, Limits of speed, traffic signs - Constructional regulations - Description of goods carrier, delivery van, tanker, tipper, Municipal - fire fighting and break down service vehicle.

**Pollution:** Pollutant formation in Engines, mechanism of HC and CO formation in four stroke and two stroke engines, NOx formation in engines - Engine Design modifications, fuel modification, evaporative emission control - EGR, air injection, thermal reactors, Water Injection, catalytic converters - Application of microprocessor in emission control- Pollution standards, driving cycles – Indian Pollution standards.

**Text book:**


1. Tim Gills, "Automotive Service: Inspection, Maintenance, Repairing", Cengage Learning, 2004
2. Kirpal Singh, "Automobile Engineering", Vol 1 & 2, Seventh Edition, Standard Publishers, New Delhi, 1997.

## Workshop Practice Lab

| Course code | 18KUAT5P4 | Credits | 03 | Year | III |
|---|---|---|---|---|---|
| No. of Lecture Hours | -- | No. of Practical Hours | 90 | Sem | V |

1. Study and layout of an automobile repair, service and maintenance shop.
2. Study and preparation of different statements/records required for the repair and maintenance works.
3. Minor and major tune up of gasoline and diesel engines.
4. Study and checking of wheel alignment - testing of camber, caster.
5. Testing kingpin inclination, toe-in and toe-out
6. Study and checking of wheel balancer
7. Study and checking of fault diagnose of MPFI Engine
8. Study, Check and change of tyre.
9. Brake adjustment and Brake bleeding.
10. Fault diagnosis and service of vehicle air conditioning system
11. Study ,check and clean to injector
12. Study and checking of air bag simulator
13. Study and layout of motor car electrical systems
14. Study, check and charge of battery

## PROFESSIONAL ETHICS AND HUMAN VALUES

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

**Unit I: Business Ethics**

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

**Unit II: Managing Ethical Organization**

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

**Unit III: Business ethics in Profession**

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

**Unit IV: Corporate Governance and social responsibility**:

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

**Unit V: Human Values**

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

**Text Book:**

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

## SAFETY ENGINEERING

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

**Unit-I Introduction**

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

**Unit-II Safety prevention**

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

**Unit-III Safety in Material Handling**

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

**Unit-IV Shopfloor Safety**

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

**Unit-V Electrical Safety**

General principles of electric safety - Preventive maintenance - Electricity & Human body - Earthing / Grounding - Safety against over voltage, extra-low and residual voltages - Hazardous areas, Electrical insulation - Energy leakage - Electrical fires

and Arc flash - Electrical causes of fire and explosion - National electrical Safety code - Safety in the use of portable tools.

**Text Books:**


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

## ENTREPRENEURSHIP DEVELOPMENT

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

**Unit I: Entrepreneurship**

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

**Unit II: Institutional Finance to Entrepreneurs**

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

**All Indian Financial Institutions:**

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

**Unit III: Institutional Setup to Entrepreneurs**

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

**Unit IV: Incentives and Subsidies of State and Central Government**

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

**Unit V: Sources of Ideas**

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

**Text Books:**


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

**Project**

| | | | | | |
|---|---|---|---|---|---|
| Course code | 18KUAT6PR | Credits | 08 | Year | III |
| No. of Lecture Hours | -- | No. of Practical Hours | 240 | Sem | VI |

**Objectives**

- The objective of the project work is to enable the students in convenient groups of not more than 5 members on a project involving theoretical and experimental studies related to the branch of study. Every project work shall have a guide who is the member of the faculty of the institution. The students to receive the directions from the guide, on library reading, laboratory work, computer analysis or field work as assigned by the guide and also to present in periodical seminars on the progress made in the project.
- Each student shall finally produce a comprehensive report covering background information, literature survey, problem statement, project work details and conclusion. This final report shall be typewritten form as specified in the guidelines.
- The continuous assessment shall be made as prescribed by college regulations

**OUTCOMES:**

- On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.

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## Internship Training -III

| Course code | 18KUAT6I3 | Credits | 20 | Year | III |
|---|---|---|---|---|---|
| No. of Lecture Hours | -- | No. of Practical Hours | 1200 | Sem | VI |

**Objectives:**

- To develop skills in the application of theory to practical work situations. To develop skills and techniques directly applicable to their careers. Internships will increase a student's sense of responsibility and good work habits. To expose students to real work environment experience gain knowledge in writing report in technical works/projects.
- Internship programs will increase student earning potential upon graduation. To build the strength, teamwork spirit and self-confidence in students life. To enhance the ability to improve students creativity skills and sharing ideas.
- To build a good communication skill with group of workers and learn to learn proper behavior of corporate life in industrial sector. The student will be able instilled with good moral values such as responsibility, commitment and trustworthy during their training.

**Outcomes:**

- Maintaining and troubleshooting technology.
- Writing requirements documentation.
- Performing effective and informative user testing.
- Improving problem-solving and critical thinking skills.
- Monitoring and correcting performance.
- Exercising leadership
- Behaving professionally.
- Listening effectively.
- Allocating time effectively.
- Teaching others.
- Developing individual responsibility.

## SCHEME OF EXAMINATION
## (For General Education and Vocational Education Component)

**General Rule of Examination:**

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

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

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

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

**Continuous Internal Assessment:**

Two CIA tests conducted for each paper during each semester.

**CIA for General and Vocational component (Theory):**

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

**Internal Marks (Theory):**

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

**Internal Marks (Practical):**

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

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

**Internal Marks (Internship Training):**

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

## QUESTION PAPER PATTERN

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

**CIA TEST – I**
**(Unit 1 & 2 only)**

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

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

**CIA TEST – II**
**(Unit 3, 4 & 5 only)**

**Time: 1½ Hour** **Max. Marks: 25**

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

**SEMESTER EXAMINATION**
**(All Five Units)**

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

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