

DEPARTMENT OF MECHATRONICS ENGINEERING
CPAT ADDITIONAL COURSES SYLLABUS
THIRD SEMESTER

| Subject Code | Subject | Hours per week |
|--------------|----------------------------|----------------|
| SP3.1 | Basic Electronic Soldering | 2 |
| SP3.2 | Welding | 2 |

FOURTH SEMESTER

| Subject Code | Subject | Hours per week |
|--------------|---------------------------|----------------|
| SP4.1 | Sustainable Manufacturing | 2 |

FIFTH SEMESTER

| Subject Code | Subject | Hours per week |
|--------------|---------------------------------------|----------------|
| SP5.1 | Mobile robot using Embedded C | 2 |
| SP5.2 | Basic Pneumatics & Electro-Pneumatics | 2 |

SIXTH SEMESTER

| Subject Code | Subject | Total Hours |
|--------------|------------------------|-------------|
| SP6.1 | Professional Practices | 2 |
| SP6.2 | Industrial Automation | 2 |

Basic Electronic Soldering

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|--------------------|-----------------------------------|---------------|---|
| PROGRAM | Mechatronics Engineering | DIPLOMA: | DMTE – Sandwich |
| COURSE: | Basic Electronic Soldering | SEMESTER: | III |
| COURSE CODE: | SP3.1 | COURSE LEADER | T.Narendiran |
| REGULATION: | Additional Course | COURSE TYPE | ✓ Core / Elective / Breadth / S&H |
| COURSE AREA/DOMAIN | Mechatronics Engineering | CONTACT HOURS | 2 hours/week. |

SYLLABUS:

| EX.NO | DETAILS | HOURS |
|--------------------|--|---------------|
| 1 | Introduction to basic electronic components and objective of Soldering | 2 hours /week |
| 2 | Introduction to soldering techniques | |
| 3 | Tinning process of multi stand wire | |
| 4 | Joining of two wires | |
| 5 | Loop joint using tinning process | |
| 6 | Lug joint soldering | |
| 7 | IC base | |
| 8 | Basic electronics components | |
| 9 | PCB design and desoldering | |
| 10 | Mini project. | |
| TOTAL HOURS | | 40 hrs |

COURSE OUTCOMES:

- Understand and apply the soldering techniques to construct various electronics circuits.
- Demonstrate competency in different soldering techniques.
- Perform soldering and de-soldering on printed circuit boards(PCBs)
- Design and develop of mini project.

WELDING

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|---------------------|---------------------------------|----------------|--|
| PROGRAM | Mechatronics Engineering | DIPLOMA: | DMTE – Sandwich |
| COURSE: | WELDING | SEMESTER: | III |
| COURSE CODE: | SP 3.2 | COURSE LEADER | Ramamoorthi. P |
| REGULATION: | Additional Course | COURSE TYPE: | Core / Elective / Breadth / S&H |
| COURSE AREA/DOMAIN: | Mechanical Engineering | CONTACT HOURS: | 2 hours / week. |

SYLLABUS:

Introduction to manufacturing processes- Introduction and demonstrate welding process- Arc & Gas welding equipments and types joints- Arc welding Practice- Butt joint , Lapp joint , T joint- Gas welding Practice- Butt joint , Lapp joint , T joint- Resistance welding , TIG and MIG- Welding hazards, Fire & explosion prevention- Revision and test

COURSE OUTCOMES:

- Understand and identification of manufacturing process
- Identify the various tools and their applications used in welding
- Properly set up and use oxyacetylene cutting and welding equipment.
- Understand and identification the types welding defects
- Able to set up welding equipment using proper polarity, amperage setting, voltage setting and electrode for welding process being performed

MOBILE ROBOT USING EMBEDDED C

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|---------------------|---------------------------------|----------------|--|
| PROGRAM | Mechatronics Engineering | DIPLOMA: | DMTE – Sandwich |
| COURSE: | Embedded C Programming | SEMESTER: | V |
| COURSE CODE: | SP5.1 | COURSE LEADER | V.Valarmathy |
| REGULATION: | Additional Course | COURSE TYPE: | Core / Elective / Breadth / S&H |
| COURSE AREA/DOMAIN: | Mechatronics Engineering | CONTACT HOURS: | 2 hours/week. |

| SYLLABUS |
|---|
| Major components of a robot - Ports in Firebird V Robot - Purpose of Ports – Port Programming – Embedded C Language Concepts - I / O Interfacing - Buzzer Program- BAR LED Program - Motion Control – Sensor Interfacing - LCD Interfacing – Velocity Control – Mini Projects |

COURSE OUTCOMES:

- Understand I/O devices of robot and develop Port programming
- Design, develop and execute programs using embedded C Language
- Design and develop programs to perform I/O interfacing
- Develop programs for motion control and velocity control of robots
- Design and develop real time projects in Embedded systems

Basic Pneumatics and Electro-Pneumatics

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|--------------------|---|---------------|--|
| PROGRAM | Mechatronics Engineering | DIPLOMA: | DMTE – Sandwich |
| COURSE: | Basic Pneumatics & Electropneumatics | SEMESTER: | V |
| COURSE CODE: | SP5.2 | COURSE LEADER | Kalidoss K ✓ |
| REGULATION: | Additional Course | COURSE TYPE | Core / Elective / Breadth / S&H |
| COURSE AREA/DOMAIN | Mechatronics Engineering | CONTACT HOURS | 2 hours/week. |

SYLLABUS:

Pneumatics

Objectives of low cost automation – Introduction to Pneumatics Basic principles of air preparation and distribution unit – Description of structure of pneumatic device and valves – ISO 1219 symbols for Pneumatic components – Safety procedures and industrial standards - Use of DCV, FCV and PCV – Systematic approach of pneumatic circuit design – Realization of logical functions in pneumatic systems – Identification and troubleshooting of faults.

Electropneumatics

Basic concepts of using Electro-Pneumatics in automation – ISO Electrical symbols – Construction of electro-pneumatic circuits – Solenoid valve construction and working – Relays, Timers – Principle of PE converters – Multi-position cylinder applications – Multi cylinder applications – Use of magnetic reed switches, sensors.

COURSE OUTCOMES:

- Understand the basic concepts of Pneumatic system
- Design circuits for various industrial applications

PROFESSIONAL PRACTICES

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|---------------------|---------------------------------|----------------|------------------------|
| PROGRAM | Mechatronics Engineering | DIPLOMA: | DMTE – Sandwich |
| COURSE: | Professional practices | SEMESTER: | VI |
| COURSE CODE: | SP 6.1 | COURSE LEADER | Indumathy S |
| REGULATION: | Additional Course | COURSE TYPE: | Career Guidance |
| COURSE AREA/DOMAIN: | Mechatronics Engineering | CONTACT HOURS: | 2 hours/week. |

SYLLABUS:

Group discussion and Presentation (Any two topics related to the course) –
 Industrial visits (Structured Industrial visits be arranged and the report of the same should be submitted by the individual student , to form a part of the team work) –
 Expert Lectures (Lectures by professional / Industrial expert be organized , students shall submit the report on each lecture.

COURSE OUTCOMES:

- Acquire information from different sources
- Preparing notes for given topic
- Presenting seminars for given topics
- Interaction with peers to share their ideas
- Preparing a report on industrial visit / expert lectures

Industrial Automation

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|--------------------|---------------------------------|---------------|--|
| PROGRAM | Mechatronics Engineering | DIPLOMA: | DMTE – Sandwich |
| COURSE: | Industrial Automation | SEMESTER: | VI & VII |
| COURSE CODE: | SP6.2 | COURSE LEADER | Kalidoss K ✓ |
| REGULATION: | Additional Course | COURSE TYPE | Core / Elective / Breadth / S&H |
| COURSE AREA/DOMAIN | Mechatronics Engineering | CONTACT HOURS | 2 hours/week. |

SYLLABUS

Introduction-Safety and standard operating procedure for pneumatic and hydraulic systems-Advantages and Limitations-Design and simulation of pneumatic and hydraulic systems for various industrial application –Selection of appropriate components- Construction of pneumatic and hydraulic circuits-Troubleshooting the circuits-Maintenance of pneumatic and hydraulic systems-Low cost automation using Hard wired logic control and PLC-PLC Programming-Interfacing I/O's with PLC.

COURSE OUTCOMES:

- Understand the basic concepts of hard wired logic systems and programmable logic system
- Design circuits for various industrial applications
- Programming PLC for industrial applications