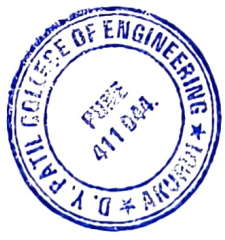
**Savitribai Phule Pune University, Pune**
**SE (Robotics & Automation)**
**2019 Course**
**(With effect from Academic Year 2020-21)**

**Semester-III**

| Course Code | Course Name | Teaching Scheme (Hours/Week) | | | Examination Scheme and Marks | | | | | | Credit | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Theory | Practical | Tutorial | IN-Sem | End-Sem | TW | PR | OR | Total | TH | PR | TUT | Total |
| 207007 | Engineering Mathematics-III | 3 | | 1 | 30 | 70 | 25 | | | 125 | 3 | | 1 | 4 |
| 211501 | Industrial Electronics and Electrical Technology | 3 | | | 30 | 70 | | | | 100 | 3 | | | 3 |
| 211082 | Strength of Materials | 3 | | | 30 | 70 | | | | 100 | 3 | | | 3 |
| 211502 | Manufacturing Technology | 3 | | | 30 | 70 | | | | 100 | 3 | | | 3 |
| 211503 | Materials Science and Engineering Metallurgy | 3 | | | 30 | 70 | | | | 100 | 3 | | | 3 |
| 211504 | Industrial Electronics and Electrical Technology Lab | | 2 | | | | 25 | | | 25 | | 1 | | 1 |
| 211086 | Strength of Materials Lab | | 2 | | | | | | 25 | 25 | | 1 | | 1 |
| 211505 | Manufacturing Technology Lab | | 2 | | | | | 50 | | 50 | | 1 | | 1 |
| 211506 | Materials Science and Engineering Metallurgy Lab | | 2 | | | | | | 25 | 25 | | 1 | | 1 |
| 211507 | C Programming Lab | | 4 | | | | 50 | | | 50 | | 2 | | 2 |
| 211090 | Mandatory Audit Course 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | | **15** | **12** | **1** | **150** | **350** | **100** | **50** | **50** | **700** | **15** | **6** | **1** | **22** |



## Mandatory Audit Course 3: Road Safety

## 211090

Road transport remains the least safe mode of transport, with road accidents representing the main cause of death of people. The boom in the vehicle population without adequate road infrastructure, poor attention to driver training and unsatisfactory regulation has been responsible for increase in the number of accidents. India's vehicle population is negligible as compared to the World statistics; but the comparable proportion for accidents is substantially large.

The need for stricter enforcement of law to ensure greater safety on roads and an environment-friendly road transport operation is of paramount importance. Safety and security are growing concerns for businesses, governments and the traveling public around the world, as also in India. It is, therefore, essential to take new initiatives in raising awareness, skill and knowledge of students as one of the ibid stake holders who are expected to follow the rules and policies of the government in order to facilitate safety of individual and safe mobility of others.

**Course Contents:**

1. Existing Road Transport Scenario
2. Accident Causes & Remedies
3. Road Accident Investigation & Investigation Methods
4. Vehicle Technology – CMVR & Road Safety
5. Regulatory / Legislative Provisions for Improving Road Safety
6. Behavioral Training for Drivers for Improving Road Safety
7. Road Safety Education
8. Road Engineering Measures for Improving Road Safety

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**Semester-IV**

| Course Code | Course Name | Teaching Scheme (Hours/Week) | | | Examination Scheme and Marks | | | | | | Credit | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Theory | Practical | Tutorial | IN-Sem | End-Sem | TW | PR | OR | Total | TH | PR | TUT | Total |
| 211508 | Industrial Engineering and Management | 3 | | | 30 | 70 | | | | 100 | 3 | | | 3 |
| 211509 | Control System Engineering | 3 | | | 30 | 70 | | | | 100 | 3 | | | 3 |
| 211510 | Design of Machine Elements | 3 | | | 30 | 70 | | | | 100 | 3 | | | 3 |
| 211511 | Metrology and Quality Assurance | 3 | | | 30 | 70 | | | | 100 | 3 | | | 3 |
| 211512 | Computer Graphics for Robotics | 3 | | | 30 | 70 | | | | 100 | 3 | | | 3 |
| 211513 | Control System Engineering Lab | | 2 | | | | 25 | 25 | | 50 | | 1 | | 1 |
| 211514 | Design of Machine Elements Lab | | 2 | | | | | | 25 | 25 | | 1 | | 1 |
| 211515 | Metrology and Quality Assurance Lab | | 2 | | | | | 25 | | 25 | | 1 | | 1 |
| 211516 | Computer Graphics for Robotics Lab | | 2 | | | | 25 | | | 25 | | 1 | | 1 |
| 211517 | Robot Operating System | | 2 | | | | | | 25 | 25 | | 1 | | 1 |
| 211099 | Project Based Learning | | 4 | | | | 50 | | | 50 | | 2 | | 2 |
| 211100 | Mandatory Audit Course 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Total | **15** | **14** | **0** | **150** | **350** | **100** | **50** | **50** | **700** | **15** | **7** | **0** | **22** |

**Abbreviations:**
TH : Theory TW : Term Work PR : Practical
OR : Oral TUT : Tutorial

## Mandatory Audit Course 4

## 211100

Students should complete one of the NPTEL courses listed below.

**NPTEL Courses:**

1. Developing soft skills and personality, T. Ravichandran, IIT Kanpur
   https://swayam.gov.in/nd1_noc20_hs43/preview
2. Innovation by Design, By Prof. B.K. Chakravarthy, IIT Bombay
   https://swayam.gov.in/nd1_noc20_de08/preview
3. Design Thinking - A Primer, By Prof. Ashwin Mahalingam, Prof. Bala Ramadurai, IIT Madras
   https://swayam.gov.in/nd1_noc20_mg38/preview
4. Technical English for Engineers, By Prof. Isha Iqbal, IIT Madras
   https://swayam.gov.in/nd1_noc20_hs56/preview
5. Ethics in Engineering Practice, Susmita Mukhopadhyay, IIT Kharagpur
   https://swayam.gov.in/explorer?searchText=Ethics%20in%20Engineering%20Practice

Industrial visit/expert lectures should be organized for the audit courses undertaken by students. The group of students should be allocated to faculty members to keep the track of students' progress. The performance of the students may be evaluated using any appropriate method.