Savitribai Phule Pune University, Pune SE (Robotics & Automation) 2019 Course (With effect from Academic Year 2020-21)															
			5	Seme	ster-II	I									
Course Code	Course Name Teaching Scheme (Hours/Wee				Examination Scheme and Marks							Credit			
		Theory	Practical	Tutorial	IN-Sem	End-Sem	ΤW	PR	OR	Total	ΗT	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	

Course Name ndustrial Engineering and Management Control System Engineering Design of Machine	5	Lactical	ie		End-Sem End-Sem	nation Ma	Sche rks ¥d	eme a	Total	HT	PR C	fredit LOL	Total
Management Control System Engineering	3	Practical	Tutorial		End-Sem	ΜT	PR	OR	Total	HT	PR	TUT	Total
Management Control System Engineering				30									
Engineering	3			50	70				100	3			3
Design of Machine				30	70				100	3			3
Elements	3			30	70				100	3			3
Metrology and Quality Assurance	3			30	70				100	3			3
Computer Graphics for Robotics	3			30	70				100	3			3
Control System Engineering Lab		2				25	25		50		1		1
Design of Machine Elements Lab		2						25	25		1		1
Metrology and Quality Assurance Lab		2					25		25		1		1
Computer Graphics for Robotics Lab		2				25			25		1		1
Robot Operating System		2						25	25		1		1
Project Based Learning		4				50			50		2		2
Mandatory Audit Course 4	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	15	14	0	150	350	100	50	50	700	15	7	0	22
	Aetrology and Quality Assurance Computer Graphics for Cobotics Control System Engineering Lab Design of Machine Clements Lab Aetrology and Quality Assurance Lab Computer Graphics for Cobotics Lab Computer Graphics for Cobotics Lab Cobot Operating System Project Based Learning Mandatory Audit Course 4 Total	Metrology and Quality Assurance3Computer Graphics for Robotics3Control System3Engineering Lab2Design of Machine2Elements Lab4Metrology and Quality Assurance Lab3Computer Graphics for Robotics Lab3Robot Operating System3Project Based Learning Mandatory Audit Course 4-Total15Ins: TH : TheoryTW : Ter	Metrology and Quality Assurance3Computer Graphics for Robotics3Control System Engineering Lab2Design of Machine Elements Lab2Metrology and Quality Assurance Lab2Computer Graphics for Robotics Lab2Computer Graphics for Robot Operating System2Computer Torial Total1511514Coms: TH : TheoryTW : Term Work	Aetrology and Quality Assurance33Computer Graphics for Robotics32Control System Engineering Lab22Design of Machine Elements Lab22Metrology and Quality Assurance Lab22Computer Graphics for Robotics Lab24Computer Graphics for Robot Operating System24Mandatory Audit Course 4Total15140Ins: TH : TheoryTW : Term Work	Metrology and Quality Assurance330Computer Graphics for Robotics330Control System Engineering Lab230Design of Machine Elements Lab230Metrology and Quality Assurance Lab230Computer Graphics for Robotics Lab230Computer Graphics for Robot Operating System230Project Based Learning Mandatory Audit Course 4Total15140150Ins: TH : TheoryTW : Term WorkPR	Aetrology and Quality Assurance33070Computer Graphics for Robotics33070Control System Engineering Lab21Design of Machine Elements Lab21Metrology and Quality Assurance Lab21Computer Graphics for Robotics Lab21Toject Based Learning Mandatory Audit Course 4Total15140150ItsTH : TheoryTW : Term WorkPR : Pract	Metrology and Quality Assurance33070Assurance33070Computer Graphics for Robotics33070Control System Engineering Lab2225Design of Machine Elements Lab2225Design of Machine Elements Lab2225Computer Graphics for Robotics Lab2225Computer Graphics for Robotics Lab2225Cobotics Lab2225Robot Operating System2225Project Based Learning450Mandatory Audit Course 4Total15140150350Ins: TH : TheoryTW : Term WorkPR : Practical	Aetrology and Quality Assurance330701Computer Graphics for Robotics330701Control System Engineering Lab212525Design of Machine Elements Lab2112Metrology and Quality Assurance Lab21225Computer Graphics for Robotics Lab212525Computer Graphics for Robotics Lab212525Computer Graphics for Robotics Lab212525Cobot Operating System22502Project Based Learning Mandatory Audit Course 4Total1514015035010050ms: TH : TheoryTW : Term WorkPR : Practical	Aetrology and Quality Assurance330701Computer Graphics for cobotics330701Control System Engineering Lab2225Design of Machine Elements Lab2125Aetrology and Quality Assurance Lab2225Computer Graphics for cobotics Lab2225Computer Graphics for cobotics Lab2225Computer Graphics for cobotics Lab22525Computer Graphics for cobotics Lab22550Computer Graphics for cobotics Lab22550Computer Graphics for cobotics Lab22550Conject Based Learning Mandatory Audit Course 4Total1514015035010050ms: TH : TheoryTW : Term WorkPR : Practical	Aetrology and Quality Assurance33070100Computer Graphics for Robotics33070100Control System Engineering Lab2252550Design of Machine Elements Lab22252525Metrology and Quality Assurance Lab22252525Computer Graphics for Robotics Lab22252525Computer Graphics for Robot Operating System22252525Conject Based Learning Andatory Audit Course 4Total151401503501005050700ms: TH : TheoryTW : Term WorkPR : Practical222222	Aetrology and Quality Assurance330701003Computer Graphics for Robotics330701003Control System Engineering Lab2252550Design of Machine Elements Lab222525Metrology and Quality Assurance Lab222525Computer Graphics for Robotics Lab2252525Computer Graphics for Robotics Lab2252525Computer Graphics for Robotics Lab2252550Conject Based Learning Mandatory Audit Course 4Total151401503501005050Inst TH : TheoryTW : Term WorkPR : Practical	Aetrology and Quality Assurance330701003Computer Graphics for Robotics330701003Control System Engineering Lab22525501Design of Machine Elements Lab222525501Design of Machine Elements Lab2225251Design of Machine Elements Lab2225251Metrology and Quality Assurance Lab225251Computer Graphics for Robotics Lab225251Cobot Operating System2225502Project Based Learning450502Mandatory Audit Course 4Total151401503501005050700157ms: TH : TheoryTW : Term WorkPR : Practical2222333	Aetrology and Quality Assurance3307010031Computer Graphics for tobotics3307010031Control System Engineering Lab22525501Design of Machine Elements Lab2225251Metrology and Quality Assurance Lab2225251Computer Graphics for tobotics Lab225251Computer Graphics for tobotics Lab225502Computer Graphics for tobotics Lab250502Computer Graphics for tobotics Lab3105050700Total151401503501005050700The rest for total15140150<

# 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

## 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 lobal, 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.