

**List and description of courses and Activities which address the Professional Ethics, Gender, Human Values, Environment and Sustainability into the Curriculum.**

Sr. No	Cost cutting Issues	Course	Program	Additional Activities
1	Professional Ethics	Professional Communication and Ethics-I, Business Communication and Ethics, Project Management, FE Induction Program	All Branches	Internship Expo by TEDxCRCE
		Industrial Relations and Human Resource Management	Production Engineering	Resume Building Workshop by TEDxCRCE
		Cyber Security and Laws, Embedded Systems and Real Time Operating System	Electronics Engineering	Lecture on - Innovation and IPR Process by Dr. S N Teli organized by IPR Cell in association with IIC-Fr.CRCE
		Software Engineering, Cryptography and System Security, Advance System Security & Digital Forensics	Computer Engineering	Mentoring Towards Preparation For Placements & Future Careers In I.T. Industry organised by placement cell
		Software Engineering with Project Management, Cryptography and Network Security, Infrastructure Security, Management Information System	Information Technology	Life After Engineering Counseling by Rotract
				WHAT'S YOUR GENRE? By Rotract
				Webinar Series on Personality Development by NSS
2	Gender			International Women's day celebration by WIE
				Best Allrounder Award for Male and Female Students
				Women Development Cell
				Event on Women Empowerment Catalyst by NSS
3	Human Values	FE Induction Program	All Branches	Yoga Webinar by Khush Panchal by NSS

				Online Defense Workshop by NSS
				Global Freedom Summit by NSS
				Awareness on Anti Human Trafficking by NSS
				Mental Health and Welfare Webinar by NSS
				Road Safety Awareness and Welfare Webinar by NSS
				Webinar on Right to Information by NSS
				Drive on Feeding Stray Animals by NSS
				Session on Child Labor by NSS
				TEDxCRCE Talks Shifting Gears
				Heart & Sole Run 4 by Rotract
				Finding your Identity by Rotract
				Red Wall Projecr in association with Sahodari Foundation by Rotract
				Jaise bhi hai acche hai' mental health awareness by Rotract
				Break the Stigma interview series on mental health by Rotract
4	Environment and Sustainability	Sustainable Manufacturing, Product Design and Industrial Marketing	Production Engineering	Personal Sustainability Webinar by NSS
		Electronics Product Design, Embedded Systems and Real Time Operating System	Electronics Engineering	Carbon Footprint Webinar by NSS
				Coastal Cleanup Day Webinars by NSS
				Recycle Fest NSS
				Climate Change Webinar by NSS
				Documentary on Sustainability by NSS

**Supporting Documents for Curriculum and Activities related to Professional Ethics, Gender Equity, Human Values and Environment and Sustainability (A.Y. 2019-20)**

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4.6	Climate Change Webinar by NSS	
4.7	Documentary on Sustainability by NSS	

### **Professional Ethics**

- Courses Offered in Curriculum
- Internship Expo by TEDxCRCE
- Resume Building Workshop by TEDxCRCE
- Lecture on - Innovation and IPR Process by Dr. S N Teli organized by IPR Cell in association with IIC-Fr.CRCE
- Mentoring Towards Preparation For Placements & Future Careers In I.T. Industry organised by placement cell
- Life After Engineering Counseling by Rotract
- WHAT'S YOUR GENRE? By Rotract
- Webinar Series on Personality Development by NSS

**Semester II**

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned				
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total	
FEC201	Engineering Mathematics-II	3	--	1*	3	--	1	4	
FEC202	Engineering Physics-II	2	--	--	2	--	--	2	
FEC203	Engineering Chemistry-II	2	--	--	2	--	--	2	
FEC204	Engineering Graphics	2	--	--	2	--	--	2	
FEC205	C programming	2	--	--	2	--	--	2	
FEC206	Professional Communication and Ethics- I	2	--	--	2	--	--	2	
FEL201	Engineering Physics-II	--	1	--	--	0.5	--	0.5	
FEL202	Engineering Chemistry-II	--	1	--	--	0.5	--	0.5	
FEL203	Engineering Graphics	--	4	--	--	2	--	2	
FEL204	C programming	--	2	--	--	1	--	1	
FEL205	Professional Communication and Ethics- I	--	2	--	--	1	--	1	
FEL206	Basic Workshop practice-II	--	2	--	--	1	--	1	
<b>Total</b>		<b>13</b>	<b>12</b>	<b>01</b>	<b>13</b>	<b>06</b>	<b>01</b>	<b>20</b>	
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract./oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test1	Test 2	Avg.					
FEC201	Engineering Mathematics-II	20	20	20	80	3	25	--	125
FEC202	Engineering Physics-II	15	15	15	60	2	--	--	75
FEC203	Engineering Chemistry-II	15	15	15	60	2	--	--	75
FEC204	Engineering Graphics	15	15	15	60	3	--	--	75
FEC205	C programming	15	15	15	60	2	--	--	75
FEC206	Professional Communication and Ethics- I	10	10	10	40	2	--	--	50
FEL201	Engineering Physics-II	--	--	--	--	--	25	--	25
FEL202	Engineering Chemistry-II	--	--	--	--	--	25	--	25
FEL203	Engineering Graphics	--	--	--	--	--	25	50	75
FEL204	C programming	--	--	--	--	--	25	25	50
FEL205	Professional Communication and Ethics- I	--	--	--	--	--	25	--	25
FEL206	Basic Workshop practice-II	--	--	--	--	--	50	--	50
<b>Total</b>		--	--	<b>90</b>	<b>360</b>	--	<b>200</b>	<b>75</b>	<b>725</b>

\* May be conducted batch-wise

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned				
		Theory	Pract.	Tut.	Theory	Tut.	Pract.	Total	
FEC206	Professional Communication and Ethics- I	2	--	--	2	--	--	2	
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract. /oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test1	Test 2	Avg.					
FEC206	Professional Communication and Ethics- I	10	10	10	40	2	--	--	50

### Objectives

1. To demonstrate the fundamental concepts of interpersonal and professional communication.
2. To encourage active listening with focus on content, purpose, ideas and tone.
3. To facilitate fluent speaking skills in social, academic and professional situations.
4. To train in reading strategies for comprehending academic and business correspondence.
5. To promote effective writing skills in business, technology and academic arenas.
6. To inculcate confident personality traits along with grooming and social etiquettes.

### Outcomes: Learners will be able to understand how to...

1. Eliminate barriers and use verbal/non-verbal cues at social and workplace situations.
2. Employ listening strategies to comprehend wide-ranging vocabulary, grammatical structures, tone and pronunciation.
3. Prepare effectively for speaking at social, academic and business situations.
4. Use reading strategies for faster comprehension, summarization and evaluation of texts.
5. Acquire effective writing skills for drafting academic, business and technical documents.
6. Successfully interact in all kinds of settings, displaying refined grooming and social skills.

Module	Detailed Contents	Hrs.
1	<b>FUNDAMENTALS OF COMMUNICATION</b>	12
	<b>1.1. Introduction to Theory of Communication</b> <ul style="list-style-type: none"> <li>● Definition</li> <li>● Objectives</li> <li>● Postulates/Hallmarks</li> <li>● The Process of Communication</li> <li>● Organizational Communication <ul style="list-style-type: none"> <li>○ Formal (Upward, Downward and Horizontal)</li> <li>○ Informal (Grapevine)</li> </ul> </li> </ul> <b>1.2. Methods of Communication</b> <ul style="list-style-type: none"> <li>● Verbal (Written &amp; Spoken)</li> <li>● Non-verbal <ul style="list-style-type: none"> <li>○ Non-verbal cues perceived through the five senses: (Visual, Auditory, Tactile, Olfactory and Gustatory cues)</li> <li>○ Non-verbal cues transmitted through the use of: (The Body, Voice, Space, Time and Silence)</li> </ul> </li> </ul> <b>1.3. Barriers to Communication</b>	

	<ul style="list-style-type: none"> <li>● Mechanical/External</li> <li>● Physical/Internal</li> <li>● Semantic &amp; Linguistic</li> <li>● Psychological</li> <li>● Socio-Cultural</li> </ul> <p><b>1.4. Communication at the Workplace</b></p> <ul style="list-style-type: none"> <li>● Corporate Communication - Case Studies</li> <li>● Listening Tasks with Recordings and Activity Sheets</li> <li>● Short Speeches as Monologues <ul style="list-style-type: none"> <li>○ Informative Speeches that Center on People, Events, Processes, Places, or Things</li> <li>○ Persuasive Speeches to Persuade, Motivate or Take Action</li> <li>○ Special Occasion Speeches for Ceremonial, Commemorative, or Epideictic purposes</li> </ul> </li> <li>● Pair-work Conversational Activities (Dialogues)</li> <li>● Short Group Presentations on Business Plans</li> </ul>	
2	<p><b>VERBAL APTITUDE FOR EMPLOYMENT</b></p> <p><b>2.1. Vocabulary Building</b></p> <ul style="list-style-type: none"> <li>● Root words (Etymology)</li> <li>● Meaning of Words in Context</li> <li>● Synonyms &amp; Antonyms</li> <li>● Collocations</li> <li>● Word Form Charts</li> <li>● Prefixes &amp; Suffixes</li> <li>● Standard Abbreviations</li> </ul> <p><b>2.2. Grammar</b></p> <ul style="list-style-type: none"> <li>● Identifying Common Errors <ul style="list-style-type: none"> <li>○ Subject - Verb Agreement</li> <li>○ Misplaced Modifiers</li> <li>○ Articles</li> <li>○ Prepositions</li> </ul> </li> <li>● Tautologies</li> <li>● Pleonasm (Redundancies)</li> <li>● Idioms</li> <li>● Cliches</li> </ul>	02
3	<p><b>DEVELOPING READING AND WRITING SKILLS</b></p> <p><b>3.1. Reading Comprehension</b></p> <ul style="list-style-type: none"> <li>● Long Passages</li> <li>● Short Passages</li> <li>● MCQs on Inferential Questions with 4 Options</li> </ul> <p><b>3.2. Summarization of reading passages, reports, chapters, books</b></p> <ul style="list-style-type: none"> <li>● Graphic Organizers for Summaries <ul style="list-style-type: none"> <li>○ Radial Diagrams like Mind Maps</li> <li>○ Flow Charts</li> <li>○ Tree Diagrams</li> <li>○ Cyclic Diagrams</li> <li>○ Linear Diagrams like Timelines</li> <li>○ Pyramids</li> <li>○ Venn Diagrams</li> </ul> </li> <li>● Point-form Summaries</li> <li>● One-sentence Summaries of Central Idea</li> </ul> <p><b>3.3. Paraphrasing</b></p> <ul style="list-style-type: none"> <li>● Understanding Copyrights</li> <li>● Running a Plagiarism Check on Paraphrased Passages</li> <li>● Generating Plagiarism Reports</li> </ul>	02

	<ul style="list-style-type: none"> <li>● Basic APA and MLA Referencing Style and Format</li> </ul>	
4	<p><b>BUSINESS CORRESPONDENCE</b></p> <p><b>4.1. Seven Cs of Business Correspondence</b></p> <ul style="list-style-type: none"> <li>● Completeness</li> <li>● Conciseness</li> <li>● Consideration</li> <li>● Concreteness</li> <li>● Clarity</li> <li>● Courtesy</li> <li>● Correctness</li> </ul> <p><b>4.2. Parts of a Formal Letter and Formats</b></p> <ul style="list-style-type: none"> <li>● Parts/Elements of a Formal Letter <ul style="list-style-type: none"> <li>○ Letterheads and/or Sender's Address</li> <li>○ Dateline</li> <li>○ Inside Address</li> <li>○ Reference Line (Optional)</li> <li>○ Attention Line (Optional)</li> <li>○ Salutation</li> <li>○ Subject Line</li> <li>○ Body</li> <li>○ Complimentary Close</li> <li>○ Signature Block</li> <li>○ Endosures/Attachments</li> </ul> </li> <li>● Complete/Full Block Format</li> </ul> <p><b>4.3. Emails</b></p> <ul style="list-style-type: none"> <li>● Format of Emails</li> <li>● Features of Effective Emails</li> <li>● Language and style of Emails</li> </ul> <p><b>4.4. Types of Letters in Both Formal Letter Format and Emails</b></p> <ul style="list-style-type: none"> <li>● Claim &amp; Adjustment Letters</li> <li>● Request/Permission Letters</li> <li>● Sales Letters</li> </ul>	06
5	<p><b>BASIC TECHNICAL WRITING</b></p> <p><b>5.1. Introduction</b></p> <ul style="list-style-type: none"> <li>● What is Technical Writing?</li> <li>● Importance and Principles of Technical Writing</li> <li>● Difference between Technical Writing &amp; Literary Writing</li> <li>● Framing Definitions</li> <li>● Difference between Technical Description &amp; Instructions</li> </ul> <p><b>5.2. Description of a Technical Object</b></p> <ul style="list-style-type: none"> <li>● Definition</li> <li>● Diagram</li> <li>● Discussion of Parts/Characteristics</li> </ul> <p>Working</p> <p><b>5.3. Writing User Instructions</b></p> <ul style="list-style-type: none"> <li>● User Instructions</li> <li>● Special Notices (Note, Warning, Caution and Danger)</li> <li>● Styles of Presentation <ul style="list-style-type: none"> <li>○ Impersonal</li> <li>○ Indirect</li> <li>○ Direct</li> </ul> </li> <li>● Imperative</li> </ul> <p><b>5.4. Description of a Technical / Scientific Process</b></p>	02



	<ul style="list-style-type: none"> <li>● Definition</li> <li>● Diagram</li> <li>● Tools/ Apparatus/Software/ Hardware Used</li> <li>● Working</li> <li>● Result</li> </ul>	
6	<p><b>PERSONALITY DEVELOPMENT AND SOCIAL ETIQUETTES</b></p> <p><b>6.1. Personality Development</b></p> <ul style="list-style-type: none"> <li>● Introducing Self and/or a Classmate</li> <li>● Formal Dress Code</li> </ul> <p><b>6.2. Social Etiquettes</b></p> <ul style="list-style-type: none"> <li>● Formal Dining Etiquettes</li> <li>● Cubicle Etiquettes</li> <li>● Responsibility in Using Social Media</li> <li>● Showing Empathy and Respect</li> <li>● Learning Accountability and Accepting Criticism</li> <li>● Demonstrating Flexibility and Cooperation</li> <li>● Selecting Effective Communication Channels</li> </ul>	02

**Assessment:**

**Internal Assessment Test:**

Assessment consists of two class tests of 10 marks each.

**TEST I** -Public speech on general topics (Maximum 5 mins. per student)

**TEST II** - Written test covering modules 1 - 6

The second test should be based on theory and application exercises as mentioned in the syllabus. (Note: Summarization should be a compulsory question in Test II and not in the End Semester Theory Examination.)

**End Semester Theory Examination:**

1. Question paper will comprise of total 06 questions, each carrying 15marks.
2. Total 04 questions need to be solved.
3. Question No: 01 will be compulsory and based on entire syllabus wherein sub-questions of 2 to 5 marks will be asked.
4. Remaining questions will be mixed in nature.( e.g. Suppose Q.2 has part (a) from module3 then part (b) will be from any module other than module 3)
5. In question paper weightage of each module will be proportional to number of respective lecture hours as mentioned in the syllabus
6. The first module (Fundamentals of Communication) will carry 40 % weightage.

**Text Books.**

1. Sanjay Kumar & Pushp Lata (2018). Communication Skills with CD. New Delhi: Oxford University Press.
2. Hemphill, P.D., McCormick, D. W., & Hemphill, R. D. (2001). Business Communication with writing improvement exercises. Upper Saddle River, NJ: Prentice Hall.
3. Locker, Kitty O. Kaczmarek, Stephen Kyo. (2019). Business Communication: Building Critical Skills. Place of publication not identified: Mcgraw-hill.
4. Murphy, H. (1999). Effective Business Communication. Place of publication not identified: Mcgraw-Hill.
5. Raman, M., & Sharma, S. (2016). Technical Communication: Principles and practice. New Delhi: Oxford University Press.
6. Kaul, A. (2015). Effective Business Communication. Place of publication not identified: Prentice-Hall of India.

**Total: 25 Marks**

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned				
		Theory	Pract.	Tut.	Theory	Tut.	Pract.	Total	
FEL205	Professional Communication and Ethics- I	--	2	--	--	--	1	1	
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract./oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (In Hrs)			
		Test1	Test 2	Avg.					
FEL205	Professional Communication and Ethics- I	--	--	--	--	--	25	--	25

### Objectives

To provide practice in ...

1. Active listening with focus on content, purpose, main idea, tone and pronunciation.
2. Fluent speaking and presentation skills in social, academic and professional situations.
3. Faster reading skills for effective comprehension in a variety of texts.
4. Drafting effective written discourse in academics, business and technology.
5. Grooming and projecting impressive persona in all interactions.

**Outcomes:** Learner will be able to...

1. Listen and comprehend all types of spoken discourse successfully.
2. Speak fluently and make effective professional presentations.
3. Read large quantities of text in a short time to comprehend, summarise and evaluate content.
4. Draft precise business letters, academic essays and technical guidelines.
5. Dress finely and conduct themselves with panache in social, academic and professional situations.

List of Assignments & Activities	Details of Assignments	Details of Activities	Hrs.
1.	Written record of listening activities	Listening practice tasks of 3 types (through audio recordings of (1) Monologues (2) Dialogues (3) Formal/Expert Talk or Lecture)	02
2.	Transcription of the public speech along with a plagiarism report	Practice public speech	02
3.	Transcription of the public speech along with a plagiarism report	Public speech (Internal Assessment - I)	02
4.	Written assignment on barriers and non-verbal communication	Role plays / case studies	02
5.	Summarization through graphic organisers (1. Text to graphic		02

	organizer 2. Graphic organizer to text)	NA	
6.	Written record of reading activities	Advanced level reading comprehension with MCQs (similar in level and format to CAT, GRE and GMAT verbal sections)	02
7.	Aptitude test on vocabulary and grammar	Aptitude test on vocabulary and grammar (similar in level and format to CAT, GRE and GMAT verbal sections)	02
8.	2 types of letters in complete block format	NA	02
9.	Written assignment on technical writing (Exercises based on framing Definitions, Describing Technical Objects, Framing User Instructions and Describing Technical Processes)	NA	02
10.	Documentation on case studies / role plays on Module 6	Case studies / role plays	02

**Assessment:**

The distribution of marks for term work shall be as follows:

- Assignments : 20 marks
- Attendance (Theory and Practical) : 05 marks

**University of Mumbai**

**Program Structure B.E. Information Technology, (Rev. 2016)**

**T. E. Information Technology (Semester-V)**

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract	Tut	Theory	TW/Pract	Tut	Total
ITC501	Microcontroller and Embedded Programming	4	-	-	4	-	-	4
ITC502	Internet Programming	4	-	-	4	-	-	4
ITC503	Advanced Data Management Technology	4	-	-	4	-	-	4
ITC504	Cryptography & Network Security	4	-	-	4	-	-	4
ITDLO-I	Department Level Optional Course-I	4	-	-	4	-	-	4
ITL501	Internet Programming Lab	-	2	-	-	1	-	1
ITL502	Security Lab	-	2	-	-	1	-	1
ITL503	OLAP Lab	-	2	-	-	1	-	1
ITL504	IOT (Mini Project) Lab	-	2	-	-	1	-	1
ITL505	Business Communication and Ethics	-	2+2*	-	-	2	-	2
	<b>Total</b>	<b>20</b>	<b>14</b>	<b>-</b>	<b>20</b>	<b>7</b>	<b>-</b>	<b>26</b>

Course Code	Course Name	Examination Scheme								
		Theory					TW	Oral	Oral & Pract	Total
		Internal Assessment			End Sem. Exam	Exam Duration (in Hrs)				
		Test 1	Test 2	Avg.						
ITC501	Microcontroller and Embedded Programming	20	20	20	80	3	-	-	100	
ITC502	Internet Programming	20	20	20	80	3	-	-	100	
ITC503	Advanced Data Management Technology	20	20	20	80	3	-	-	100	
ITC504	Cryptography & Network Security	20	20	20	80	3	-	-	100	
ITDLO-I	Department Level Optional Course-I	20	20	20	80	3	-	-	100	
ITL501	Internet Programming Lab	-	-	-	-	-	25	-	25	50
ITL502	Security Lab	-	-	-	-	-	25	25	-	50
ITL503	OLAP Lab	-	-	-	-	-	25	25	-	50

Course Code	Course Name	Theory	Practical	Tutorial	Theory	TW/ Practical	Tutorial	Total
ITL505	Business Communication and Ethics	2	2*	--	--	2	--	2

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Oral & Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test 1	Test 2	Avg. of two Tests					
ITL505	Business Communication and Ethics	--	--	--	--	50	--	--	50

\* Batch wise practical's

#### Pre-requisite

- Communication Skills

**Course Objective:** Students will try:

1. To inculcate professional and ethical attitude at the workplace
2. To enhance effective communication and interpersonal skills
3. To build multidisciplinary approach towards all life tasks
4. To hone analytical and logical skills for problem-solving

**Course Outcomes:** Students will learn to:

1. Design a technical document using precise language, suitable vocabulary and apt style.
2. Develop the life skills/ interpersonal skills to progress professionally by building stronger relationships.
3. Demonstrate awareness of contemporary issues knowledge of professional and ethical responsibilities.
4. Apply the traits of a suitable candidate for a job/higher education, upon being trained in the techniques of holding a group discussion, facing interviews and writing resume/SOP.
5. Deliver formal presentations effectively implementing the verbal and non-verbal skills.

<b>Module</b>	<b>Detailed Contents</b>	<b>Hrs</b>
<b>01</b>	<b>Report Writing</b>	<b>05</b>
1.1	Objectives of Report Writing	
1.2	Language and Style in a report	
1.3	Types : Informative and Interpretative (Analytical, Survey and Feasibility) and Formats of reports (Memo, Letter, Short and Long Report )	
<b>02</b>	<b>Technical Writing</b>	<b>03</b>
2.1	Technical Paper Writing (IEEE Format)	
2.2	Proposal Writing	
<b>03</b>	<b>Introduction to Interpersonal Skills</b>	<b>08</b>
3.1	Emotional Intelligence	
3.2	Leadership and Motivation	
3.3	Team Building	
3.4	Assertiveness	
3.5	Conflict Resolution and Negotiation Skills	
3.6	Time Management	
3.7	Decision Making	
<b>04</b>	<b>Meetings and Documentation</b>	<b>02</b>
4.1	Strategies for conducting effective meetings	
4.2	Notice, Agenda and Minutes of a meeting	
4.3	Business meeting etiquettes	
<b>05</b>	<b>Introduction to Corporate Ethics</b>	<b>02</b>
5.1	Professional and work ethics (responsible use of social media - Facebook, WA, Twitter etc.)	
5.2	Introduction to Intellectual Property Rights	
5.4	Ethical codes of conduct in business and corporate activities (Personal ethics, conflicting values, choosing a moral response and making ethical decisions)	
<b>06</b>	<b>Employment Skills</b>	<b>06</b>

6.1	Group Discussion	
6.2	Resume Writing	
6.3	Interview Skills	
6.4	Presentation Skills	
6.5	Statement of Purpose	
		26

1. Report Writing (Theory)
2. Technical Proposal
3. Technical Paper Writing (Paraphrasing a published IEEE Technical Paper )
4. Interpersonal Skills (Group activities and Role plays)
5. Interpersonal Skills (Documentation in the form of soft copy or hard copy)
6. Meetings and Documentation (Notice, Agenda, Minutes of Mock Meetings)
7. Corporate ethics (Case studies, Role plays)
8. Writing Resume and Statement of Purpose

#### 1. Term Work:

2. Term work shall consist of all assignments from the list. The distribution of marks for term
3. work shall be as follows:
4. Book Report..... (10) Marks
5. Assignments ..... (10) Marks
6. Project Report Presentation..... (15) Marks
7. Group Discussion..... (10) Marks
8. Attendance ..... (05) Marks
9. **TOTAL: .....(50) Marks**

The final certification and acceptance of term work ensures the satisfactory performance of work assigned and minimum passing in the term work.

#### References

1. Fred Luthans, "*Organizational Behavior*", McGraw Hill, edition
2. Lesiker and Petit, "*Report Writing for Business*", McGraw Hill, edition
3. Huckin and Olsen, "*Technical Writing and Professional Communication*", McGraw Hill

Subject Code	Department Level Optional Course (DLO)	Subject Code	Institute Level Optional Course (ILO)
<b>Semester VIII</b>			
ITDLO8041	User Interaction Design	IL08021	Project Management
ITDLO8042	Information Retrieval Systems	IL08022	Finance Management
ITDLO8043	Knowledge Management	IL08023	Entrepreneurship Development and Management
ITDLO8044	Robotics	IL08024	Human Resource Management
ITDLO8045	Enterprise Resource Planning	IL08025	Professional Ethics and CSR
		IL08026	Research Methodology
		IL08027	IPR and Patenting
		IL08028	Digital Business Management
		IL08029	Environmental Management



Course Code	Course Name	Credits
ILO8021	Project Management	03

**Objectives:**

1. To familiarize the students with the use of a structured methodology/approach for each and every unique project undertaken, including utilizing project management concepts, tools and techniques.
2. To appraise the students with the project management life cycle and make them knowledgeable about the various phases from project initiation through closure.

**Outcomes:** Learner will be able to...

1. Apply selection criteria and select an appropriate project from different options.
2. Write work break down structure for a project and develop a schedule based on it.
3. Identify opportunities and threats to the project and decide an approach to deal with them strategically.
4. Use Earned value technique and determine & predict status of the project.
5. Capture lessons learned during project phases and document them for future reference

Module	Detailed Contents	Hrs
01	<b>Project Management Foundation:</b> Definition of a project, Project Vs Operations, Necessity of project management, Triple constraints, Project life cycles (typical & atypical) Project phases and stage gate process. Role of project manager. Negotiations and resolving conflicts. Project management in various organization structures. PM knowledge areas as per Project Management Institute (PMI).	5
02	<b>Initiating Projects:</b> How to get a project started, Selecting project strategically, Project selection models (Numeric /Scoring Models and Non-numeric models), Project portfolio process, Project sponsor and creating charter; Project proposal. Effective project team, Stages of team development & growth (forming, storming, norming & performing), team dynamics.	6
03	<b>Project Planning and Scheduling:</b> Work Breakdown structure (WBS) and linear responsibility chart, Interface Co-ordination and concurrent engineering, Project cost estimation and budgeting, Top down and bottoms up budgeting, Networking and Scheduling techniques. PERT, CPM, GANTT chart. Introduction to Project Management Information System (PMIS).	8
04	<b>Planning Projects:</b> Crashing project time, Resource loading and leveling, Goldratt's critical chain, Project Stakeholders and Communication plan. Risk Management in projects: Risk management planning, Risk identification and risk register. Qualitative and quantitative risk assessment, Probability and impact matrix. Risk response strategies for positive and negative risks	6
05	<b>5.1 Executing Projects:</b> Planning monitoring and controlling cycle. Information needs and reporting.	8

	<p>engaging with all stakeholders of the projects. Team management, communication and project meetings.</p> <p><b>5.2 Monitoring and Controlling Projects:</b> Earned Value Management techniques for measuring value of work completed; Using milestones for measurement; change requests and scope creep. Project audit.</p> <p><b>5.3 Project Contracting</b> Project procurement management, contracting and outsourcing.</p>	
06	<p><b>6.1 Project Leadership and Ethics:</b> Introduction to project leadership, ethics in projects. Multicultural and virtual projects.</p> <p><b>6.2 Closing the Project:</b> Customer acceptance; Reasons of project termination, Various types of project terminations (Extinction, Addition, Integration, Starvation), Process of project termination, completing a final report; doing a lessons learned analysis; acknowledging successes and failures; Project management templates and other resources; Managing without authority; Areas of further study.</p>	6

## REFERENCES:

1. Jack Meredith & Samuel Mantel, Project Management: A managerial approach, Wiley India, 7<sup>th</sup>Ed
2. A Guide to the Project Management Body of Knowledge (PMBOK<sup>®</sup> Guide), 5<sup>th</sup> Ed, Project Management Institute PA, USA
3. Gido Clements, Project Management, Cengage Learning.
4. Gopalan, Project Management, , Wiley India
5. Dennis Lock, Project Management, Gower Publishing England, 9<sup>th</sup> Ed.

## Assessment:

### **Internal:**

Assessment consists of two tests out of which; one should be compulsory class test and the other is either a class test or assignment on live problems or course project.

### **End Semester Theory Examination:**

Some guidelines for setting up the question paper. Minimum 80% syllabus should be covered in question papers of end semester examination. **In question paper weightage of each module will be proportional to number of respective lecture hours as mention in the syllabus.**

1. Question paper will comprise of total six question
2. All question carry equal marks
3. Questions will be mixed in nature (for example supposed Q.2 has part (a) from module 3 then part (b) will be from any module other than module 3)
4. Only Four question need to be solved.

presentation. Presentation of the report should be made in the language they are comfortable with, without any insistence that it should be in English. It is more important that they feel comfortable and confident. Each group may make the presentation through 4-5 of its group members or more. In case, the number of new students in a college is large, the presentation should be made by each group in front of 4 other groups besides their own, thus there would be about 100 students (in 5 groups) in the audience in a session. Several such sessions could run in parallel or serially. In each session, their faculty mentors and student guides, if any, should also be in the audience. These sessions would tell you how well the program ran, and what the students are feeling at the end of the program. This would also serve as a grand closure to the program.

A certificate shall be awarded to all the students, upon successful completion of the induction program based on their report and presentation.

**Tentative schedule of 1<sup>st</sup> Week Induction Program:**

<b>Day 1</b>	Session 1	Orientation program
	Session 2	Mentoring (group formation and introduction)
<b>Day 2</b>	Session 3	Diagnostic test (basic English, maths and computer operation)
	Session 4	Familiarisation of Department and Institute (Visits to department, laboratory, Library, Examination cell, office etc)
<b>Day 3</b>	Session 5	Physical Activity ( Yoga, sports etc)
	Session 6	Universal human values session
<b>Day 4</b>	Session 7	Proficiency Modules (Short courses on basic maths, English and computer operation etc. for identified students)
	Session 8	Physical Activity ( Yoga, sports etc)
<b>Day 5</b>	Session 9	Proficiency Modules (Short courses on basic maths, English and computer operation etc. for identified students)
	Session 10	Creative Arts, Cultural and Literary Activity

A session may be conducted for around 2-3 hours each.

Minimum 12 sessions to be conducted from the following 20 sessions, from 2<sup>nd</sup> week to last week of academics, throughout the semester.

Session 11	Physical Activity ( Yoga, sports etc)- 1
Session 12	Extra-Curricular Activity- 1
Session 13	Physical Activity ( Yoga, sports etc)-2
Session 14	Extra-Curricular Activity- 2
Session 15	Physical Activity ( Yoga, sports etc)- 3
Session 16	Lectures /Workshops by Eminent People- 1
Session 17	Physical Activity ( Yoga, sports etc)- 4
Session 18	Lectures /Workshops by Eminent People- 2
Session 19	Creative Arts, Cultural and Literary Activity- 1
Session 20	Lectures /Workshops by Eminent People- 3
Session 21	Creative Arts, Cultural and Literary Activity- 2
Session 22	Universal Human Values- 1(Group Discussion among students as per mentoring group on various aspects of life, values, ethics etc.)
Session 23	Creative Arts, Cultural and Literary Activity- 3
Session 24	Universal Human Values- 2 (Group Discussion among students as per mentoring group on various aspects of life, values, ethics etc.)
Session 25	Creative Arts, Cultural and Literary Activity- 4
Session 26	Universal Human Values- 3 (Group Discussion among students as per mentoring group on various aspects of life, values, ethics etc.)
Session 27	Creative Arts, Cultural and Literary Activity- 5
Session 28	Physical Activity ( Yoga, sports etc)- 5
Session 29	Feedback and Report on the Program- 1
Session 30	Feedback and Report on the Program- 2

**B.E. (Production) Sem. VIII**

Course Code	Course Name	Teaching Scheme (Contact Hours)		Credits Assigned					
		Theory	Pract	Theory	Pract	Total			
PEC801	Fluid Power & Automation	04	--	04	--	04			
PEC802	Industrial Engineering and Human Resource Management	04	--	04	--	04			
PEC803	Economics, Finance, Accounting & Costing	04	--	04	--	04			
PEDLO 803X	Department Level Optional Course III	04	--	04	--	04			
ILO802X	Institute Level Optional courses	03	--	03	--	03			
PEL801	Fluid Power & Automation Laboratory	--	02	--	01	01			
PEL802	Industrial Engineering and Human Resource Management Laboratory	--	02	--	01	01			
PEL803	Economics, Finance, Accounting & Costing Tutorial	--	02	--	01	01			
<b>Total</b>		<b>19</b>	<b>06</b>	<b>19</b>	<b>03</b>	<b>22</b>			
<b>Examination Scheme</b>									
Course Code	Course Name	Theory					Term Work	Pract. /Oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (In Hrs)			
		Test1	Test 2	Avg.					
PEC801	Fluid Power & Automation	20	20	20	80	03	--	--	100
PEC802	Industrial Engineering and Human Resource Management	20	20	20	80	03	--	--	100
PEC803	Economics, Finance, Accounting & Costing	20	20	20	80	03	--	--	100
PEDLO 803X	Department Level Optional Course III	20	20	20	80	03	--	--	100
ILO802X	Institute Level Optional courses	20	20	20	80	03	--	--	100
PEL801	Fluid Power & Automation Laboratory	--	--	--	--	--	25	25	50
PEL802	Industrial Engineering and Human Resource Management Laboratory	--	--	--	--	--	25	25	50
PEL803	Economics, Finance, Accounting & Costing Tutorial	--	--	--	--	--	25	--	25
<b>Total</b>				<b>100</b>	<b>400</b>		<b>75</b>	<b>50</b>	<b>625</b>

Course Code	Course Name	Credits
<b>PEC802</b>	<b>Industrial Engineering and Human Resource Management</b>	<b>04</b>

### Objectives

1. To familiarize with the practices of industrial engineering and human resource management.
2. To familiarize with the concepts of strategic objectives, optimization of human resource potential and enhancing of human effectiveness.

### Outcomes learner will be able to...

1. Apply different industrial engineering principles for productivity enhancement.
2. Design integrated systems in industrial engineering.
3. Develop a concept in identifying, planning, and deployment of man power.
4. Develop an inter personal and soft skills.
5. Identify the training needs of employs at different levels.
6. Analyze legal aspects of employment

Module	Contents	Hrs
01	<p><b>1.1 Introduction to Industrial Engineering (IE) :</b> Definition, History and Development of IE, Present Scenario of IE, Contributions to IE, Activities and approaches of IE, Objectives and Functions of IE.</p> <p><b>Productivity:</b> Definition, Productivity in Enterprise, Task of Management, Productivity of Materials, Land, Building, Machine and Power, Measurement of Productivity, Factors affecting productivity, Productivity Improvement likes 5s, Poka-Yoke, Kaizen, Kanban, Quality Improvement Techniques like QFD, FMEA, Ishikawa diagram, SMED</p> <p><b>1.2 Method Study:</b> Objectives and procedure for methods analysis, Recording techniques, Micro motion and macro-motion study: Principles of motion economy, Normal work areas and work place design.</p> <p><b>1.3 Work Measurement:</b> Objectives, Work measurement techniques - time study, work sampling, pre-determined motion time standards (PMTS) Determination of time standards, Observed time, basic time, normal time, rating factors, allowances, and standard time, Maynard's Operation Sequence Technique (MOST).</p> <p><b>1.4 Job Evaluation and Wage Plan:</b> Objective, Methods of job evaluation, job evaluation procedure, merit rating (performance appraisal), method of merit rating, wage and wage incentive plans.</p>	14
02	<p><b>2.1 Value Analysis :</b> An Overview Of Value Analysis -Concepts and approaches of value analysis and engineering - importance of value, Function - identity, clarify – analysis Evaluation of VE-Evaluation of function, Problem setting system, problem solving system, value analysis case studies, Effective organization for value work, function analysis system techniques- FAST diagram, Case studies.</p> <p><b>2.2 Ergonomics :</b></p>	10

	<p>Introduction: Inter disciplinary nature of ergonomics modern ergonomics human performance – information processing – factors affecting human performance – physical workload and energy expenditure.</p> <p>Workspace Design - Anthropometry – workspace design for standing and seated workers – Arrangements of components within a physical space – Interpersonal aspect of workplace design.</p> <p>Recent Advances and Trends - Legislative trends – Trends in work system design – occupational diseases – Application of Ergonomics’ in automobiles.</p>	
03	<p><b>3.1 Human Resource Management :</b>  Introduction to HRM and Management Thought, Historical Developments of HRD, HRD core functions and activities, Virtual HR –E-Recruiting, HRIS- Human Resource Information System, E-Training, Human Resource Planning, Job Analysis, Recruitment and selection, Steps and types of Training and Development, Promotion, Safety and OSHA standards for HR, Differences of HR with Personnel Management, Careers with HR.</p>	06
04	<p><b>4.1 Human Behaviour :</b>  Definition, Factors affecting human behaviour – Genetics, social norms, creativity, attitude, faith and culture, Group and Group behaviour.</p> <p><b>4.2 Motivation :</b>  Definition, Types of theories and models of motivation, Practical Applications of motivation – Employee morale, Employee recognition programs, Drug abuse, Education, Business and work engagement.</p>	06
05	<p><b>5.1 Decision Making :</b>  Introduction, Problem Analysis through Decision making tools, Characteristics of decision making, Steps in Rational decision making.</p> <p><b>5.2 Communication:</b>  Definition, Types, Historical Developments in communication, Barriers to communication, Introduction to Bio-communications, Noise and its types,</p> <p><b>5.3 Leadership:</b>  Definition, Leadership Theories, Leadership styles, Self – Leadership.</p>	06
06	<p><b>Industrial Relations :</b>  Introduction, Historic perspective, Industrial Relations today, Collective Bargaining, Trade Unions and Managing Conflicts, Labour Laws and Legislations, Importance of Industrial Relations, Objectives of Industrial Relations, Introduction to Factories Act, Industries Disputes Act, Salary and Wage Fixation and Workman Compensation Act, Employee Grievances, Redressal.</p>	08

### Assessment:

#### **Internal Assessment for 20 marks:**

##### **Consisting Two Compulsory Class Tests**

First test based on approximately 40% of contents and second test based on remaining contents (approximately 40% but excluding contents covered in Test I)

**End Semester Examination:**

Weightage of each module in end semester examination will be proportional to number of respective lecture hours mentioned in the curriculum.

1. Question paper will comprise of total **six questions, each carrying 20 marks**
2. **Question 1** will be **compulsory** and should **cover maximum contents of the curriculum**
3. **Remaining questions will be mixed in nature** (for example if Q.2 has part (a) from module 3 then part (b) will be from any module other than module 3)
4. Only **Four questions need to be solved**

**Reference Books:**

1. *Industrial Engineering and Production Management* -By M. Mahajan, Dhanpat Rai and Co.
2. *Human Resource Management*, Aswathapa. K, TMH.
3. Miles, L.D., "*Techniques of Value Engineering and Analysis*", McGraw Hill Book Company.
4. "*Industrial Engineering and Management*", Khanna, O.P., Dhanpat Rai and Sons.
5. *Personnel Management and Human Resources*, C.S. Venkataraman, B.K. Srivastava.
6. *Principles of Management*, P.C. Tripathi, P.N. Reddy.
7. *Organizational Behaviour*, Text and cases, Uma Sekaran.
8. *Factory Administration and Management*, A.S. Deshpande.
9. Bridger, R.S. "*Introduction to Ergonomics*", McGraw Hill.
10. Micomuc, J. "*Human factors in Engineering and Design*", McGraw Hill.
11. *Work Study*, ILO, Geneva.



**B.E. (Electronics Engineering) – Semester VIII**

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total
ELN801	Internet of Things	04	--	--	04	--	--	04
ELN 802	Analog and Mixed VLSI Design	04	--	--	04	--	--	04
ELXDLO804X	Department Level Optional course IV	04	--	--	04	--	--	04
ILO802X	Institute Level Optional course II <sup>2</sup>	03	--	--	03	--	--	03
ELXL801	Internet of Things Lab.		02			01	--	01
ELXL802	Analog and Mixed VLSI Design Lab.		02			01	--	01
ELXL803	Project-II	--	12	--	--	06	--	06
ELXLDLO804X	Department Level Optional Courses IV Lab.		02			01	--	01
	<b>TOTAL</b>	<b>15</b>	<b>18</b>	<b>--</b>	<b>15</b>	<b>9</b>	<b>--</b>	<b>24</b>

Course Code	Course Name	Examination Scheme – Semester VIII							Total
		Theory					Term Work	Oral /Prac	
		Internal Assessment (IA)			End Sem Exam Marks	Exam Duration (Hours)			
Test I	Test II	AVG.							
ELN801	Internet of Things	20	20	20	80	03	--	--	100
ELN 802	Analog and Mixed VLSI Design	20	20	20	80	03	--	--	100
ELXDLO804X	Department Level Optional course IV	20	20	20	80	03	--	--	100
ILO802X	Institute Level Optional course II	20	20	20	80	03	--	--	100
ELXL801	Internet of Things Lab.						25	25	50
ELXL802	Analog and Mixed VLSI Design Lab.						25	25	50
ELXL803	Project-II	--	--	--	--	--	100	50	150
ELXLDLO804X	Department Level Optional Courses IV Lab.						25	25	50
	<b>Total</b>	<b>80</b>	<b>80</b>	<b>80</b>	<b>320</b>	<b>15</b>	<b>150</b>	<b>150</b>	<b>700</b>

Course Code	Department Level Optional Course III	Course Code	Institute Level Optional Course I <sup>1</sup>
ELXDLO7031	Neural Network and Fuzzy Logic	ILO7011	Product Lifecycle Management
ELXDLO7032	Advance Networking Technologies	ILO7012	Reliability Engineering
ELXDLO7033	Robotics	ILO7013	Management Information System
ELXDLO7034	Integrated Circuit Technology	ILO7014	Design of Experiments
		ILO7015	Operation Research
		ILO7016	Cyber Security and Laws
		ILO7017	Disaster Management and Mitigation Measures
		ILO7018	Energy Audit and Management

Course Code	Department Level Elective Course IV	Course Code	Institute Level Elective Course II <sup>1</sup>
ELXDLO8041	Advanced Power Electronics	ILO8021	Project Management
ELXDLO8042	MEMS Technology	ILO8022	Finance Management
ELXDLO8043	Virtual Instrumentation	ILO8023	Entrepreneurship Development and Management
ELXDLO8044	Digital Image Processing	ILO8024	Human Resource Management
		ILO8025	Professional Ethics and CSR
		ILO8026	Research Methodology
		ILO8027	IPR and Patenting
		ILO8028	Digital Business Management
		ILO8029	Environmental Management

Course Code	Course Name	Credits
ILO7016	Cyber Security and Laws	03

**Objectives:**

1. To understand and identify different types cybercrime and cyber law
2. To recognized Indian IT Act 2008 and its latest amendments
3. To learn various types of security standards compliances

**Outcomes:** Learner will be able to ...

1. Understand the concept of cybercrime and its effect on outside world
2. Interpret and apply IT law in various legal issues
3. Distinguish different aspects of cyber law
4. Apply Information Security Standards compliance during software design and development

Module	Detailed Contents	Hrs
01	<b>Introduction to Cybercrime:</b> Cybercrime definition and origins of the world, Cybercrime and information security, Classifications of cybercrime, Cybercrime and the Indian ITA 2008. A global Perspective on cybercrimes.	4
02	<b>Cyber offenses &amp; Cybercrime:</b> How criminal plan the attacks, Social Engg, Cyber stalking, Cyber café and Cybercrimes, Botnets, Attack vector, Cloud computing, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit Card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication Service Security, Attacks on Mobile/Cell Phones, Mobile Devices Security Implications for Organizations, Organizational Measures for Handling Mobile Devices-Related Security Issues, Organizational Security Policies and Measures in Mobile Computing Era, Laptops	9
03	<b>Tools and Methods Used in Cyberline</b> Phishing, Password Cracking, Keyloggers and Spywares, Virus and Worms, Steganography, DoS and DDoS Attacks, SQL Injection, Buffer Over Flow, Attacks on Wireless Networks, Phishing, Identity Theft (ID Theft)	6
04	<b>The Concept of Cyberspace</b> E-Commerce, The Contract Aspects in Cyber Law, The Security Aspect of Cyber Law	8

	,The Intellectual Property Aspect in Cyber Law , The Evidence Aspect in Cyber Law , The Criminal Aspect in Cyber Law, Global Trends in Cyber Law , Legal Framework for Electronic Data Interchange Law Relating to Electronic Banking , The Need for an Indian Cyber Law	
05	<b>Indian IT Act.</b> Cyber Crime and Criminal Justice : Penalties, Adjudication and Appeals Under the IT Act, 2000, IT Act. 2008 and its Amendments	6
06	<b>Information Security Standard compliances</b> SOX, GLBA, HIPAA, ISO, FISMA, NERC, PCI.	6

**Assessment:****Internal:**

Assessment consists of two tests out of which: one should be compulsory class test and the other is either a class test or assignment on live problems or course project.

**End Semester Theory Examination:**

Some guidelines for setting up the question paper. Minimum 80% syllabus should be covered in question papers of end semester examination.

**In question paper weightage of each module will be proportional to number of respective lecture hours as mention in the syllabus.**

1. Question paper will comprise of total six question
2. All question carry equal marks
3. Questions will be mixed in nature (for example supposed Q.2 has part (a) from module 3 then part (b) will be from any module other than module 3)
4. Only Four question need to be solved.

**REFERENCES:**

1. Nina Godbole, Sunit Belapure, *Cyber Security*, Wiley India, New Delhi
2. The Indian Cyber Law by Suresh T. Vishwanathan; Bharat Law House New Delhi
3. The Information technology Act, 2000; Bare Act- Professional Book Publishers, New Delhi.
4. Cyber Law & Cyber Crimes By Advocate Prashant Mali; Snow White Publications, Mumbai
5. Nina Godbole, *Information Systems Security*, Wiley India, New Delhi
6. Kenneth J. Knapp, *Cyber Security & Global Information Assurance* Information Science Publishing.
7. William Stallings, *Cryptography and Network Security*, Pearson Publication

8. Websites for more information is available on : The Information Technology ACT, 2008- TIFR : <https://www.tifrr.res.in>
9. Website for more information , A Compliance Primer for IT professional : <https://www.sans.org/reading-room/whitepapers/compliance/compliance-primer-professionals-33538>

Course Code	Course Name	Teaching scheme			Credit assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
ELX 601	Embedded Systems & Real Time Operating System	04	--	--	04	--	--	04

Course Code	Course Name	Examination Scheme									
		Theory					Term work	Pract.	Oral	Pract. / Oral	Total
		Internal Assessment			End sem	Duration (hrs)					
		Test 1	Test 2	Avg							
ELX 601	Embedded Systems & Real Time Operating System	20	20	20	80	03	--	--	--	--	100

### Course Objectives

To study concepts involved in embedded hardware and software for systems realisation.

### Course Outcomes

At the end of the course, the learner will have the ability to

1. Identify and describe various characteristic features and applications of embedded systems.
2. Analyse and identify hardware for embedded systems implementation.
3. Analyse and identify various software issues involved in Embedded systems for real time requirements.
4. Analyse and explain the design life-cycle for embedded system implementation.

Module	Contents	Time
1.	<b>Introduction to Embedded Systems</b>	<b>04</b>
	1.1 Characteristics and Design metrics of Embedded system.	
	1.2 Real time systems: Need for Real-time systems, Hard-Soft Real-time systems.	
	1.3 Challenges in Embedded system Design: Power, Speed and Code density.	
	<b>Embedded Hardware</b>	<b>12</b>
2.	2.1 Embedded cores, Types of memories, Sensors (Optical encoders, Resistive) and Actuators (Solenoid valves, Relay/switch, Opto-couplers)	
	2.2 Power supply considerations in Embedded systems: Low power features- Idle & Power down mode, Sleep mode, Brown-out detection.	
	2.3 Communication Interfaces: Comparative study of serial communication interfaces (RS-232, RS-485), I2C, CAN, USB (v2.0), Bluetooth, Zig-Bee. Selection criteria of above interfaces. <b>(Frame formats of above protocols are not expected)</b>	
	<b>Embedded Software</b>	<b>14</b>
3.	3.1 Program Modelling concepts: DFG, FSM, UML	
	3.2 Embedded C-programming concepts (from Embedded system point of view): Data types, Modifiers, Qualifiers, Functions, Macros, Interrupt service routine, Device drivers.	
	3.3 Real-time Operating system: Need of RTOS in Embedded system software and comparison with GPOS, Foreground/Background processes, Interrupt latency, Task, Task states, Multi-tasking, Context switching, Task scheduling, Scheduling algorithms-Rate Monotonic Scheduling, Earliest Deadline First (with numericals), Inter-process communication: Semaphore, Mailbox, Message queues, Event timers, Task synchronisation- Shared data, Priority inversion, Deadlock. Memory Management	
	3.4 Introduction to $\mu$ COS II RTOS: Study of Kernel structure of $\mu$ COS II, $\mu$ COS II functions for Initialisation, Task creation, Inter-task communication and Resource management, Memory management	<b>08</b>
	<b>System Integration , Testing and Debugging Methodology</b>	<b>04</b>
4.	4.1 Embedded Product Design Life-Cycle (EDLC)	
	4.2 Hardware-Software Co-design	
	4.3 Testing & Debugging: Boundary-scan/JTAG interface concepts, Black-Box testing, White-Box testing, Hardware emulation, Logic analyser.	
	<b>Case Studies</b>	<b>06</b>
5.	5.1 Soft Real-time: Automatic Chocolate Vending machine using $\mu$ COS II RTOS- Requirements study, Specification study using UML, Hardware architecture, Software architecture	
	5.2 Hard Real-time: Car Cruise-Control using $\mu$ COS II RTOS- Requirements study, specification study using UML, Hardware architecture, Software Architecture	

**Text books:**

1. Dr. K.V. K. K. Prasad, "Embedded Real Time System: Concepts, Design and Programming", Dreamtech, New Delhi, Edition 2014.
2. Jean J. Labrosse, "MicroC / OS-II The Real-Time Kernel", CMP Books, 2011, Edition 2<sup>nd</sup>.
3. Rajkamal, "Embedded Systems: Architecture, Programming and Design", McGraw Hill Education (India) Private Limited, New Delhi, 2015, Edition 3<sup>rd</sup>.
4. SriramIyer, Pankaj Gupta, "Embedded Real Time Systems Programming", Tata McGraw Hill Publishing Company Ltd., 2003.

**Reference Books:**

1. DavidSimon, "An Embedded Software Primer", Pearson, 2009.
2. Jonathan W. Valvano, "Embedded Microcomputer Systems – Real Time Interfacing", Publisher - Cengage Learning, 2012 Edition 3<sup>rd</sup>.
3. AndrewSloss, DominicSymes, Chris Wright, "ARM System Developers Guide Designing and Optimising System Software", Elsevier, 2004
4. FrankVahid, Tony Givargis, "Embedded System Design – A Unified Hardware/Software Introduction", John Wiley & Sons Inc., 2002.
5. Shibu K V, "Introduction to Embedded Systems", Tata McGraw Hill Education Private Limited, New Delhi, 2009.

**Internal Assessment (IA):**

Two tests must be conducted which should cover at least 80% of syllabus. The average marks of both the test will be considered as final IA marks.

**End Semester Examination:**

1. Question paper will comprise of 6 questions, each carrying 20 marks.
2. The students need to solve total of 4 questions.
3. Question No.1 will be compulsory and based on the entire syllabus.
4. Remaining question (Q.2 to Q.6) will be set from all the modules.
5. Weightage of marks, commensurate with the time allocated to the respective module.



Program Structure B.E. Computer Engineering, (Rev. 2016) w.e.f. AY 2018-19

**T. E. Computer Engineering (Semester-VI)**

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract	Tut	Theory	TW/Pract	Tut	Total
CSC601	Software Engineering	4	-	-	4	-	-	4
CSC602	System Programming & Compiler Construction	4	-	-	4	-	-	4
CSC603	Data Warehousing & Mining	4	-	-	4	-	-	4
CSC604	Cryptography & System Security	4	-	-	4	-	-	4
CSDLO 601X	Department Level Optional Course -II	4	-	-	4	-	-	4
CSL601	Software Engineering Lab	-	2	-	-	1	-	1
CSL602	System software Lab	-	2	-	-	1	-	1
CSL603	Data Warehousing & Mining Lab	-	2	-	-	1	-	1
CSL604	System Security Lab	-	2	-	-	1	-	1
CSP605	Mini-Project	-	4	-	-	2	-	2
<b>Total</b>		<b>20</b>	<b>12</b>	<b>-</b>	<b>20</b>	<b>6</b>	<b>-</b>	<b>26</b>

Course Code	Course Name	Examination Scheme								
		Theory					TW	Oral	Oral & Pract	Total
		Internal Assessment			End Sem. Exam	Exam Duration (in Hrs)				
Test 1	Test 2	Avg.								
CSC601	Software Engineering	20	20	20	80	3	-	-	-	100
CSC602	System Programming & Compiler Construction	20	20	20	80	3	-	-	-	100
CSC603	Data Warehousing & Mining	20	20	20	80	3	-	-	-	100
CSC604	Cryptography & System Security	20	20	20	80	3	-	-	-	100
CSDLO 601X	Department Level Optional Course -II	20	20	20	80	3	-	-	-	100
CSL601	Software Engineering Lab	-	-	-	-	-	25	25	--	50
CSL602	System Software Lab	-	-	-	-	-	25	--	25	50
CSL603	Data Warehousing & Mining Lab	-	-	-	-	-	25	--	25	50
CSL604	System Security Lab	-	-	-	-	-	25	--	25	50
CSP605	Mini-Project	-	-	-	-	-	25	--	25	50
<b>Total</b>		<b>100</b>	<b>100</b>	<b>100</b>	<b>400</b>	<b>-</b>	<b>125</b>	<b>25</b>	<b>100</b>	<b>750</b>

Course Code	Course Name	Credits
CSC601	Software Engineering	4

#### Course objectives:

The main objective of the course is to introduce to the students about the product that is to be engineered and the processes that provides a framework for the engineering methodologies and practices.

1. To provide the knowledge of software engineering discipline.
2. To apply analysis, design and testing principles to software project development.
3. To demonstrate and evaluate real time projects with respect to software engineering principles.

#### Course outcomes:

On successful completion of course, learners will be able to:

1. Understand and demonstrate basic knowledge in software engineering.
2. Identify requirements, analyze and prepare models.
3. Plan, schedule and track the progress of the projects.
4. Design & develop the software projects.
5. Identify risks, manage the change to assure quality in software projects.
6. Apply testing principles on software project and understand the maintenance concepts.

#### Prerequisite:

1. Concepts of Object Oriented Programming & Methodology
2. Knowledge of developing applications with front end & back end connectivity.

#### Course syllabus:

Module No.	Unit No.	Topics	Hrs.
1.0		<b>Introduction To Software Engineering and Process Models</b>	08
	1.1	Nature of Software, Software Engineering, Software Process, Capability Maturity Model (CMM)	
	1.2	Generic Process Model, <b>Prescriptive Process Models:</b> The Waterfall Model, V-model, Incremental Process Models, Evolutionary Process Models, Concurrent Models, Agile process, Agility Principles, Extreme Programming (XP), Scrum, Kanban model	
2.0		<b>Requirements Analysis and Modelling</b>	08
	2.1	Requirement Elicitation, Software requirement specification (SRS), Developing Use Cases (UML)	
	2.2	Requirement Model – Scenario-based model, Class-based model, Behavioural model.	
3.0		<b>Project Scheduling and Tracking</b>	08
	3.1	Management Spectrum, 3Ps (people, product and process)	
	3.2	Process and Project metrics	

	<b>3.3</b>	<b>Software Project Estimation:</b> LOC, FP, Empirical Estimation Models - COCOMO II Model, Specialized Estimation Techniques	
	<b>3.4</b>	<b>Project scheduling:</b> Defining a Task Set for the Software Project, Timeline charts, Tracking the Schedule, Earned Value Analysis	
<b>4.0</b>		<b>Software Design</b>	<b>10</b>
	<b>4.1</b>	Design Principles, Design Concepts, Effective Modular Design – Cohesion and Coupling	
	<b>4.2</b>	Architectural Design	
	<b>4.3</b>	Component-level design	
	<b>4.4</b>	User Interface Design	
<b>5.0</b>		<b>Software Risk, Configuration Management &amp; Quality Assurance</b>	<b>08</b>
	<b>5.1</b>	Risk Identification, Risk Assessment, Risk Projection, RMMM	
	<b>5.2</b>	Software Configuration management, SCM repositories, SCM process	
	<b>5.3</b>	Software Quality Assurance Task and Plan, Metrics, Software Reliability, Formal Technical Review (FTR), Walkthrough	
<b>6.0</b>		<b>Software Testing and Maintenance</b>	<b>10</b>
	<b>6.1</b>	Strategic Approach to Software Testing, Unit testing, Integration testing Verification, Validation Testing, System Testing	
	<b>6.2</b>	Software Testing Fundamentals, White-Box Testing , Basis Path Testing, Control Structure Testing, Black-Box Testing,	
	<b>6.3</b>	Software maintenance and its types, Software Re-engineering, Reverse Engineering	
		<b>Total</b>	<b>52</b>

#### **Internal Assessment:**

Assessment consists of two class tests of 20 marks each. The first class test is to be conducted when approx. 40% syllabus is completed and second class test when additional 40% syllabus is completed. Duration of each test shall be one hour.

#### **End Semester Theory Examination:**

1. Question paper will comprise of 06 questions, each carrying 20 marks.
2. The students need to solve total 04 questions.
3. Question No.1 will be compulsory and based on entire syllabus.
4. Remaining questions (Q.2 to Q.6) will be selected from all the modules.

#### **Text Books:**

1. Roger Pressman, "Software Engineering: A Practitioner's Approach", McGraw-Hill Publications
2. Ian Sommerville, "Software Engineering", Pearson Education (9th edition)
3. Ali Behfroz and Fredeick J.Hudson, "Software Engineering Fundamentals", Oxford University Press

#### **Reference Books:**

1. Ugrasen Suman, "Software Engineering – Concepts and Practices", Cengage Learning
2. Pankaj Jalote, "An integrated approach to Software Engineering", Springer/Narosa
3. Jibitesh Mishra and Ashok Mohanty, "Software Engineering", Pearson
4. Rajib Mall, "Fundamentals of Software Engineering", Prentice Hall India

Course Code	Course Name	Credits
CSC604	Cryptography and System Security	4

**Course Objectives:**

1. To introduce classical encryption techniques and concepts of modular arithmetic and number theory.
2. To explore the working principles and utilities of various cryptographic algorithms including secret key cryptography, hashes and message digests, and public key algorithms
3. To explore the design issues and working principles of various authentication protocols, PKI standards and various secure communication standards including Kerberos, IPsec, and SSL/TLS and email.
4. To develop the ability to use existing cryptographic utilities to build programs for secure communication.

**Course Outcomes:** At the end of the course learner will able to

1. Understand system security goals and concepts, classical encryption techniques and acquire fundamental knowledge on the concepts of modular arithmetic and number theory.
2. Understand, compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication
3. Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes.
4. Apply different digital signature algorithms to achieve authentication and design secure applications
5. Understand network security basics, analyze different attacks on networks and evaluate the performance of firewalls and security protocols like SSL, IPsec, and PGP.
6. Analyze and apply system security concept to recognize malicious code.

**Detailed Syllabus:**

Module No	Unit No	Detailed Content	Hrs
1	<b>Introduction &amp; Number Theory</b>		10
	1.1	Security Goals, Services, Mechanisms and attacks, The OSI security architecture, Network security model, Classical Encryption techniques, Symmetric cipher model, mono-alphabetic and poly-alphabetic substitution techniques: Vigenere cipher, playfair cipher, Hill cipher, transposition techniques: keyed and keyless transposition ciphers, steganography.	
	1.2	Modular Arithmetic and Number Theory:- Euclid's algorithm—Prime numbers-Fermat's and Euler's theorem- Testing for primality -The Chinese remainder theorem, Discrete logarithms.	
2	<b>Symmetric and Asymmetric key Cryptography and key Management</b>		12

	2.1	Block cipher principles, block cipher modes of operation, DES, Double DES, Triple DES, Advanced Encryption Standard (AES), Stream Ciphers: RC5 algorithm.	
	2.2	Public key cryptography: Principles of public key cryptosystems-The RSA algorithm, The knapsack algorithm, ElGamal Algorithm.	
	2.3	Key management techniques: using symmetric and asymmetric algorithms and trusted third party. Diffie Hellman Key exchange algorithm.	
	<b>Hashes, Message Digests and Digital Certificates</b>		<b>06</b>
3	3.1	Cryptographic hash functions, Properties of secure hash function, MD5, SHA-1, MAC, HMAC, CMAC.	
	3.2	Digital Certificate: X.509, PKI	
	<b>Authentication Protocols &amp; Digital signature schemes</b>		<b>08</b>
4	4.1	User Authentication and Entity Authentication, One-way and mutual authentication schemes, Needham Schroeder Authentication protocol, Kerberos Authentication protocol.	
	4.2	Digital Signature Schemes – RSA, ElGamal and Schnorr signature schemes.	
	<b>Network Security and Applications</b>		<b>10</b>
	5.1	Network security basics: TCP/IP vulnerabilities (Layer wise), Packet Sniffing, ARP spoofing, port scanning, IP spoofing, TCP syn flood, DNS Spoofing.	
5	5.2	Denial of Service: Classic DOS attacks, Source Address spoofing, ICMP flood, SYN flood, UDP flood, Distributed Denial of Service, Defenses against Denial of Service Attacks.	
	5.3	Internet Security Protocols: SSL, IPSEC, Secure Email: PGP, Firewalls, IDS and types, Honey pots	
	<b>System Security</b>		<b>06</b>
6	6.1	Software Vulnerabilities: Buffer Overflow, Format string, cross-site scripting, SQL injection, Malware: Viruses, Worms, Trojans, Logic Bomb, Bots, Rootkits.	

**Text Books:**

1. William Stallings, Cryptography and Network Security, Principles and Practice, 6<sup>th</sup> Edition, Pearson Education, March 2013
2. Behrouz A. Ferouzan, "Cryptography & Network Security", Tata Mc Graw Hill
3. Bernard Menezes, "Cryptography & Network Security", Cengage Learning.
4. Network Security Bible, Eric Cole, Second Edition, Wiley.

**Reference Books:**

1. Applied Cryptography, Protocols Algorithms and Source Code in C, Bruce Schneier, Wiley.
2. Cryptography and Network Security, Atul Kahate, Tata Mc Graw Hill.

**Assessment:****Internal Assessment:**

Assessment consists of two class tests of 20 marks each. The first class test is to be conducted when approx. 40% syllabus is completed and second class test when additional 40% syllabus is completed. Duration of each test shall be one hour.

**Theory Examination:**

1. Question paper will comprise of total six questions.
2. All question carry equal marks
3. Questions will be mixed in nature (for example supposed Q.2 has part (a) from module 3 then part (b) will be from any module other than module 3)
4. Only Four question need to be solved.

**In question paper weightage of each module will be proportional to number of respective lecture hours as mentioned in the syllabus.**

Sem.	Department Level Optional Course (DLOC)	Institute Level Optional Course (ILOC)
V	CSDLO5011: Multimedia System CSDLO5012: Advance Operating System CSDLO5013: Advance Algorithm	-----
VI	CSDLO6021: Machine Learning CSDLO6022: Advance Database System CSDLO6023: Enterprise Resource Planning CSDLO6024: Advance Computer Network	-----
VII	CSDLO7031: Advance System Security & Digital Forensics CSDLO7032: Big Data & Analytics CSDLO7033: Robotics	ILO7011. Product Lifecycle Management ILO7012. Reliability Engineering ILO7013. Management Information System ILO7014. Design of Experiments ILO7015. Operation Research ILO7016. Cyber Security and Laws ILO7017. Disaster Management & Mitigation Measures ILO7018. Energy Audit and Management ILO7019. Development Engineering
VIII	DLO8011: High Performance Computing DLO8012: Natural Language Processing DLO8013: Adhoc Wireless Network	ILO8021. Project Management ILO8022. Finance Management ILO8023. Entrepreneurship Development and Management ILO8024. Human Resource Management ILO8025. Professional Ethics and CSR ILO8026. Research Methodology ILO8027. IPR and Patenting ILO8028. Digital Business Management ILO8029. Environmental Management

Course Code	Course Name	Credits
CSDLO7031	Advanced System Security and Digital Forensics	4

**Course Objectives:**

1. To understand cyber attacks and defence strategies.
2. To understand underlying principles of access control mechanisms.
3. To explore software vulnerabilities, attacks and protection mechanisms of wireless networks and protocols, mobile devices and web applications.
4. To develop and mitigate security management and policies.
5. To understand and explore techniques used in digital forensics.

**Course Outcomes:** At the end of the course learner will able to

1. Understand cyber attacks and apply access control policies and control mechanisms.
2. Identify malicious code and targeted malicious code.
3. Detect and counter threats to web applications.
4. Understand the vulnerabilities of Wi-Fi networks and explore different measures to secure wireless protocols, WLAN and VPN networks.
5. Understand the ethical and legal issues associated with cyber crimes and be able to mitigate impact of crimes with suitable policies.
6. Use different forensic tools to acquire and duplicate data from compromised systems and analyse the same.

**Prerequisite:** Cryptography and System Security

Module No.	Unit No.	Detailed Content	Hrs
1	<b>Introduction &amp; Access Control</b>		08
	1.1	Cyber-attacks, Vulnerabilities, Defence Strategies and Techniques, Authentication Methods and Protocols, Defence in Depth Strategies.	
	1.2	Access Control Policies: DAC, MAC, Multi-level Security Models: Biba Model, Bell La Padula Model, Single Sign on, Federated Identity Management.	
2	<b>Program &amp; OS Security</b>		08
	2.1	Malicious and Non-Malicious programming errors, Targeted Malicious codes: Salami Attack, Linearization Attack, Covert Channel, Control against Program threats.	
	2.2	Operating System Security: Memory and Address protection, File Protection Mechanism, User Authentication.	
	2.3	Linux and Windows: Vulnerabilities, File System Security.	
3	<b>Web Application Security</b>		12
		OWASP, Web Security Considerations, User Authentication and Session	



		Management, Cookies, SSL, HTTPS, SSH, Privacy on Web, Web Browser Attacks, Account Harvesting, Web Bugs, Clickjacking, Cross-Site Request Forgery, Session Hijacking and Management, Phishing and Pharming Techniques, Web Service Security, OAuth 2.0	
4	<b>Wireless Security</b>		08
		Wi-Fi Security, WEP, WPA, WPA-2, Mobile Device Security- Security Threats, Device Security, GSM and UMTS Security, IEEE 802.11/802.11i Wireless LAN Security, VPN Security.	
5	<b>Legal and Ethical issues</b>		06
	5.1	Cybercrime and its types, Intellectual property, Privacy, Ethical issues.	
	5.2	Protecting Programs and Data, Information and the Law, Rights of Employees and Employers, Redress for Software Failures, Computer Crime, Ethical Issues in Computer Security, case studies of ethics.	
6	<b>Digital Forensics</b>		10
		Introduction to Digital Forensics, Acquiring Volatile Data from Windows and Unix systems, Forensic Duplication Techniques, Analysis of forensic images using open source tools like Autopsy and SIFT, Investigating logs from Unix and windows systems, Investigating Windows Registry.	

**Text Books:**

1. Computer Security Principles and Practice, William Stallings, Sixth Edition, Pearson Education
2. Security in Computing, Charles P. Pfleeger, Fifth Edition, Pearson Education
3. Network Security and Cryptography, Bernard Menezes, Cengage Learning
4. Network Security Bible, Eric Cole, Second Edition, Wiley

**Reference Books:**

1. Computer Security, Dieter Gollman, Third Edition, Wiley
2. Digital Forensics by Nilakshi Jain & Kalbande, Wiley.
3. Incident Response & Computer Forensics by Kevin Mandia, Chris Prorise, Wiley.
4. Cyber Security. Nina Godbole, Sunit Belapure, Wiley.

**Digital references:**

1. [https://www.owasp.org/index.php/Category:OWASP\\_Top\\_Ten\\_Project](https://www.owasp.org/index.php/Category:OWASP_Top_Ten_Project)

**Assessment:**

**Internal Assessment:**

Assessment consists of two class tests of 20 marks each. The first class test is to be conducted when approx. 40% syllabus is completed and second class test when additional 40% syllabus is completed. Duration of each test shall be one hour.

### **Theory Examination:**

1. Question paper will comprise of total six question.
2. All question carry equal marks
3. Questions will be mixed in nature (for example supposed Q.2 has part (a) from module 3 then part (b) will be from any module other than module 3)
4. Only Four question need to be solved.

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### **Laboratory/ Experimental Work**

**# The Experiments for this course are required to be performed and to be evaluated in CSL704: Computational Lab-1.**

#### **Lab Outcome:**

Learner will able to

1. Analyze static code and program vulnerabilities using open source tools.
2. Explore and analyze network vulnerabilities using open source tools.
3. Explore and analyze different security tools to detect web application and browser vulnerabilities.
4. Explore and analyze different tools to secure wireless networks and routers, and mobile devices and perform penetration testing, and analyze its impact.
5. Understand and implement AAA using RADIUS and TACACS.
6. Explore various forensics tools in Kali Linux and use them to acquire, duplicate and analyze data and recover deleted data.

<b>Sr. No</b>	<b>Description</b>
1	Static code analysis using open source tools like RATS, Flawfinder etc.
3	Vulnerability scanning using Nessus, Nikto (Kali Linux)
4	Explore web-application vulnerabilities using open source tools like Wapiti, browser exploitation framework (BeEf), etc.
5	Detect SQL injection vulnerabilities in a website database using SQLMap
6	Performing a penetration testing using Metasploit (Kali Linux)
7	Exploring Router and VLAN security, setting up access lists using Cisco Packet tracer(student edition)
8	Exploring VPN security using Cisco Packet tracer(student edition)
9	Exploring Authentication and access control using RADIUS, TACACS and TACACS+
10	Install and use a security app on an Android mobile (e.g. Droidcrypt)
11	Explore forensics tools in Kali Linux for acquiring, analyzing and duplicating data: dd, dcfldd, foremost, scalpel, debugfs, wireshark, tcptrace, tcpflow
12	Analysis of forensic images using open source tools like Autopsy, SIFT, FKT Imager
13	Use of steganographic tools like OpenStego, to detect data hiding or unauthorized file copying

14.	Use Password cracking using tools like John the Ripper/Cain and Abel/ Ophcrack to detect weak passwords.
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**Reference Books:**

1. Build your own Security Lab, Michael Gregg, Wiley India
2. CCNA Security, Study Guide, Tim Boyles, Sybex.
3. Web Application Hacker's Handbook, Dafydd Stuttard, Marcus Pinto, Wiley India
4. Network Infrastructure Security, Randy Waver, Dawn Weaver, Cengage Learning.
5. Incident Response & Computer Forensics by Kevin Mandia, Chris Prosis, Wiley.

**Digital References:**

<http://www.opentechinfo.com/learn-use-kali-linux/>

**T. E. Information Technology (Semester-VI)**

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract	Tut	Theory	TW/Pract	Tut	Total
ITC601	Software Engineering with Project Management	4	-	-	4	-	-	4
ITC602	Data Mining and Business Intelligence	4	-	-	4	-	-	4
ITC603	Cloud Computing & Services	4	-	-	4	-	-	4
ITC604	Wireless Networks	4	-	-	4	-	-	4
ITDLO-II	Department Level Optional Course -II	4	-	-	4	-	-	4
ITL601	Software Design Lab	-	2	-	-	1	-	1
ITL602	Business Intelligence Lab	-	2	-	-	1	-	1
ITL603	Cloud Service Design Lab	-	2	-	-	1	-	1
ITL604	Sensor Network Lab	-	2	-	-	1	-	1
ITM605	Mini-project	-	4	-	-	2	-	2
	<b>Total</b>	<b>20</b>	<b>12</b>	<b>-</b>	<b>20</b>	<b>6</b>	<b>-</b>	<b>26</b>

Course Code	Course Name	Examination Scheme								
		Theory					TW	Oral	Oral & Pract	Total
		Internal Assessment			End Sem. Exam	Exam Duration (in Hrs)				
		Test 1	Test 2	Avg.						
ITC601	Software Engineering with Project Management	20	20	20	80	3	-	-	-	100
ITC602	Data Mining and Business Intelligence	20	20	20	80	3	-	-	-	100
ITC603	Cloud Computing & Services	20	20	20	80	3	-	-	-	100
ITC604	Wireless Networks	20	20	20	80	3	-	-	-	100
ITDLO-II	Department Level Optional Course -II	20	20	20	80	3	-	-	-	100
ITL601	Software Design Lab	-	-	-	-	-	25	25	--	50
ITL602	Business Intelligence Lab	-	-	-	-	-	25	25	--	50
ITL603	Cloud Service Design Lab	-	-	-	-	-	25	25	--	50
ITL604	Sensor Network Lab	-	-	-	-	-	25	25	--	50
ITM605	Mini-Project	-	-	-	-	-	25	25	--	50
<b>Total</b>		100	100	100	400	-	125	125	--	750

#### # Department Level Optional Course (DLO)

Every student is required to take one Department Elective Course for Semester VI. Different sets of courses will run in both the semesters. Students can take these courses from the list of department electives, which are closely allied to their disciplines.

(DLO-I subjects will have no Labs only Theory)

Subject Code	Department Level Optional Course (DLO)
<b>Semester VI</b>	
ITDLO6021	Advance Internet Programming
ITDLO6022	Software Architecture
ITDLO6023	Digital Forensics
ITDLO6024	Multimedia Systems
ITDLO6025	Green IT

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Oral & Practical	Tutorial	Total
ITC601	Software Engineering with Project Management	04	--	--	04	--	--	04

Course Code	Course Name	Examination Scheme						
		Theory Marks				Term Work	Oral & Practical	Total
		Internal assessment			End Sem. Exam			
		Test1	Test2	Avg. of two Tests				
ITC601	Software Engineering with Project Management	20	20	20	80	--	--	100

**Course Objectives:** Students will try:

1. To understand the nature of software development and software life cycle process models, agile software development, SCRUM and other agile practices.
2. To Explain methods of capturing, specifying, visualizing and analyzing software requirements.
3. To understand concepts and principles of software design and user-centric approach and principles of effective user interfaces.
4. To know basics of testing and understanding concept of software quality assurance and software configuration management process.
5. To understand need of project management and project management life cycle.
6. To understand project scheduling concept and risk management associated to various type of projects.

**Course Outcomes:** Students will be able to:

1. Define various software application domains and remember different process model used in software development.
2. Explain needs for software specifications also they can classify different types of software requirements and their gathering techniques.
3. Convert the requirements model into the design model and demonstrate use of software and user-interface design principles.
4. Distinguish among SCM and SQA and can classify different testing strategies and tactics and compare them.
5. Justify role of SDLC in Software Project Development and they can evaluate importance of Software Engineering in PLC.
6. Generate project schedule and can construct, design and develop network diagram for different type of Projects. They can also organize different activities of project as per Risk impact factor.

**Prerequisite:** Programming and Networking.

**Detailed syllabus:**

Sr. No.	Module	Detailed Content	Hours	CO Mapping
0	Prerequisite	Nature of Software, Software Definition, Software Characteristics, Software Application Domains	02	
I	The Software Process	Generic view of Process; Prescriptive Models: Waterfall Model, Incremental-RAD Model, Evolutionary Process Model- Prototyping, Spiral and Concurrent Development Model, Specialized Models: Component based, Aspect Oriented Development, Agile Methodology, Scrum and Extreme Programming	07	CO1
II	Requirements Engineering and Cost Estimation	Requirement, Types of Requirements, Requirement gathering, Requirement Engineering Task, Identifying Stakeholders, Multiple viewpoints, SRS (Software Requirement Specification) Project Estimation, LOC based, FP based and Use case based estimation.	07	CO1 CO2
III	Analysis and Design Engineering	Introduction of Analysis elements, Scenario based, Flow based, behavior and class based Design Concepts and Principles, Architecture Design, Component Level Design, System Level Design, User Interface Design.	09	CO1 CO2 CO3
IV	Quality & Configuration Management	Need for Testing, Testing Tactics, Testing strategies, McCall's Quality Factor, Software Configuration Management, SCM Process	07	CO4
V	IT Project Management	Introduction, 4 P's, W5HH Principle, Need for Project Management, Project Life cycle and ITPM, Project Feasibility, RFP, PMBOK Knowledge areas, Business Case, Project Planning, Project Charter and Project Scope.	10	CO5

VI	Project Scheduling and Risk Management	WBS, Developing the Project Schedule, Network Diagrams (AON, AOA), CPM and PERT, Gantt Chart, Risk Identification, Risk Projection and RMMM	10	CO1 CO2 CO3 CO4 CO6
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#### Text Books:

1. Roger S Pressman "Software Engineering : A Practitioner's Approach" 7th Edition Mcgraw-Hill ISBN:0073375977
2. Jack T. Marchewka, "Information Technology Project Management" 4<sup>th</sup> Edition ,Wiley India

#### References:

1. "Software Engineering : A Precise Approach" Pankaj Jalote , Wiley India
2. Ian Sommerville " Software Engineering" 9th edition Pearson Education SBN-13: 978-0- 13-703515-1, ISBN-10: 0-13-703515-2
3. John M. Nicholas, Project Management for Business and Technology, 3rd edition, Pearson Education.
4. Software Project management by Bob Hughes, Mike Cotterell , Rajib Mall

#### Assessment:

##### Internal Assessment for 20 marks:

Consisting of **Two Compulsory Class Tests**

Approximately 40% to 50% of syllabus content must be covered in First test and remaining 40% to 50% of syllabus contents must be covered in second test.

**End Semester Examination:** Some guidelines for setting the question papers are as:

- Weightage of each module in end semester examination is expected to be/will be proportional to number of respective lecture hours mentioned in the syllabus.
- Question paper will comprise of total **six questions, each carrying 20 marks.**
- **Q.1 will be compulsory** and should **cover maximum contents of the syllabus.**
- **Remaining question will be mixed in nature** (for example if Q.2 has part (a) from module 3 then part (b) will be from any other module. (Randomly selected from all the modules.)
- Total **four questions** need to be solved.



**University of Mumbai**

**Program Structure B.E. Information Technology, (Rev. 2016)**

**T. E. Information Technology (Semester-V)**

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract	Tut	Theory	TW/Pract	Tut	Total
ITC501	Microcontroller and Embedded Programming	4	-	-	4	-	-	4
ITC502	Internet Programming	4	-	-	4	-	-	4
ITC503	Advanced Data Management Technology	4	-	-	4	-	-	4
ITC504	Cryptography & Network Security	4	-	-	4	-	-	4
ITDLO-I	Department Level Optional Course-I	4	-	-	4	-	-	4
ITL501	Internet Programming Lab	-	2	-	-	1	-	1
ITL502	Security Lab	-	2	-	-	1	-	1
ITL503	OLAP Lab	-	2	-	-	1	-	1
ITL504	IOT (Mini Project) Lab	-	2	-	-	1	-	1
ITL505	Business Communication and Ethics	-	2+2*	-	-	2	-	2
	<b>Total</b>	<b>20</b>	<b>14</b>	<b>-</b>	<b>20</b>	<b>7</b>	<b>-</b>	<b>26</b>

Course Code	Course Name	Examination Scheme								
		Theory					TW	Oral	Oral & Pract	Total
		Internal Assessment			End Sem. Exam	Exam Duration (in Hrs)				
		Test 1	Test 2	Avg.						
ITC501	Microcontroller and Embedded Programming	20	20	20	80	3	-	-	100	
ITC502	Internet Programming	20	20	20	80	3	-	-	100	
ITC503	Advanced Data Management Technology	20	20	20	80	3	-	-	100	
ITC504	Cryptography & Network Security	20	20	20	80	3	-	-	100	
ITDLO-I	Department Level Optional Course-I	20	20	20	80	3	-	-	100	
ITL501	Internet Programming Lab	-	-	-	-	-	25	-	25	50
ITL502	Security Lab	-	-	-	-	-	25	25	-	50
ITL503	OLAP Lab	-	-	-	-	-	25	25	-	50

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Oral & Practical	Tutorial	Total
ITC504	Cryptography & Network Security	04	--	--	04	--	--	04

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Oral & Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test 1	Test2	Avg. of two Tests					
ITC504	Cryptography & Network Security	20	20	20	80	--	--	--	100

**Course Objectives:** Students will try to learn:

1. The concepts of classical encryption techniques and concepts of finite fields and number theory.
2. And explore the working principles and utilities of various cryptographic algorithms including secret key cryptography, hashes and message digests, and public key algorithms
3. And explore the design issues and working principles of various authentication protocols, PKI standards.
4. And explore various secure communication standards including Kerberos, IPsec, and SSL/TLS and email.
5. The ability to use existing cryptographic utilities to build programs for secure communication.
6. The concepts of cryptographic utilities and authentication mechanisms to design secure applications

**Course Outcomes:** Students will be able to:

1. Identify information security goals, classical encryption techniques and acquire fundamental knowledge on the concepts of finite fields and number theory.
2. Understand, compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication
3. Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes
4. Apply different digital signature algorithms to achieve authentication and create secure applications
5. Apply network security basics, analyze different attacks on networks and evaluate the performance of firewalls and security protocols like SSL, IPSec, and PGP.
6. Apply the knowledge of cryptographic utilities and authentication mechanisms to design secure applications

**Prerequisite:** Computer Networks

**Detailed syllabus:**

Sr No	Module	Detailed Content	Hours	CO Mapping
0	Prerequisites	Basic concepts of OSI Layer	02	--
I	Introduction & Number Theory	Services, Mechanisms and attacks-the OSI security architecture-Network security model-Classical Encryption techniques (Symmetric cipher model, mono-alphabetic and poly-alphabetic substitution techniques: Vignere cipher, playfair cipher, Hill cipher, transposition techniques: keyed and keyless transposition ciphers, steganography).	09	CO1
II	Block Ciphers & Public Key Cryptography	Data Encryption Standard-Block cipher principles-block cipher modes of operation-Advanced Encryption Standard (AES)-Triple DES-Blowfish-RC5 algorithm.  Public key cryptography: Principles of public key cryptosystems-The RSA algorithm, The knapsack algorithm, El-Gamal Algorithm  Key management – Diffie Hellman Key exchange	09	CO2 CO6
III	Cryptographic Hashes, Message Digests and Digital Certificates	Authentication requirement – Authentication function, Types of Authentication, MAC – Hash function – Security of hash function and MAC –MD5 – SHA – HMAC – CMAC,  Digital Certificate: X.509, PKI	09	CO3
IV	Digital signature schemes and authentication Protocols	Digital signature and authentication protocols : Needham Schroeder Authentication protocol, Digital Signature Schemes – RSA, El Gamal and Schnorr, DSS,	07	CO4
V	Network Security	Network security basics: TCP/IP vulnerabilities (Layer wise), Packet Sniffing, ARP spoofing, port scanning, IP spoofing, TCP syn flood, DNS Spoofing, Denial of Service: Classic DOS attacks, Source Address spoofing, ICMP flood, SYN flood, UDP flood, Distributed Denial of Service, Defenses against Denial of Service Attacks.	10	CO5

		Firewalls, Intrusion Detection Systems: Host Based and Network Based IDS, Honey pots.		
VI	Network Security Applications	Authentication Applications, Kerberos, Internet Security Protocols: SSL, TLS, IPSEC:AH, ESP, Secure Email: PGP and S/MIME, Key Management.	06	CO5 CO6

#### Text Books:

1. Mark Stamp's Information Security Principles and Practice, Wiley
2. William Stallings, Cryptography and Network Security, Principles and Practice, 6<sup>th</sup> Edition, Pearson Education, March 2013
3. Belrouz A. Ferouzan, "Cryptography & Network Security", Tata Mc Graw Hill
4. Bernard Menezes, "Cryptography & Network Security", Cengage Learning

#### Reference Books:

1. Applied Cryptography, Protocols Algorithms and Source Code in C, Bruce Schneier, Wiley.
2. Cryptography and Network Security, Atul Kahate, Tata Mc Graw Hill.

#### Assessment:

##### Internal Assessment for 20 marks:

Consisting of **Two Compulsory Class Tests**

Approximately 40% to 50% of syllabus content must be covered in First test and remaining 40% to 50% of syllabus contents must be covered in second test.

**End Semester Examination:** Some guidelines for setting the question papers are as:

- Weightage of each module in end semester examination is expected to be/will be proportional to number of respective lecture hours mentioned in the syllabus.
- Question paper will comprise of total **six questions, each carrying 20 marks.**
- **Q.1 will be compulsory** and should **cover maximum contents of the syllabus.**
- **Remaining question will be mixed in nature** (for example if Q.2 has part (a) from module 3 then part (b) will be from any other module. (Randomly selected from all the modules.)
- Total **four questions** need to be solved.

Course Code	Course Name	Examination Scheme								
		Theory					TW	Oral	Oral & Pract	Total
		Internal Assessment			End Sem. Exam	Exam Duration (in Hrs)				
		Test 1	Test 2	Avg.						
ITC701	Enterprise Network Design	20	20	20	80	3	-	-	100	
ITC702	Infrastructure Security	20	20	20	80	3	-	-	100	
ITC703	Artificial Intelligence	20	20	20	80	3	-	-	100	
ITDLO-II	Department Level Optional Course -III	20	20	20	80	3	-	-	100	
ILO-I	Institute Level Optional Course-I	20	20	20	80	3	-	-	100	
ITL701	Network Design Lab	-	-	-	-	-	25	25	--	50
ITL702	Advanced Security Lab	-	-	-	-	-	25	25	--	50
ITL703	Intelligence System Lab	-	-	-	-	-	25	25	--	50
ITL704	Android Apps Development Lab						25	25	--	25
ITM705	Project-I	-	-	-	-	-	50	25	--	75
<b>Total</b>		100	100	100	400		150	125	--	750

#### # Department Level Optional Course (DLO)

Every student is required to take one Department Elective Course for Semester VII. Different sets of courses will run in both the semesters. Students can take these courses from the list of department electives, which are closely allied to their disciplines.

(DLO-I subjects will have no Labs only Theory)

#### # Institute Level Optional Course (ILO)

Every student is required to take one Institute Elective Course for Semester VII, which is not closely allied to their disciplines. Different sets of courses will run in the both the semesters.

Subject Code	Department Level Optional Course (DLO)	Subject Code	Institute Level Optional Course (ILO)
<b>Semester VII</b>			
ITDLO7031	Storage Area Networks	ILO7011	Product Lifecycle Management
ITDLO7032	Mobile Application Development	ILO7012	Reliability Engineering
ITDLO7033	High Performance Computing	ILO7013	Management Information System
ITDLO7034	Software Testing and Quality Assurance	ILO7014	Design of Experiments
ITDLO7035	Soft Computing	ILO7015	Operation Research
		ILO7016	Cyber Security and Laws
		ILO7017	Disaster Management and Mitigation Measures
		ILO7018	Energy Audit and Management
		ILO7019	Development Engineering

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Practical/Oral	Tutorial	Total
ITC702	Infrastructure Security	04	--	-	04	--	-	04

Course Code	Course Name	Examination Scheme							
		Theory Marks				End Sem. Exam	Term Work	Oral & Practical	Total
		Internal assessment			Avg. of two Tests				
		Test1	Test2						
ITC702	Infrastructure Security	20	20	20	80	--	--	100	

**Course Objectives:** Students will try :

1. To understand underlying principles of infrastructure security
2. To explore software vulnerabilities, attacks and protection mechanisms  
To learn security aspects of wireless network infrastructure and protocols
3. To investigate web server vulnerabilities and their countermeasures
4. To develop policies for security management and mitigate security related risks in the organization
5. To Learn the different attacks on Open Web Applications and Web services.
6. To Learn the different security policies.

**Course Outcomes:** Students will be able to:

1. Understand the concept of vulnerabilities, attacks and protection mechanisms
2. Analyze and evaluate software vulnerabilities and attacks on databases and operating systems
3. Explain the need for security protocols in the context of wireless communication
4. Understand and explain various security solutions for Web and Cloud infrastructure
5. Understand, and evaluate different attacks on Open Web Applications and Web services
6. Design appropriate security policies to protect infrastructure components

**Prerequisite:** Computer Networks, Cryptography and Network Security

**Detail Syllabus:**

Sr. No.	Module	Detailed Content	Hours	CO Mapping
I	Introduction	Cyber-attacks, Vulnerabilities, Defense Strategies and Techniques, Authentication Methods- Password, Token and Biometric, Access Control Policies and Models (DAC, MAC, RBAC, ABAC, BIBA, Bell La Padula), Authentication and Access Control Services- RADIUS, TACACS, and TACACS+	6	CO1

II	Software Security	<p><b>Software Vulnerabilities:</b></p> <p>Buffer overflow, Format String, Cross-Site Scripting, SQL Injection, Malware: Viruses, Worms, Trojans, Logic Bomb, Bots, Rootkits</p> <p><b>Operating System Security:</b></p> <p>Memory and Address Protection, File Protection Mechanism, User Authentication.</p> <p>Linux and Windows: Vulnerabilities, File System Security</p> <p><b>Database Security:</b></p> <p>Database Security Requirements, Reliability and Integrity, Sensitive Data, Inference Attacks, Multilevel Database Security</p>	12	CO2
III	Wireless Security	Mobile Device Security- Security Threats, Device Security, GSM, UMTS and 4G Security, IEEE 802.11xWireless LAN Security, VPN Security, Wireless Intrusion Detection System (WIDS)	9	CO3
IV	Cloud Security	Cloud Security Risks and Countermeasures, Data Protection in Cloud, Cloud Application Security, Cloud Identity and Access Management, Cloud Security as a Service, SAML, OAuth	8	CO4
V	Web Security	Web Security Considerations, User Authentication and Session Management, Cookies, SSL, HTTPS, SSH, Privacy on Web, Web Browser Attacks, Account Harvesting, Web Bugs, Clickjacking, Cross-Site Request Forgery, Session Hijacking and Management, Phishing and Pharming Techniques, DNS Attacks, Web Service Security, Secure Electronic Transaction, Email Attacks, Web Server Security as per OWASP, Firewalls, Penetration Testing	12	CO4, CO5
VI	Information Security and Risk Management	Security Policies, Business Continuity Plan, Risk Analysis, Incident Management, Legal System and Cybercrime, Ethical Issues in Security Management	5	CO6



**Text Books:**

1. Computer Security Principles and Practice, William Stallings, Sixth Edition, Pearson Education
2. Security in Computing, Charles P. Pileeger, Fifth Edition, Pearson Education
3. Network Security and Cryptography, Bernard Menezes, Cengage Learning
4. Network Security Bible, Eric Cole, Second Edition, Wiley

**Reference Books:**

1. Web Application Hackers Handbook by Wiley.
2. Computer Security, Dieter Gollman, Third Edition, Wiley
3. CCNA Security Study Guide, Tim Boyle, Wiley
4. Introduction to Computer Security, Matt Bishop, Pearson.
5. Cloud Security and Privacy, Tim Mather, Subra Kumaraswamy, Shated Latif, O'Riely

**Assessment:****Internal Assessment for 20 marks:****Consisting of Two Compulsory Class Tests**

Approximately 40% to 50% of syllabus content must be covered in First test and remaining 40% to 50% of syllabus contents must be covered in second test.

**End Semester Examination:** Some guidelines for setting the question papers are as:

- Weightage of each module in end semester examination is expected to be/will be proportional to number of respective lecture hours mentioned in the syllabus.
- Question paper will comprise of total **six questions, each carrying 20 marks.**
- **Q.1 will be compulsory** and should **cover maximum contents of the syllabus.**
- **Remaining question will be mixed in nature** (for example if Q.2 has part (a) from module 3 then part (b) will be from any other module. (Randomly selected from all the modules.)
- Total **four questions** need to be solved.

Course Code	Course Name	Credits
ILO7013	Management Information System	03

**Objectives:**

1. The course is blend of Management and Technical field.
2. Discuss the roles played by information technology in today's business and define various technology architectures on which information systems are built
3. Define and analyze typical functional information systems and identify how they meet the needs of the firm to deliver efficiency and competitive advantage
4. Identify the basic steps in systems development

**Outcomes:** Learner will be able to...

1. Explain how information systems Transform Business
2. Identify the impact information systems have on an organization
3. Describe IT infrastructure and its components and its current trends
4. Understand the principal tools and technologies for accessing information from databases to improve business performance and decision making
5. Identify the types of systems used for enterprise-wide knowledge management and how they provide value for businesses

Module	Detailed Contents	Hrs
01	Introduction To Information Systems (IS): Computer Based Information Systems, Impact of IT on organizations, Importance of IS to Society, Organizational Strategy, Competitive Advantages and IS.	4
02	Data and Knowledge Management: Database Approach, Big Data, Data warehouse and Data Marts, Knowledge Management. Business intelligence (BI): Managers and Decision Making, BI for Data analysis and Presenting Results	7
03	Ethical issues and Privacy: Information Security, Threat to IS, and Security Controls	7
04	Social Computing (SC): Web 2.0 and 3.0, SC in business-shopping, Marketing, Operational and Analytic CRM, E-business and E-commerce – B2B B2C. Mobile commerce.	7
05	Computer Networks Wired and Wireless technology, Pervasive computing, Cloud computing model.	6
06	Information System within Organization: Transaction Processing Systems, Functional Area Information System, ERP and ERP support of Business Process. Acquiring Information Systems and Applications: Various System development life cycle models.	8

**Assessment:**

**Internal:**

Assessment consists of two tests out of which; one should be compulsory class test and the other is either a class test or assignment on live problems or course project.

**End Semester Theory Examination:**

Some guidelines for setting up the question paper. Minimum 80% syllabus should be covered in question papers of end semester examination. **In question paper weightage of each module will be proportional to number of respective lecture hours as mention in the syllabus.**

1. Question paper will comprise of total six question
2. All question carry equal marks
3. Questions will be mixed in nature (for example supposed Q.2 has part (a) from module 3 then part (b) will be from any module other than module 3)
4. Only Four question need to be solved.

**REFERENCES:**

1. Kelly Rainer, Brad Prince, Management Information Systems, Wiley
2. K.C. Laudon and J.P. Laudon, Management Information Systems: Managing the Digital Firm, 10<sup>th</sup> Ed., Prentice Hall, 2007.
3. D. Boddy, A. Boonstra, Managing Information Systems: Strategy and Organization, Prentice Hall, 2008

## TEDxCRCE

TEDxCRCE allows our stage to host personalities who have sheer passion to have an impact on our society be it political, social, technological or cultural. The speakers share their belief in their ideas which allow them to move the masses, the extent of their success and the evolution / termination of their ideas in due course due to the constant changes taking place worldwide. In addition to this, this chapter organizes technical activities like Internship expo and resumes building session. Further the council is also involved in various events related to social work through Community Services like Volunteering drive, Food Rescue Operation.

### **List of TEDxCRCE council members 2020-21**

<b>Name of student</b>	<b>Post</b>	<b>Class</b>
Renjit Koshy	Organizer	BE ELECTRONICS
Pragati Rao	Curator	BE ELECTRONICS
Meera Ghaskadvi	Director	BE IT
Gladden Rumao	Co-organizer	TE COMPUTERS
Prisha Sharma	General Administration Head	TE ELECTRONICS
Sylvester Rodrigues	Marketing and Sponsorship Head	TE ELECTRONICS
Clafacio Lobo	Internship Expo Head	TE IT
Kartik Salian	PR and Media Head	TE ELECTRONICS
Warren Fernandes	Jr. Technical Head	SE COMPS B
Amrutha Sureshkumar	Jr. PR Head	SE COMPS B
Mufaddal Rangwala	Jr. PR Head	SE ECS
Candida Noronha	Jr. Design Head	SE COMPS B
Jyothis Shajan	Jr. Design Head	SE ECS
Insiya Shamshi	Jr. Marketing Head	SE COMPS B
Lizel Fernandes	Jr. Documentation Head	SE COMPS B

### **List of activities conducted 2020-21**

<b>Sr. No</b>	<b>Activity/seminar /session</b>	<b>Short information</b>	<b>Speaker/Judges Details</b>	<b>Date/ Duration</b>	<b>Number of students Participated</b>
1	Divulge	Social Media Campaign – DIVULGE, commending students achievement in the lockdown of 2020	-	September 2020	6 candidates selected
2.	TEDxCRCE 2020 Shifting Gears	An online TEDx event hosting live TED-like talks from speakers of various genres presenting the idea “Shifting Gears”	Mrs. Apurva Purohit(Business), Mrs. Triveni Acharya(Social Work), Dr. Vikas Karade(Innovation), Mrs. Shibani Kashyap(Bollywood	7 <sup>th</sup> November 2020	100

			Music), Mr. D.R. Karthikeyan(Public Servant), Rhythm Funk (Music)		
3.	Resume Building Session	Event to teach current students tricks to make a good resume.	Mr. Gopesh Rajderkar , Alumni BE Computers, 2019	27 <sup>th</sup> February 2021	200+
4.	Internship Expo 2021	The Internship & Career Expo is CRCE's flagship event hosting 23 companies from technical as well as non technical domains that help students to get Internships opportunities	Companies Visited: Kasa Kai Mumbai, Skynet Secure, Cloud Counselage, Gift a Career, 20 watts, Roti Bank, Blended Learning, Itech Solutions, Pixel Dust, Welfare of the Stray Dogs, Amcha Ghar, Binary Curve, Ratna Nidhi, Baheti, Ashish Foundation, Web Shine Tech, Green Gen, Citizens Association For Child Rights, Cleverspace, Online Manufacturing, Cyber frat, Syspre and Derest	6 <sup>th</sup> March 2021	300+

PHOTOS:



**TEDxCRCE** **DIVULGE** **f t i s**  
www.tedxcrce.com

**Engineer by profession,  
cricket enthusiast at heart!**

- Owner of the page *Cricblogs* on Instagram
- Posts facts, blogs, Opinion polls, quizzes on the page
- Received engagement from eminent celebrities like Gaurav Kapoor, Randeep Jhaav and Jatin Supra

- *Nachiket Nisal*  
BE, IT



**TEDxCRCE** **DIVULGE** **f t i s**  
www.tedxcrce.com

**CS Engineer turned Stock Market Trader**

- Built automated trading system via computer programming
- Earns more than an average IT professional by investing in stock markets
- Runs a channel on Instagram by the name of *Aman Baheti* where he posts about stock market predictions, smart investments and profit generations

- *Aman Baheti*  
BE, Computer Science



**TEDxCRCE** **DIVULGE** **f t i s**  
www.tedxcrce.com

**Engineer by profession,  
Artist by Passion!**

- Was featured by a reputed institute and got a chance to present her glass paintings.
- Just within a month of branding, received an appreciable response.
- Runs an Instagram page *'rid.glassopol'* where she posts glass paintings made by her.

- *Rishi Banerjee*  
BE, IT



**TEDxCRCE** **DIVULGE** **f t i s**  
www.tedxcrce.com

**Professional Dancer with her own  
YouTube Channel!**

- Professionally trained dancer
- Started a YouTube channel with the name *"NUSTA NAACH"*
- Viewership of more than 1.2k views on her videos.

- *Khushboo Golampalle*  
BE, Elex



**TEDxCRCE** **DIVULGE** **f t i s**  
www.tedxcrce.com

**It all begins with a  
STEP TOWARDS HUMANITY!**

- Learnt stitching, stitched masks and distributed them to the needy
- Took responsibility of spreading awareness about social distancing in my locality
- Instructed yoga to live a healthy life while sitting at home

- *Rishika Varsh*  
SE, Comps B













[www.tedxcrce.com](http://www.tedxcrce.com)

**TED<sup>x</sup>CRCE**

x = independently organized TED event

# RESUME BUILDING WORKSHOP



**27th Feb, 2021  
2:30 pm**

**Gopesh Rajderkar**

**Software Developer | TCS Digital**



**TEDxCRCE**  
A TEDx event by CRCE at the PCCO

# INTERNSHIP EXPO 2021

Venue: Zoom  
6th March, 2021  
10:30 am onwards

Contact:  
Clafacio : 9309816876  
Kartik : 7303111089

www.tedcrce.com

Scan to Register

The poster features a dark blue background with a laptop, a smartphone, a cup of coffee, and a notebook. At the bottom, there are social media icons for Facebook, Instagram, and YouTube, along with a QR code.







## **Report of Workshop /Lecture on - Innovation and IPR Process**

<b>Speaker</b>	: Dr S.N. Teli
<b>Date of Event</b>	:15/04/2021
<b>Duration</b>	: 2 Hours
<b>Organised by</b>	: IPR Cell of Fr. CRCE in association with our Institute Innovation Council IIC-Fr. CRCE
<b>Total Number of Participants</b>	:89 (80 Students+9 Faculty)
<b>Mode of Session</b>	: Online through google meet

### **Objective of Program**

Objective of the program was to introduce participants to the world of IPR and Innovations. Main objective here was to make participants aware of Patent and other IPR filing procedures.

### **Contents of the Program**

This session enabled participants to understand the IPR and Innovation process as well as formal procedure to file an IPR.

Dr. S N Teli explained various types of intellectual properties at the beginning of the session. Subsequently, he explained the procedure for filing IPR and cost involved in the process. He demonstrated the stepwise procedure for filing patent using 'ipindia' – the official website of Intellectual Property India. The participants were benefited by the knowledge shared by the expert regarding practical approach and formalities to be completed in filing the IPR. The participants also received in detail information about the role of IP office authorities and the documentation format and content expected by them. The participants asked several questions during Q&A session to clear their doubts regarding innovation and novelty required for an idea to be worth patentable.

The program was successful in developing an understanding among the participants about formal procedure and requisites to file patent and other IPRs.

### **Outcomes**

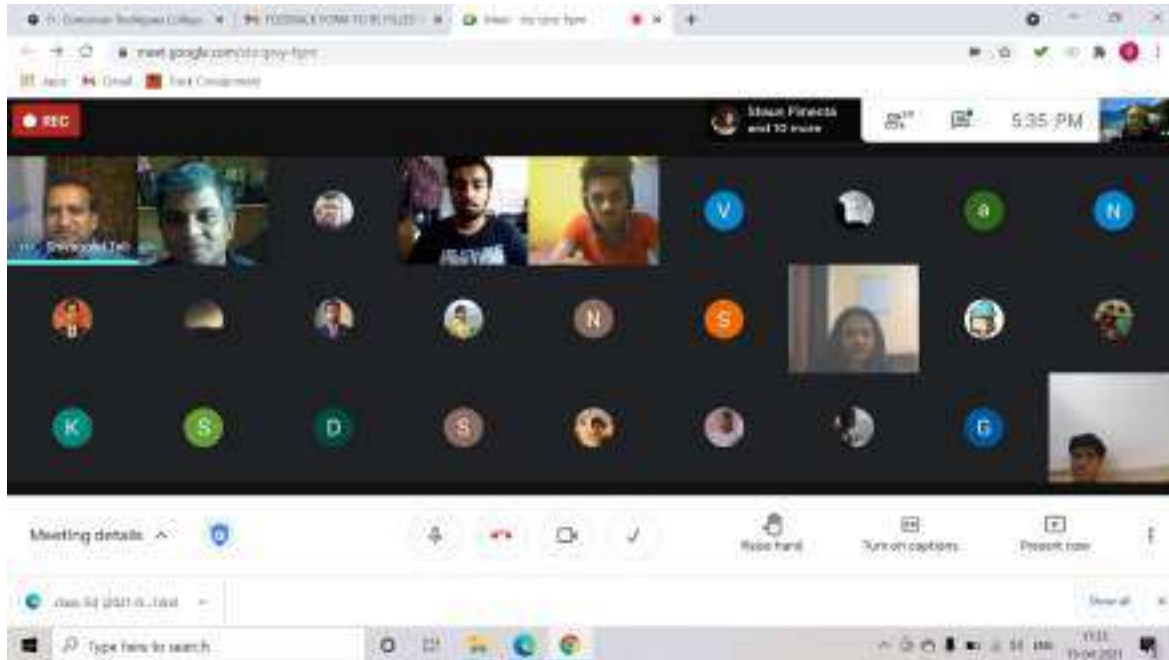
Participants were able to understand fundamentals of IPR and Innovation Process. After attending session participants have understood formal procedure to file patent and other IPR



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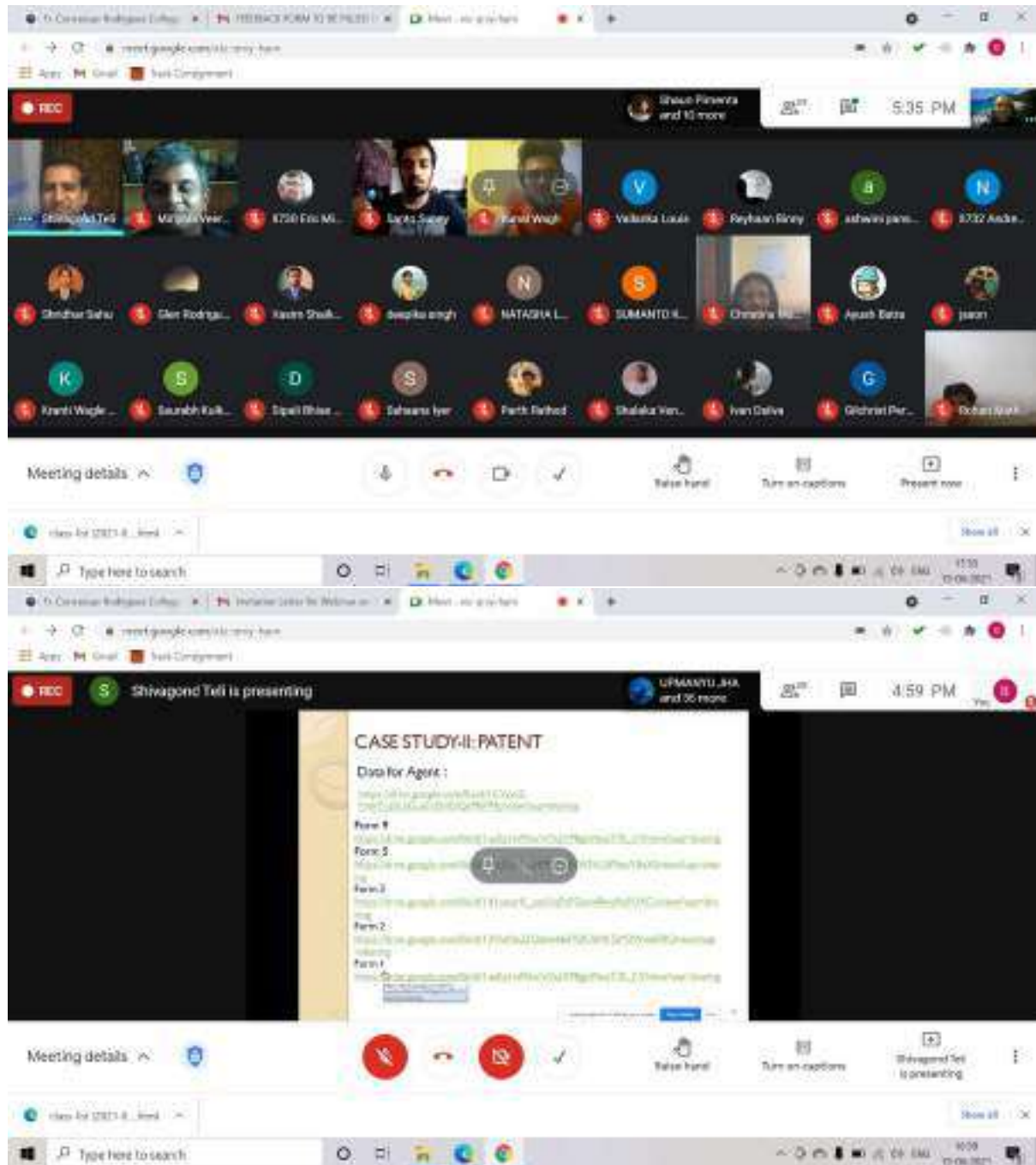


## Photographs of Event





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Fr. Agnel Ashram, Bandstand, Bandra (W), Mumbai – 400 050





**Meeting 1: CASE STUDY-II: PATENT**

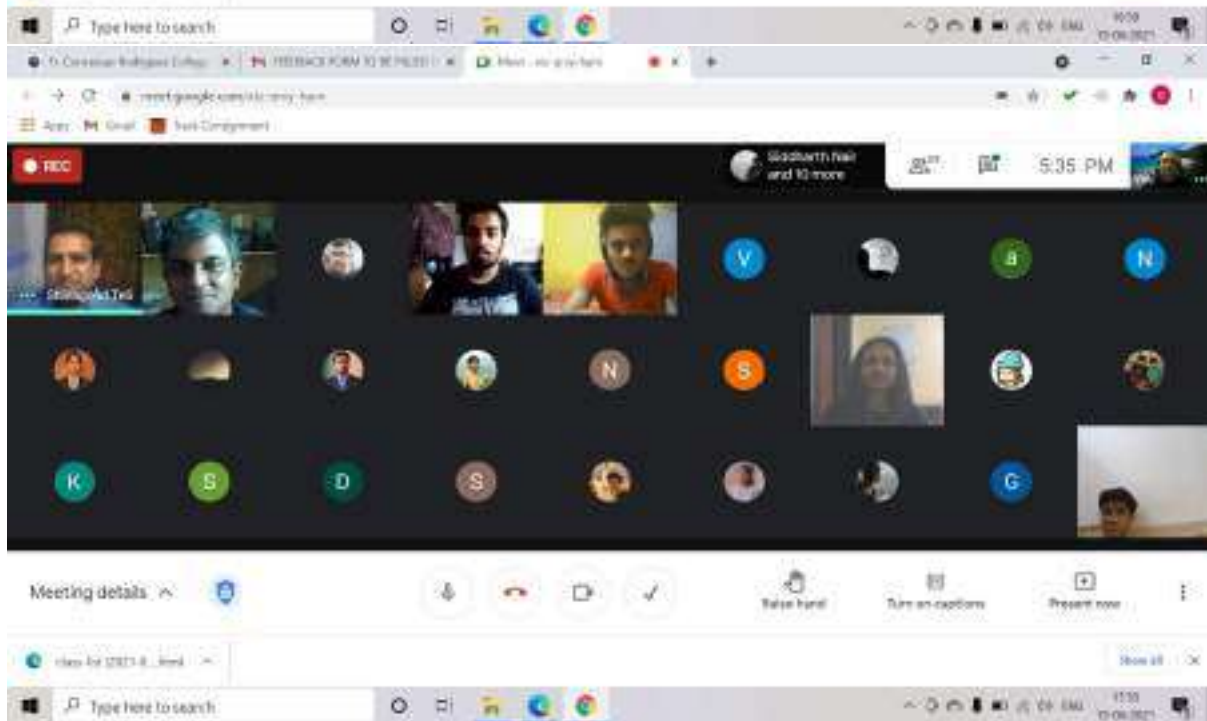
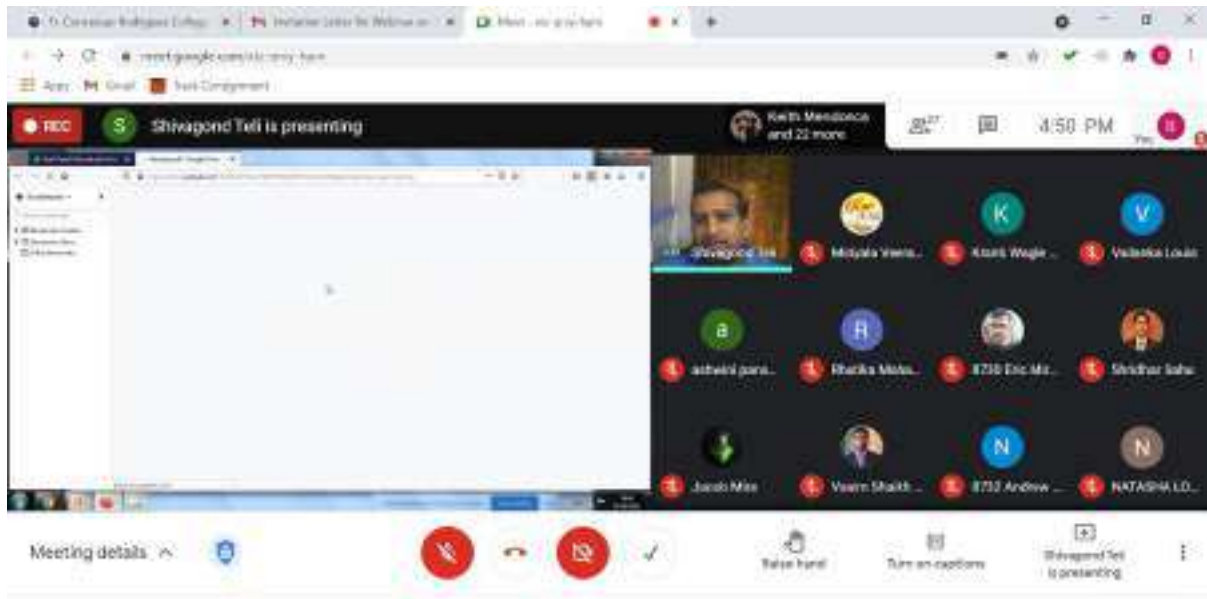
Data for Agent :

- Form 1: <https://drive.google.com/file/d/1T4UjU1tX19tE00DQ4R9PmUo3uXq2w/view>
- Form 2: <https://drive.google.com/file/d/1EzU8tZq178d2D9YUz7Pw1W4K8vz9v6/view>
- Form 3: <https://drive.google.com/file/d/1L2U4Gz178d2D9YUz7Pw1W4K8vz9v6/view>
- Form 4: <https://drive.google.com/file/d/1T4UjU1tX19tE00DQ4R9PmUo3uXq2w/view>
- Form 5: <https://drive.google.com/file/d/1T4UjU1tX19tE00DQ4R9PmUo3uXq2w/view>
- Form 6: <https://drive.google.com/file/d/1T4UjU1tX19tE00DQ4R9PmUo3uXq2w/view>
- Form 7: <https://drive.google.com/file/d/1T4UjU1tX19tE00DQ4R9PmUo3uXq2w/view>
- Form 8: <https://drive.google.com/file/d/1T4UjU1tX19tE00DQ4R9PmUo3uXq2w/view>
- Form 9: <https://drive.google.com/file/d/1T4UjU1tX19tE00DQ4R9PmUo3uXq2w/view>

**Meeting 2: CASE STUDY-I: DESIGN PATENT**

- Step 1: Filed Application (Applicant) & send to Agent  
<https://drive.google.com/file/d/1T4UjU1tX19tE00DQ4R9PmUo3uXq2w/view>
- Step 2: Power of Attorney send to Agent (Applicant)  
<https://drive.google.com/file/d/1EzU8tZq178d2D9YUz7Pw1W4K8vz9v6/view>
- Step 3: Filing to Patent office (Agent)  
<https://drive.google.com/file/d/1L2U4Gz178d2D9YUz7Pw1W4K8vz9v6/view>
- Step 4: Payment Receipt (Agent) Cash/Bank Receipt(CRR)  
<https://drive.google.com/file/d/1T4UjU1tX19tE00DQ4R9PmUo3uXq2w/view>
- Step 5: Issue of Design patent





**List of Participants:**

Sr No	Name	Student	Faculty
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1	Aditya Kamble	Y	
2	Andrew Noronha	Y	
3	Ankur Yogi	Y	
4	Eric Miranda	Y	
5	Niraj Jain	Y	
6	Shubh Karani	Y	
7	Vaibhav Shah	Y	
8	Aaron Dsouza	Y	
9	Aditya Punjabi	Y	
10	Aiden Samuel	Y	
11	Allen Pinto	Y	
12	Allen Xavier	Y	
13	Amit Dubey	Y	
14	Amogh Manikoth	Y	
15	Andan Diwan	Y	
16	Anmol Kamoji	Y	
17	Anosh _	Y	
18	Anshula Raina	Y	
19	Antinni Joseph	Y	
20	Aryan Dali	Y	
21	Ashwini Pansare	Y	
22	Astle Colaco	Y	
23	Ayush Batra	Y	
24	Bhushan Patil Crce	Y	
25	Bhushan Salunke	Y	
26	Charit Save	Y	
27	Christina Maria Tomy	Y	
28	Christopher Roach	Y	
29	Cliff Lopes	Y	
30	Crce Cyril Varghese	Y	
31	Darren Lopes	Y	
32	Deepika Singh		Y
33	Dipali Bhise Crce		Y
34	Dipali Koshti		Y
35	Dnyaneshwari Shinde	Y	
36	Gilchrist Pereira	Y	
37	Glen Rodrigues	Y	
38	Grace Pereira	Y	
39	Hasnain Khan	Y	



**FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING**  
**Fr. Agnel Ashram, Bandstand, Bandra (W), Mumbai - 400 050**



40	Ivan Dsilva	Y	
41	Jacob Mire	Y	
42	Janmanjay Chakra	Y	
43	Jason	Y	
44	Keith Mendonca	Y	
45	Kranti Wagle Crce	Y	
46	Kunal Wagh	Y	
47	Kyle Dsouza	Y	
48	Lauren Menezes	Y	
49	Lavil Saldanha	Y	
50	Lemmie Carvalho	Y	
51	Meera Kokate	Y	
52	Meet Shah	Y	
53	Miriyala Veerabhadrrao D. N. Fr. Conceicao Rodrigues College		Y
54	Mohit Pansare	Y	
55	Natasha Lobo	Y	
56	Nealon Dcruz	Y	
57	Omkar Govardhan	Y	
58	Parth Rathod	Y	
59	Pooja Banjan	Y	
60	Pravin Nerpagar	Y	
61	Reuel Gracias	Y	
62	Reyhaan Binny	Y	
63	Rhutika Mahadik	Y	
64	Rohan Mathew	Y	
65	Sahaana Iyer	Y	
66	Sahil Purohit	Y	
67	Samyak Bobde	Y	
68	Sangeeta Parshionikar	Y	
69	Sanskriti Sabban	Y	
70	Santo Sunny	Y	
71	Saurabh Kulkarni Crce		Y
72	Shalaka Vengurlekar	Y	
73	Shaun Pimenta	Y	
74	Shridhar Sahu	Y	
75	Shubham Parab	Y	
76	Siddharth Nair	Y	
77	Sripad Kartha	Y	



FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING  
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78	Sujata Deshmukh	Y	
79	Sumanto Kar	Y	
80	Sunilkumar Pillai	Y	
81	Sushman Crce		Y
82	Swapnali Makdey		Y
83	Swati Ringe		Y
84	Tyrone Pereira	Y	
85	Upmanyu Jha	Y	
86	Vailanka Louis	Y	
87	Vasim Shaikh Crce		Y
88	Vedang Chavan	Y	
89	Yash Raj Malani	Y	
	<b>Total</b>	<b>80</b>	<b>9</b>

Dr Bhushan Patil

Dean (Research and Development)

Fr.CRCE,Bandra

# 'MENTORING TOWARDS PREPARATION FOR PLACEMENTS & FUTURE CAREERS IN I.T. INDUSTRY'

BY

**CHUNDELIKATT NOEL JAYMON**

**Chatbot Engineer**

**Quantiphi Analytics Solutions Pvt. Ltd.**

**Friday, 23<sup>rd</sup> October 2020**

RANKINGS **nirf** AFFILIATION **THE WEBER EducationWorld** ACCREDITATIONS **NBA** APPROVALS

**ELECTRONICS & COMPUTER SCIENCE (ECS)**

**Heartiest Congratulations to  
CHUNDELIKATT NOEL JAYMON  
For Placement Selection @**

**quantiphi**

**B.E. (Electronics Engineering)  
Academic Year of 2019 – 2020**

**CHUNDELIKATT  
NOEL JAYMON**  
Chat Box  
Engineer  
(CE)

@ecs.frcrce @ecs.frcrce @ecs.frcrce @ecs.frcrce @ecs.frcrce


Fr. Agnel Ashram, Bandstand, Bandra (W), Mumbai – 400050.  
www.frcrce.ac.in / +91-22-67114111 / ecs.frcrce@gmail.com

**Initiative by Jayen Modi, Assistant Professor,  
Department of Electronics & Computer Science  
Fr. Conceicao Rodrigues College of Engineering**



## REPORT ON GUEST LECTURE BY INDUSTRY EXPERT

### 1. Overview & Details

<b>Guest Lecture Title</b>	Mentoring Towards Preparation for Placements & Future Careers in IT Industry by Chundelikatt Noel Jaymon	
<b>Venue / Location</b>	Google Meet Platform (Online) <a href="https://meet.google.com/cnz-esgt-och">https://meet.google.com/cnz-esgt-och</a>	
<b>Activity Organizer &amp; Co-ordinator</b>	Jayen Modi, Assistant Professor Department of Electronics & Computer Science Fr. Conceicao Rodrigues College of Engineering	
<b>Day, Date &amp; Timings</b>	Friday, 23 <sup>rd</sup> October 2020 – 12:30 pm to 01:45 pm IST	
<b>Brief Background of Guest Speaker / Resource Person</b>	Chundelikatt Noel Jaymon is an alumnus of the Department of Electronics Engineering at Fr. Conceicao Rodrigues College of Engineering from academic year of 2019 – 2020. He currently is working as a chatbot engineer at Quantiphi Analytics Solutions.	
<b>Intended / Target Audience</b>	S.E. (Electronics & Computer Science) – Semester III	
<b>Motivation &amp; Objective of the Guest Lecture (Talk)</b>	The objective of this talk is to enlighten & motivate the students of the Electronics & Computer Science discipline to explore technological avenues of the future & to gear up for challenges. He wishes to connect with target audience by describing his own journey as engineering student, a fresher, an intern & later a professional. Noel explained in detail the skills one needs to develop to meet the requirements of Industry 4.0 & also suggested some of domains such as artificial intelligence, machine learning, cyber security etc. that could have tremendous scope in the near future. Noel also stressed on the need to be very well versed with coding & knowledge of programming languages such as C/C++, Java & Python. Finally, he concluded by advising all students to take experience from internships.	
<b>Contents of Guest Lecture by Resource Person</b>	<ul style="list-style-type: none"> <li>• Competitive coding</li> <li>• Importance of internships</li> <li>• Resume building tips</li> <li>• Networking on LinkedIn</li> <li>• Opportunities &amp; job prospects in IT for Industry 4.0</li> </ul>	
<b>Google Meet Recording Link of Guest Lecture (Talk)</b>	<a href="https://drive.google.com/file/d/1_EUs1pJzNnmlYWJh10QWkWPczDQsEPkJ/view?usp=sharing">https://drive.google.com/file/d/1_EUs1pJzNnmlYWJh10QWkWPczDQsEPkJ/view?usp=sharing</a>	

# Daily Attendance Report for S.E. (ECS): 2020-10-23

Show Attendance Summary



Class: S.E. (ECS) Meet ID: cnz-esgt-och Date: 2020-10-23 Earliest Arrival(s): 12:23 Start Time: 12:23 End Time: 13:38 Length of Meet: 75 min

**Class Notes:**

Guiding & mentoring for S.E. (ECS) students towards preparation for placements and/or future careers by Chundelikatt Noel Jaymon of B.E. (Electronics Engineering

37 Names ( 0 Absent) ☆	12:20	12:23	12:25	12:30	12:35	12:40	12:45	12:50	12:55	13:00	13:05	13:10	13:15
✓ Abhishek Bhattacharjee													
✓ Anushka Bobade													
✓ Sherwin D'souza													
✓ Adroit Dsouza													
✓ Jeshurun Edwin													
✓ Brycen Fernandes													
✓ Migael Francis													
✓ Mayur Gurav [8996]													
✓ Noel Jaymon													
✓ Max Johnson													
✓ Zeeshan Khan													
✓ Sahil Mahimkar													
✓ Gautam Manuel													
✓ Shibu Mathew													
✓ Adwait Minde													
✓ Ashay Mundy													
✓ Rohit Nair													
✓ Rendell Padu													
✓ Tanisha Parkhe													
✓ Omkar Patil													
✓ Siddhesh Patil													
✓ Grace Pereira													
✓ Micah Philip													
✓ Andrea Pinto													
✓ Emmanuel Pinto													
✓ Abhay Rajbhar													
✓ Yash Rangucha													
✓ Rainer Rodrigues													
✓ Sadiya Shaikh													
✓ Sharon Shajan													
✓ Sushant Shanbhag													
✓ Shreedhar													
✓ Vishwa Shukla													
✓ Divyanshu Tandon													
✓ Spandan Thakor													
✓ Robin Thomas													
✓ Vinay													

**Daily Attendance Legend:**

The student was present then exited rejoined and rejoined again etc. etc. (the alternating background patterns indicate that the student may have left and rejoined the Meet)

The student missed the entire class

To help your eye follow across the page, the table rows alternate between white and grey backgrounds which leads to two subtly different shades of green for the times when the student was present

**NB** - If you want a printed copy of this report, make sure that the 'More settings' → 'Background graphics' checkbox is checked in the Print dialog.

Generated by the [Google Meet Attendance extension \(v1.0.5\)](#)

**Fr. CRCE**  
e-mail



**Jayen Modi Fr. CRCE** <jayen.modi@fragnel.edu.in>

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## **Guiding & orienting students of S.E. (ECS) towards placements & corporate environment**

2 messages

---

**Jayen Modi Fr. CRCE** <jayen.modi@fragnel.edu.in>  
To: noeljaymon23@gmail.com

23 October 2020 at 10:51

Dear Noel

Heartiest congratulations on landing up a job offer with Quantiphi as a chatbox engineer !

With respect to our telephonic conversation, kindly address the students of second year engineering from electronics & computer science (ECS), guiding & orienting them towards placements & corporate environment. You can describe your own experience, how you prepared for the same, the internships you did - anything which will motivate them & make them look forward towards working in a professional & corporate atmosphere.

As discussed, the Google Meet Link ID will be shared with you for today's session 12:30 pm to 1:30 pm in a short while.

Once again, thanks for your accepting the invitation at such a short notice.

Regards,

Jayen Modi

---

**Noel Jaymon** <noeljaymon23@gmail.com>  
To: "Jayen Modi Fr. CRCE" <jayen.modi@fragnel.edu.in>

23 October 2020 at 11:25

Hello sir,  
Thank you for your mail. I will try to give maximum information and motivation which would help the students excel in their career.

Regards,  
Noel jaymon.

[Quoted text hidden]



# FR.CONCEICAO RODRIGUES COLLEGE OF ENGINEERING

Father Angels Ashram Road, Bandra West, Mumbai, Maharashtra 400050.

## REPORT OF ROTARACT CLUB OF FRCRCE (2020-2021)

Rotaract Club of Fr. Conceicao Rodrigues College of Engineering is one of the prestigious organizations in the institute. The Club is affiliated under the charter to the Rotary District 3141 Zone 1A under the parent Rotary Club of Bombay Bandra. Rotaract Club of Fr. CRCE aims to organise interactive events as a medium to have funds raised for charity.

The Rotaract Club of CRCE has been affiliated with the Rotary Club of Bombay Bandra, which has recognized the efforts that the Rotaract Club of Fr. CRCE has put in order to make a difference to society. This year, Rotaract Club of Fr. Agnel College (Bandra West) is associated with NGO TWEET foundation to work towards transgender rights, Institute of Exceptional Children, Father Agnel Ashram and NGO COMMUNITY OUT REACH PROGRAMME (CORP). This NGO works to educate and to elevate the life of the children living in the slums.

Despite the limitations and extreme hardships caused by the global pandemic, Rotaract Club of Fr. CRCE has still managed to organize many events in odd and even semester like **Life after Engineering, Finding your Identity, Red Wall Project**, Marathon, awareness programs and many more to help and to raise the fund for charity.

The Club has always upheld its ultimate goal of contributing towards the society. For this very purpose, the Club organizes 'The Heart and Sole Run 4.0' to encourage people from all over India to run for social change. This club has donated Rs. 20000 to Father Agnel Ashram and 15000 to CORP NGO.

### List of council members 2020-21

Name	Post	Class
Senior council		
Rtr. KraigFernandes	President	TE ELEX
Rtr. LeandraMonteiro	Vice President	TE IT
Rtr. SaptarshiChatterjee	Secretary	TE ELEX
Rtr. Sakshi Ghadigaonkar	Joint Secretary & Technical Head	TE COMPS
Rtr. Lochan Chitnis	Sergeant at arms officer	TE ELEX
Rtr. Samruddhi Shrawne	Public Relations Head	TE ELEX
Rtr. Antinni Joseph	Marketing Head	TE PROD
Rtr. Vaishnav Malvankar	Treasurer	TE ELEX
Rtr. Nikhil Sharma	HRD Officer & Editorial Head	TE ELEX
Junior Council		
Rtr. Pearl Bharti	Club Service Director	SE COMPS
Rtr. SakshiChavan	Community service director	SE COMPS
Rtr. Jessica D'souza	Professional Development Director	SE COMPS
Rtr. Rohit Nair	Taskforce Director	SE ECS
Rtr. SifraBiju	Public Relations Director	SE COMPS
Rtr. RendelPadu	Marketing Director	SE ECS
Rtr. Gautam Manuel	Digital Communications Director	SE ECS

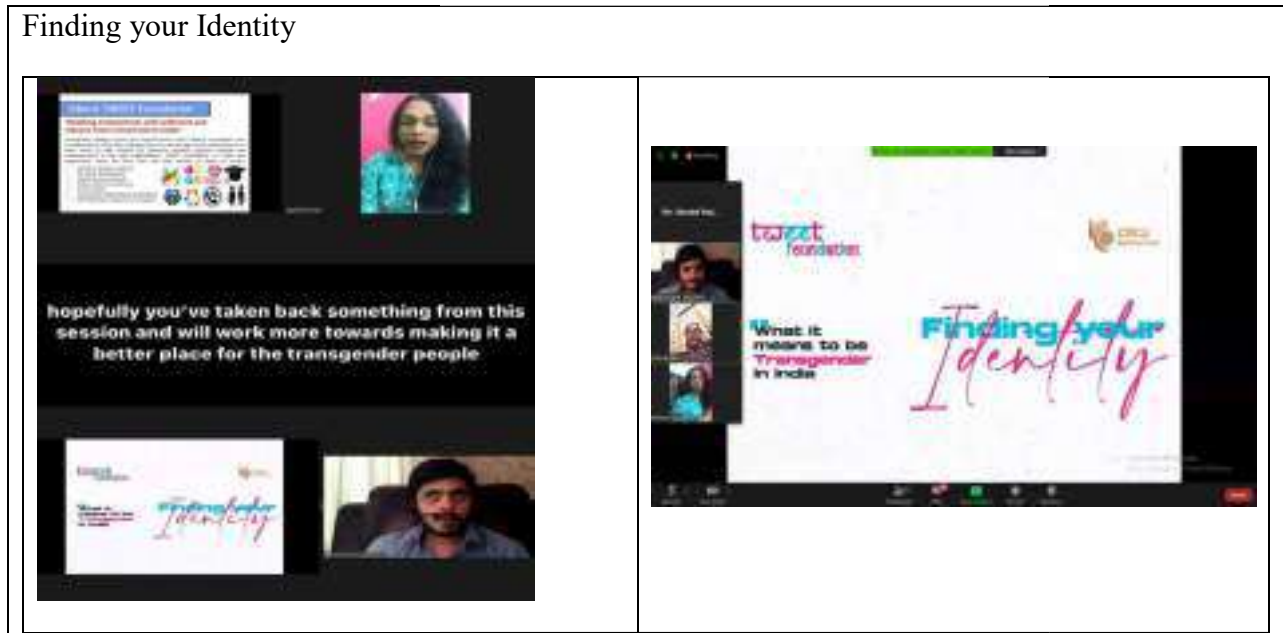
**List of activities conducted 2020-21**

<b>Sr . No</b>	<b>Activity/seminar/session</b>	<b>Short information</b>	<b>Speaker/Judges Details</b>	<b>Date/ Duration</b>	<b>Number of students Participated</b>
1	Life After Engineering	To highlight the importance of work life balance, work culture & relation management and counseling students for professional development in the corporate sector.	Mr.SwapnilKshirsagar founder ofLife Incredible	Date:09-10-2020  Duration:2 hours	102
2	Finding your Identity	To try and create awareness regarding the stigma that the transgender community faces which leads to lack of opportunity and cynical form of exclusion from benefits and acceptance.	AbhinaAher& Shaman Gupta co-chairs of TWEET Foundation	Date: 17-10-2020  Duration:2 hours	58
3	Red Wall Project	In light of the awareness session presented by TWEET Foundation, we took up this social media initiative with respect to the “Red Wall Project”, an activism project initiated by Trans rights activist Kalki Subramaniam to empower the voices of the transgender, non-binary and gender-diverse people of India against sexual abuse and assault.	Sahodari Foundation	Date: 18-10-2020  Duration:24 hours	62
4	WHAT’S YOUR GENRE?	An editorial & professional development monthly initiative to escape the daily routine where you can ;  Read. Listen. Binge. Mix.	RC CRCE	Date:10-10-2020  Duration:2 months	NA

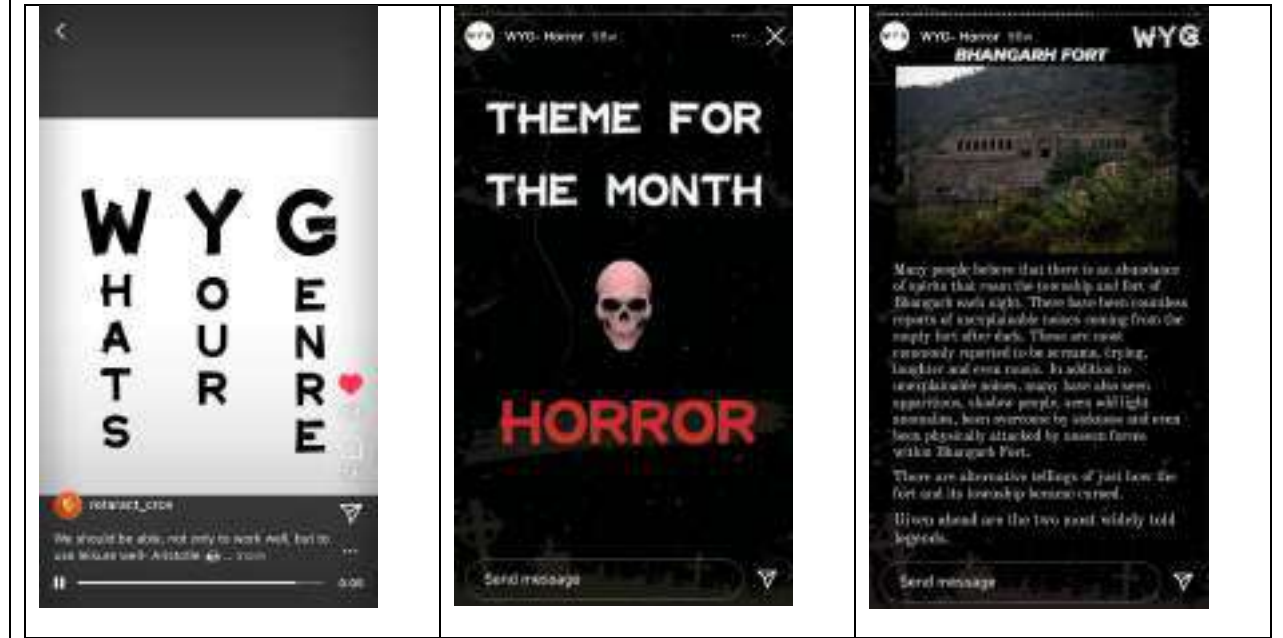
		Mingle. Socialize.			
5	Jaisebhihai, acchehai	It is hard to understand when looking in from outside while it is hard to explain while looking out from inside. A good Mental Health is an asset and all of us should be able to express ourselves. With that notion the Rotaract Club of Fr. CRCE collaborated with IEC mumbai as an attempt to ease the acceptance of the need for a good mental health for everybody.	RC CRCE	Date: 09-11-2020  Duration:24 hours	795
6	Break the Stigma	In light of our social media awareness project about mental health, we decided to delve further into the subject in association with IEC Mumbai, where we bring to you a video series wherein we will be interviewing Professional Experts, who'll help us learn more about mental health and the stigma associated with it.	Mrs. Jasmine Khattar, Clinical and Executive Director of IEC, Mumbai and Dr. TrinjhnaKhattar, Proficiency Head of IEC, Mumbai.  Dr. SmrutiKarambelkar, consultant psychiatrist, IEC.	Date: 25-11-2020  Duration:2 months	1903
7	Heart & Sole Run 4	The "Heart & Sole Run" (HSR) is the annual charity run and flagship event of the RotaractClub of Fr. CRCE. Over the years HSR has been one of the most successfully organised marathon qualifiers in Bandra with around 1000 participants annually. The "Heart &	RC CRCE	Date: 13-03-2021  Duration:48 hours	453

		<p>Sole Run 4" is the fifth edition of this annual charity run and this time it was conducted as a virtual marathon where runners could run from anywhere and anytime during the event days.</p>		
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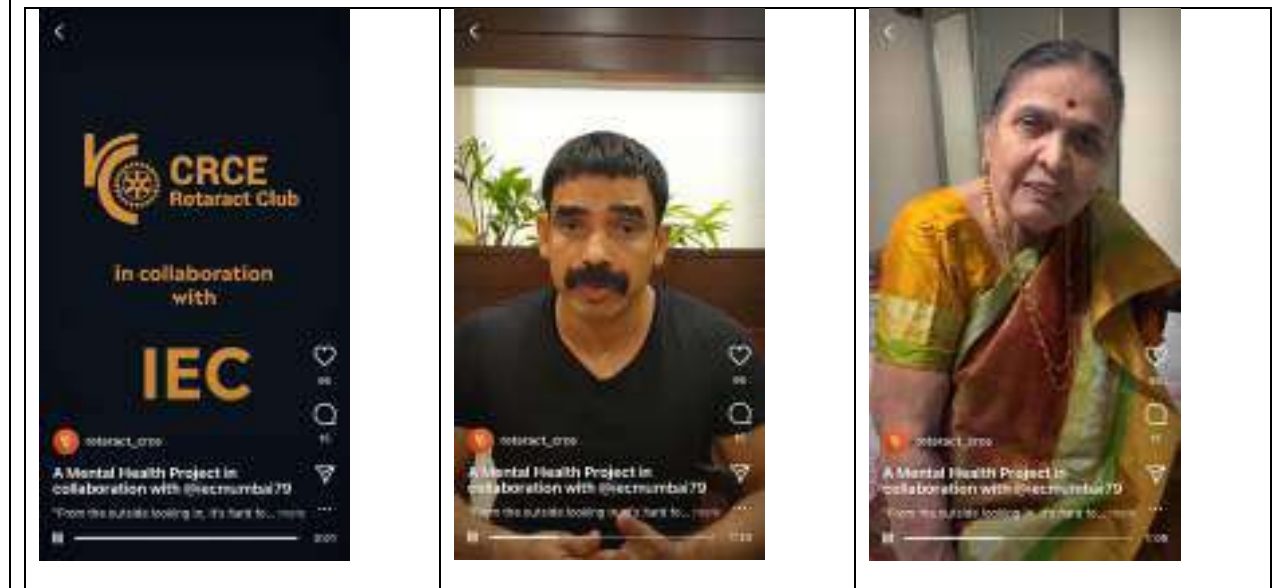
**Photos: event proof with title**



## WHAT'S YOUR GENRE?



## Jaisebhihai, acchehai




## Break the Stigma



## Heart & Sole Run 4



Submitted by

  
Dr. Sujata Deshmukh  
Faculty In-charge

  
Rtr. Kraig Fernandes  
President



**NSSCRCE**



## **REPORT ON PERSONALITY DEVELOPMENT (LEVEL 2)**

**Platform: Google Meet**

**Date: January 22nd, 2020**

**No. of Volunteers attended:65**

An interesting webinar on Integrity was conducted by the NSS CRCE in collaboration with The Movement India. The session aimed to educate young minds on how to be truthful to oneself and to others. After successful completion of level 1 of the Boot Camp initiative, the focus was put on level 2.

The webinar started off with The Movement India team thanking NSS CRCE for conducting such an important and necessary webinar. This was followed by the introduction of the guest speaker, Mr. Preejo TJ by an NSS Volunteer.

Mr. Preejo certainly created an enthusiastic environment to say. He clearly talked about the behavioural pattern of individuals when it comes to Integrity. The entire webinar was revolved around one thing, and that is Truthfulness and Honesty. Because when one is truthful to one's own self, there are no regrets to ponder upon. The random questionnaire round was the most amusing as it involved most of the volunteers. It was an amazing experience to have this break the ice session.

The talk took about an hour and a half and the audience played an amazing role to make it a success. This was followed up by an interactive Q&A session.

Altogether, the session proved to be thoroughly educative, informative and helpful. At the end of the webinar the attendance and feedback of all attendees was recorded.



Image: Guest Speaker Mr. Preejo TJ



NSSCRCE



## REPORT ON PERSONALITY DEVELOPMENT (LEVEL 3)

**Date:** 4<sup>th</sup> March, 2021.

**Mode:** Google Meet

**No. of Volunteers attended:**28

NSS CRCE with The Movement India organized an event on Servant Leadership. Servant Leadership is a topic that not many people are aware about and that is why we kept this topic as the Level 3 of our Personality Development Sessions.

The Speaker for this session was Mr. Preejo, who has over 11 years of Behavioural Training Experience.



Before starting with the main topic, Preejo sir asked the members few questions from the Level 1 & 2. Members seemed to remember most part of the two sessions.

Preejo sir then quickly revised whatever had been done in the Level 1 & 2 and then started off with What exactly is Servant Leadership according to the members?





He then gave an example of Marvel and Captain America and asked the members that who according to them is a better Leader?

He then explained various aspects related to Servant Leadership like the Principles and Roles of Servant Leadership and how can you learn it?

At the end of the session, he asked who according to us is the best leader? Which got a lot of responses and everyone discussed why they feel their role model is a better leader.

Preejo sir wrapped up the session with an Interactive Q & A Session.

### **Gender Equity**

- International Women's day celebration by WIE
- Best Allrounder Award for Male and Female Students
- Women Development Cell
- Event on Women Empowerment Catalyst by NSS
- International Women's day celebration by WIE
- Girl students in various student chapters - Sample Lists of members



**Fr. Conceicao Rodrigues College of Engineering**  
(Affiliated to University of Mumbai, Approved by AICTE, New Delhi)

Fr. Agnel Ashram, Bandstand, Bandra (West), Mumbai – 400050.  
Phone: 022-26423841/42, Fax: 022-26516831  
Website: sites.ieee.org/sb-crce, Email: ieee.crce@gmail.com



## Report of Event on Women's Day Celebration

Date: 12<sup>th</sup> March, 2021

**IIC-FrCRCE, IEEE and WIE** of Fr. Conceicao Rodrigues College of Engineering, Bandra, Mumbai, recently conducted an event on 'Women's Day Celebration' 12<sup>th</sup> March 2021 from 2:30 to 3:30pm. This event is conducted under the guidance of Prof Sushma Nagdeote and Prof Swapnali Makdey and, of FRCRCE and with cooperation of the organizing team. There were more than 100 participants present at the event.

Many students' boys as well as girls from the college actively participated for the event and showed their enthusiasm. Students from various branches attended the event. SE Representative of Anu Thomas WDC-CRCE and Technical Head IEEE Khushboo Golampalle introduced our Local Superior Rev. Fr. Valerian D'Souza. Father gave a wonderful speech on women empowerment. Then after his speech Rev.Fr. Valerian D'Souza proceeded with his speech of the day. Then our Principal ma'am Dr. Srija Unnikrishnan gave a speech on women leading the world. They had live performances as well as recorded performances. After the speech there was the First performance of the day beatboxing performance of Alrich followed by the first dance of the event Ghar more piya by Ms.Gini Chacko.

Our speaker of the day Chairperson of "WEE-Women Entrepreneurs Enclave" and Owner of shreeOM Communication and Solutions gave a motivational speech on Perseverance and determination "Ladder to Success" and shared their experience during their struggle days. Then there was a live singing performance by Raj and a second dance performance Nainowale Ne by Ms. Lidya Simon Raj. Second singing performance by Vivian, third dance performance by Swalla Jathi and the last performance of the day was beatboxing by Colin. It was a collaboration event for WIE CRCE and WDC CRCE. The outcome of the event is to support and encourage women empowerment.

Report by

**Prof Swapnali Makdey**

(Branch Counsellor-IEEE)



**Prof Sushma Nagdeote**

(Branch Counsellor-WIE)



WIE & WDC  
IS HOSTING  
AN EVENT FOR  
**WOMEN'S DAY CELEBRATION**  
Motivational speech  
on  
**PERSEVERANCE AND DETERMINATION:  
"LADDER TO SUCCESS"**  
By  
**CHAITALI CHATTERJEE**  
Chairperson of 'WIE - Women  
Entrepreneurs Endeavor'  
Center of Study/CEI Communications &  
Institute



**WELCOME  
TO  
WOMEN'S DAY  
CELEBRATION**

**MS. CHAITALI CHATTERJEE  
MOTIVATIONAL SPEAKER**





SOCIETY OF ST. FRANCIS XAVIER, PILAR'S

# FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING

(Approved by AICTE & Affiliated to University of Mumbai)

Fr. Agnel Ashram, Bandstand, Bandra (W), Mumbai - 400 050.

Phone : (022) 6711 4000, 6711 4101, 6711 4104 • Fax : 6711 4100

Website : www.frcrce.ac.in • Email : crce@fragnel.edu.in

Ref.: CRCE / 2021 / 104

Date : June 21, 2021.

## NOTICE

### BEST ALL ROUNDER

### Academic Year 2020-2021

We are pleased to announce the names of the winners of the Best All Rounder Award 2020-2021.

**Best All Rounder (Female Category) - Ms. Meera Ghaskadvi**  
**B.E. Information Technology**

**Best All Rounder (Male Category) - Mr. Pranay Bagrecha**  
**B.E. Computer Engineering**

*Congratulations to the winners and to all the participants.*

  
**(DR. SRIJA UNNIKISHNAN)**  
**PRINCIPAL**

CC : Fr. Peter D'Souza  
Fr. Valerian D'Souza  
Dr. D.V. Bhoir



  
**PRINCIPAL**

**FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING**  
Fr. Agnel Ashram, Bandstand, Bandra (W), Mumbai - 400 050.

**Best All-Rounder Award 2020-21**

Sr. No.	Roll No.	Name	Branch	Academics 10	Extra-co-curricular activities 10	Innovative Thinking 10	Social Concern 10	Leadership Qualities 10	Total 50
<b>Female Candidates</b>									
1	8294	Aishwarya Parulekar	Electronics	9	9	7	9	9	43
2	8346	Elita Menezes	Computer	10	9	9	9	9	46
3	8353	Darlene Nazareth	Computer	9	9	9	9	9	45
4	8392	Meera Ghaskadvi	Info. Tech	9	10	9	9	10	47
<b>Male Candidates</b>									
1	8193	Pradnyesh Dound	Production	5	8	9	8	10	40
2	8227	Purav Advait	Production	9	8	8	6	8	39
3	8314	Pranay Bagrecha	Computer	9	10	9	9	9	46
4	8335	Sherwyn D'souza	Computer	9	9	10	8	9	45
5	8340	Kevlyn Kadamala	Computer	9	8	8	8	8	41
6	8042	Mayank Tanna	Info. Tech	7	7	10	9	10	43

Panel Members

Fr. Peter D'Souza

Fr. Valerian D'Souza

Fr. Eleuterio Fernandes

Dr. Srija Unnikrishnan

Dr. Deepak V. Bhoir

Evaluator's Signature:



PRINCIPAL

Date: 18/06/2021



SOCIETY OF ST. FRANCIS XAVIER, PILAR'S

## FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING

(Approved by AICTE & Affiliated to University of Mumbai)

Fr. Agnel Ashram, Bandstand, Bandra (W), Mumbai - 400 050.

Phone : (022) 6711 4000, 67114101, 6711 4104 • Fax : 6711 4100

Website : www.frcoe.ac.in • Email : crce@fragnel.edu.in

Ref.: CRCE / 2019 / 315A

Date : August 1, 2019.

### NOTICE

#### " WOMEN'S DEVELOPMENT CELL "

In an effort to promote the well being of the girl students, Teaching and Non-Teaching Women Staff of the Institute, to deal with the cases / complaints of sexual harassment and to implement the women's policies in general, a **Women's Development Cell** has been re-constituted in the College. This is in compliance with the decision of the Supreme Court of India. The College Women's Development Cell shall consist of the following members :-

S.No.	Name of the Member		Contact Nos.
1	Dr. Srija Unnikrishnan	President	9869005457
2	Dr. Sapna Prabhu	Co-ordinator	9833545743
3	Dr. Jagruti Save	Member	9869621900
4	Dr. Hemant Khanolkar	Member	9869154398
5	Mrs. Sushma Nagdeote	Member	8879626260
6	Mrs. Neelam D'Silva	Member	9823449254
7	Ms. Neha Prakash	NGO Representative	8419996979
8	Ms. Riya Gupta	Students Representative	8369097017

All the concerned are requested to note the contact details of the above members and represent their grievance to any of the member, if any for their consideration and suitable action.

(DR. SRIJA UNNIKRISHNAN)  
PRINCIPAL

- Copy to : - Fr. Peter D'Souza, Fr. Valerian D'Souza  
- HODs - Production Engg, Electronics Engg, Computer, I.T., H&S  
- Members of Women's Development Cell - for information and necessary action  
- Staff / Student's Notice Board





NSSCRCE



## REPORT ON WOMEN EMPOWERMENT

**Date:** 15<sup>th</sup> March, 2021.

**Mode:** Google Meet

**No. of Volunteers attended:**54

We are all aware of how important Women Empowerment is and how even in 2021, women are still being discriminated based on their gender.

To create an awareness about this issue, **NSS CRCE** organized an event on Women Empowerment with **Katalyst**.

Katalyst started a decade ago with the intention of liberating women through the pursuit of professional education.

Their initiative prepares young women for leadership roles and for building self - confidence amongst themselves.

We had three speakers for our event, Gautami Siliveri, Samiksha Ramteke and Anjali Selokar.

The event started with an engaging presentation from Katalyst. Where in, they spoke about what exactly does one mean by 'Women Empowerment' and what can we as an individual do to support it.



Samiksha and Anjali spoke about the topic from the very basics so that everyone is clear with what they are explaining.

After talking about the basics, Gautami took over and spoke about the never – ending barriers which are imposed on women by society and in some situations, even their families.



She spoke how Women are paid less, expected to cook and still being restricted by their family. Not only this, but also how people now – a – days pass sexist comments like, “Stop driving like a woman!” or “If you go to work, who will take care of the house?”.

## *Ways to promote Women Empowerment*

- ❖ **Create opportunities for women of every age.**
- ❖ **Create new roles for women, so companies can develop better.**
- ❖ **Pay should be equal irrespective of gender.**
- ❖ **Empowering women by educating them.**
- ❖ **Diversify leadership by promoting women for management and executive positions.**
- ❖ **Creating safe space.**
- ❖ **Support Independence and Mobility.**
- ❖ **Educating whole system including men.**



Gautami then spoke about what can we do to promote Women Empowerment. If we see any sort of inequality happening around us, we shouldn't keep quiet! We should raise our voice and ask for equality. After this, the session was ended with a Q & A Session.

Name	Post	Phone number	email
<b>Senior Council</b>			
Kevin Ruffin	President	9604003680	kevinruffin1505@gmail.com
Ninad Shetty	General Secretary	8451941231	ninadshetty71@gmail.com
Anu Thomas	Cultural Secretary	7738456280	anu@tmail.in
Saloni Khanna	Editorial Secretary	8796123583	salonikhanna9@gmail.com
Yameen Ajani	Technical Secretary	9167293111	yameenajani@gmail.com
Felin Patel	Girl's Sports Secretary	7045465080	felinpatel7@gmail.com
Andrew Noronha	PR Head	9820709199	andrew7330@hotmail.com
Ayaan Shaikh	Marketing Head	7506141217	17.ayaan@gmail.com
Joshua Godinho	Boy's Sports Secretary	9769496112	joshuagodinho2010@gmail.com
Ashish Bandarkar	Marketing Head	9820394946	ashishbandarkar37@gmail.com
Gautami Thakur	Design Head	9833313047	grthakur18@gmail.com
<b>Junior Council</b>			
Nicole Dias	Documentation In-Charge	8779460422	nicole.dias210@gmail.com
Taran Rajpal	SE Representative	9082343049	taranrajpal11@gmail.com
Sachi Verma	Ladies Representative	7506054956	sachiverma00@gmail.com
Emmanuel Pinto	SE Representative	7028690031	emmanuelpinto969@gmail.com
Tanisha John	Ladies Representative	9324473394	tanishajohn28@gmail.com
Yohan Mhatre	Media In-Charge	9820668844	yohanmhatre2001@gmail.com
Nixon Lobo	SE Representative	8007282680/ 8369288130	lobonixon123@gmail.com
Lance	Webmaster	6355582633	soareslance10@gmail.com

Alisha Rao	Ladies Representative	9892093890	alisharao0749@gmail.com
UPMANYU JHA	Asst. Design Icharge	7303969321	masterupmanyu001@gmail.com

## **Rotaract Club of Fr. CRCE** **2020-2021**

Post	Name	Branch	Contact No.
Immediate Past President	Rtr. Nachiket Nisal	BE IT	+91 75881 97526
<b>CORE TEAM</b>			
President	Rtr. Kraig Fernandes	TE ELEX	+91 99307 41174
Vice President	Rtr. Leandra Monteiro	TE IT	+91 96733 78844
Secretary	Rtr. Saptarshi Chatterjee	TE ELEX	+91 80172 07392
Joint Secretary	Rtr. Sakshi Ghadigaonkar	TE COMPS	+91 96377 62627
Sergeant at Arms Officer	Rtr. Lochan Chitnis	TE ELEX	+91 82910 53872
Marketing Head			
Public Relations Head	Rtr. Samruddhi Shrawne	TE ELEX	+91 97691 65837
Treasurer	Rtr. Vaishnav Malvankar	TE ELEX	+91 97698 39583
HRD and Editorial Head	Rtr. Nikhil Sharma	TE ELEX	+91 87796 67812
<b>BOARD OF DIRECTORS</b>			
Club Service Director	Rtr. Pearl Bharti	SE COMPS B	+91 86918 41756
Community Service Director	Rtr. Sakshi Chavan	SE COMPS B	+91 80826 01139
Public Relations Director	Rtr. Sifra Biju	SE COMPS A	+91 95189 13911
Marketing Director	Rtr. Rendell Padu	SE ECS	+91 98928 00672
Professional Development Director	Rtr. Jesica D'souza	SE COMPS B	+91 83799 62174
Task Force Director	Rtr. Rohit Nair	SE ECS	+91 81043 65127
Digital Communications Director	Rtr. Gautam Manuel	SE ECS	+91 87796 35571



Dr. Sujata Deshmukh  
(Teacher in-charge)

Dr. Deepak Bhoir  
(Dean of Student Affairs)

## TEDxCRCE

TEDxCRCE allows our stage to host personalities who have sheer passion to have an impact on our society be it political, social, technological or cultural. The speakers share their belief in their ideas which allow them to move the masses, the extent of their success and the evolution / termination of their ideas in due course due to the constant changes taking place worldwide. In addition to this, this chapter organizes technical activities like Internship expo and resumes building session. Further the council is also involved in various events related to social work through Community Services like Volunteering drive, Food Rescue Operation.

### **List of TEDxCRCE council members 2020-21**

<b>Name of student</b>	<b>Post</b>	<b>Class</b>
Renjit Koshy	Organizer	BE ELECTRONICS
Pragati Rao	Curator	BE ELECTRONICS
Meera Ghaskadvi	Director	BE IT
Gladden Rumao	Co-organizer	TE COMPUTERS
Prisha Sharma	General Administration Head	TE ELECTRONICS
Sylvester Rodrigues	Marketing and Sponsorship Head	TE ELECTRONICS
Clafacio Lobo	Internship Expo Head	TE IT
Kartik Salian	PR and Media Head	TE ELECTRONICS
Warren Fernandes	Jr. Technical Head	SE COMPS B
Amrutha Sureshkumar	Jr. PR Head	SE COMPS B
Mufaddal Rangwala	Jr. PR Head	SE ECS
Candida Noronha	Jr. Design Head	SE COMPS B
Jyothis Shajan	Jr. Design Head	SE ECS
Insiya Shamshi	Jr. Marketing Head	SE COMPS B
Lizel Fernandes	Jr. Documentation Head	SE COMPS B

### **Human Values**

- FE Induction program
- Yoga Webinar by Khush Panchal by NSS
- Online Defense Workshop by NSS
- Global Freedom Summit by NSS
- Awareness on Anti Human Trafficking by NSS
- Mental Health and Welfare Webinar by NSS
- Road Safety Awareness and Welfare Webinar by NSS
- Webinar on Right to Information by NSS
- Drive on Feeding Stray Animals by NSS
- Session on Child Labor by NSS
- TEDxCRCE Talks Shifting Gears
- Heart & Sole Run 4 by Rotract
- Finding your Identity by Rotract
- Red Wall Project in association with Sahodari Foundation by Rotract
- Jaise bhi hai acche hai' mental health awareness by Rotract
- Break the Stigma interview series on mental health by Rotract

## CRCE

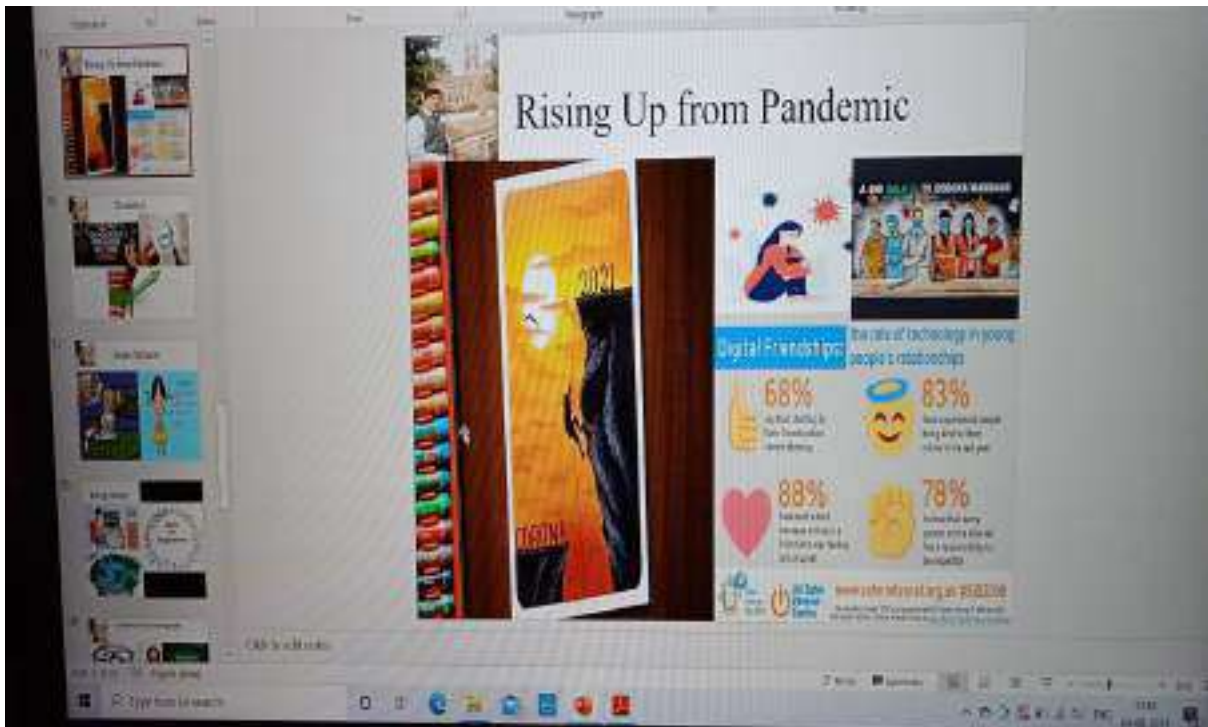
### Fr. Conceicao Rodrigues College Of Engineering

A Report on Induction Program for 1<sup>st</sup> year students for the Academic Year ( 2020-2021)

An Induction Program was organized once in a week for two/ three hours for first year Engineering students of our college. The objective of this program was to familiarize students to the new environment and get them acquainted with the institution culture. This Year due to pandemic the sessions were held in online mode comprised of interesting lectures on different areas like social, cultural , Innovative and creative ideas etc. The Aim of Induction is to ensure smooth transition of the students into the current system .


#### SCHEDULE OF THE INDUCTION PROGRAM

SR.NO	DATE	SESSION/ TOPIC	TIME	MODE/ Speaker
1	16/2/21	Orientation for FE Students	10am- 11am	Zoom ( Mr. Paresh Shetty)
2	24/2/21	“ Opportunities in Cocurricular, extra-curricular and Cultural activities	2.30- 4.30	Zoom ( DR. Dipak Bhoir)
3	3/3/21	Introduction to the respective Departments by HODs	2.30- 4.30	Google meet ( HODS of the Department)
4	5/3/21	Introduction to Non-Technical teams (clubs) of our college	2.30- 4.30	Zoom (DR. Sujata Deshmukh )
5	17/3/21	“ Path towards right direction”	2.30- 4.30	Zoom ( Dr. Joseph Rodrigues)
6	26/3/21	“ Journey-Innovative projects to product”	2.30- 4.30	Zoom ( Prof. Swati Ringe)
7	10/5/21	Introduction to Technical teams of our college	2.30- 4.30	Zoom ( Teacher In charges of the technical teams)
8	2/6/21	“ Internships-Enriching knowledge and skills while undertaking the professional courses”	2.30- 4.30	Zoom (DR. Ketaki Joshi)
9	16/6/21	Interaction with Alumni Association and opportunities ahead	4-5	Zoom ( Mrs. Prachi Patil)
10	19/6/21	Workshop on “ Basics of Robotics”	9.30 – 11.30	Zoom (Robocon Team)
11	29/7/21 – 2/8/21	Mentoring Session		Google meet (Respective class Teachers)





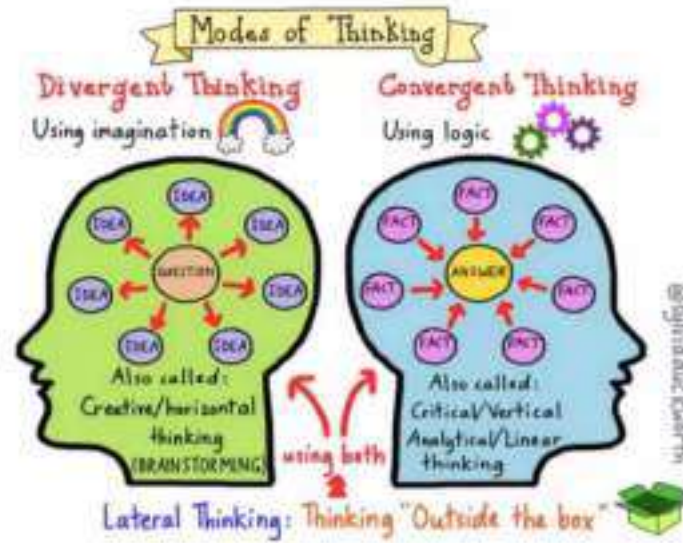
Path Towards the right direction.....



Dr. Joseph Rodriguez

The image shows a presentation slide with a white background. At the top, the text "Path Towards the right direction....." is written in a black, cursive font. Below this text is a photograph of a black signpost with four white directional signs pointing in different directions. The signs are labeled "HELP", "SUPPORT", "ADVICE", and "ASSISTANCE". The background of the photograph is a bright blue sky with scattered white clouds. Below the photograph, the name "Dr. Joseph Rodriguez" is written in a black, cursive font. The slide is displayed on a screen, with a sidebar on the left showing several small thumbnail images and a top menu bar with various icons and text.

# INNOVATIVE MINDSET



Agri CRCE

Amr Deora

Uh, summa-lumna, do...

## WHAT IS INNOVATION.

Innovation is a journey, a voyage towards value creation.



Who is making it a journey - Agents of Innovation

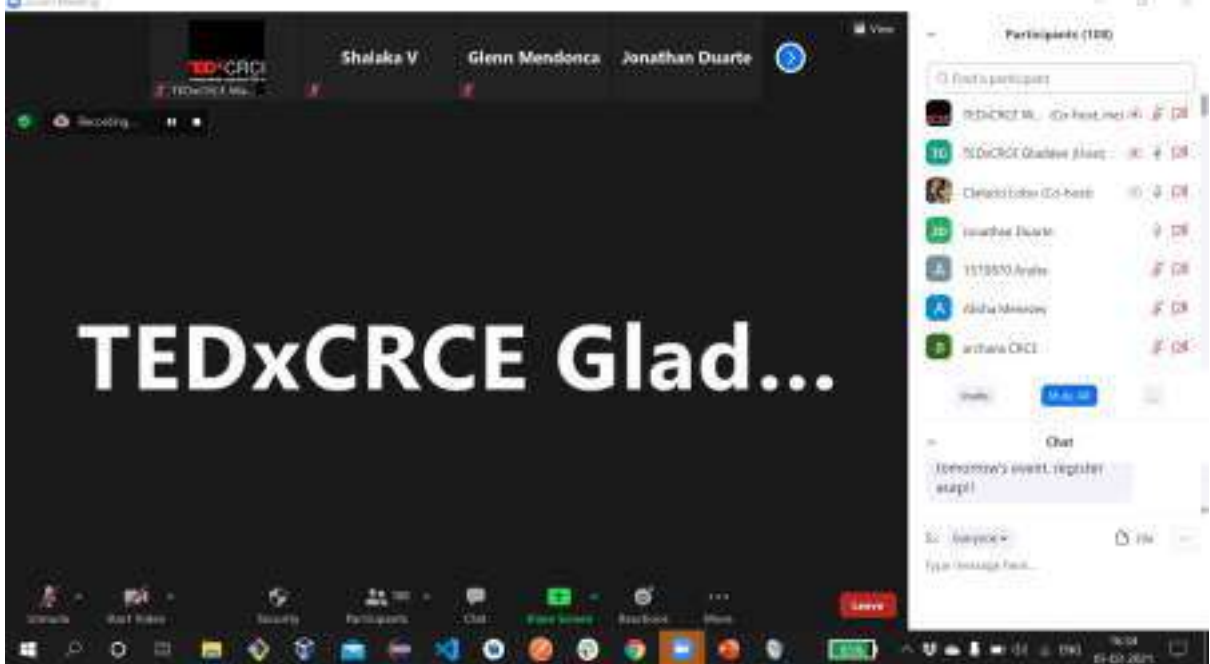
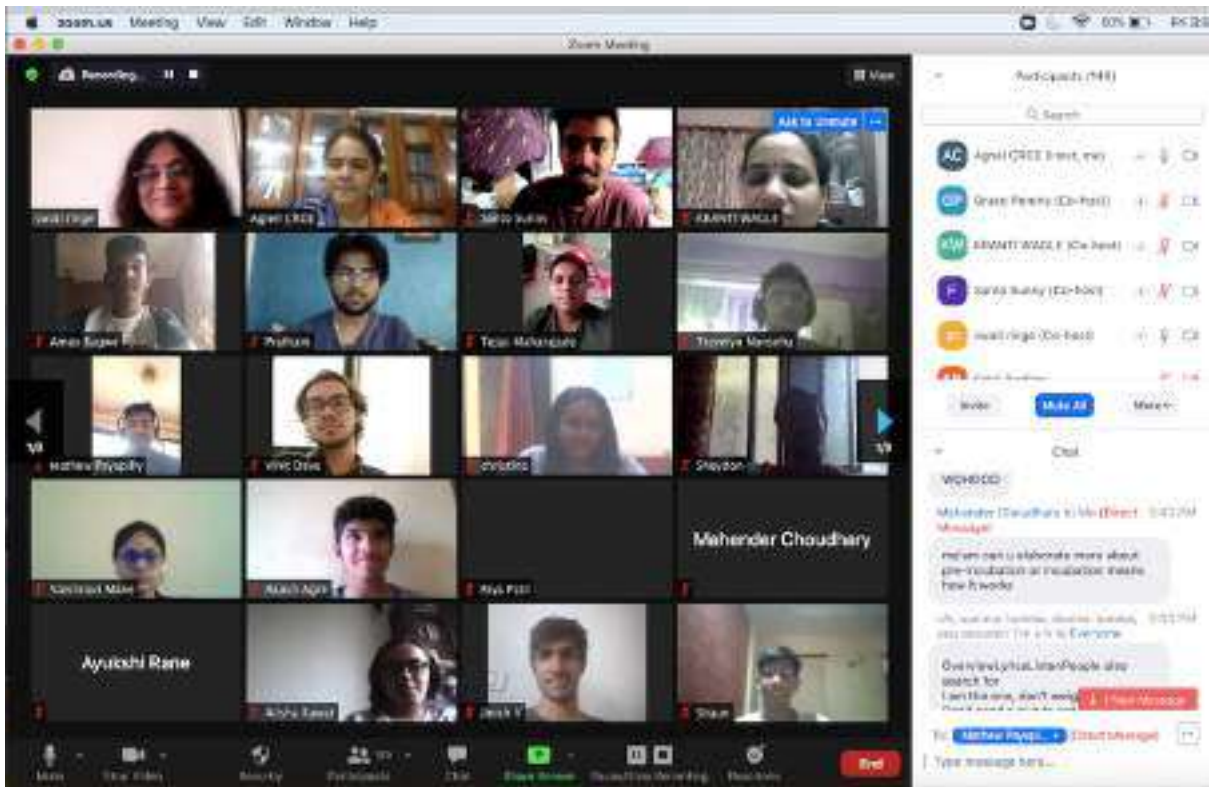
- Managers of Growing Organizations
- Social Innovators
- Entrepreneurs: Innovation is what they do, they do it in many different contexts
- ...Startup
- ChangeMaker - Anyone and everyone who makes the change happen
- We are all potential entrepreneurs - we are all able to make innovation happen

Turn ideas into a solution that adds value from customer's perspective.

Amr Deora





Agri CRCE

F





# Project Cell

 Varbhav Gubbale	Agnel CRCE	Prof. Deepak V...	Rachel Sequeira	 Rishi Tiplaji
Shreyash Singh	VSJ	Reuben D'sa	 Arvind Khandekar	 Dr. Vaidh A. Shetty
Hemant Khanol...	 16 Pradyesh Do...	allsha	 TEAM CEO - Pr...	 Ajay Raj
Andrea Pinto	 E13, SahiWahare...	KRANTI WAGLE	Shree Lofe	yrm



**CRCE**

## What is Team Robocon?

*Fr. Conceicao Rodrigues Collage Of Engineering has been ranked amongst the top 5 engineering colleges affilated with Mumbai university. The collage is know for its excellence in academics and co curricular activities.*

*As a part of the latter, Team Robocon CRCE was founded by a group of budding engineers with a passion for Robotics.*

*We represent our collage in ABU's Competition. Hence we rightly live up to vision*

**Most Imp Engineers who can bulid the nation**



# Types of Internships

Paid Internships	<ul style="list-style-type: none"> <li>Primarily offered in the private sector or by large organizations paying stipends</li> <li>While training the interns, scrutinize them to evaluate their potential as future employees</li> </ul>	Agneel CRCE
Internships for Credit	<ul style="list-style-type: none"> <li>Experience strongly related to academics qualifying the criteria set</li> <li>Value of internship experience to be considered for academic credits</li> </ul>	Surel Chaudhari CRCE
Non-Profit Internships	<ul style="list-style-type: none"> <li>The purpose of the organizations is providing service to the society such as trusts, hospitals, government agencies</li> <li>Help in developing social responsibility and ethics</li> </ul>	Prachi Cheooliar Patil
Summer Internships	<ul style="list-style-type: none"> <li>Eight to Twelve weeks part time / fulltime during summer breaks</li> <li>Short-term experience providing real insights in a field</li> </ul>	Hamant Khanolkar
Service Learning	<ul style="list-style-type: none"> <li>Community work or service offered in a field</li> <li>Articulates values, skills and knowledge required in a specific field</li> </ul>	
Co-operative Education	<ul style="list-style-type: none"> <li>One or more years of working on co-ops while learning</li> <li>Provide opportunity to network with industry professionals</li> </ul>	
Externships	<ul style="list-style-type: none"> <li>Much shorter durations of few days</li> <li>Offers bird's eye view of a career field and future networking</li> </ul>	

Source: <https://www.thefishfinders.com/>

## Alumni Association Of Fr. CRCE



**SLAVYA GOLINI**  
BE COMPUTERS  
MS, Big Data, Data Science  
Sichuan Heavy University  
Data Scientist, Huawei Logistics Inc.



**ACHAL SHAH**  
BE PRODUCTION IE  
MBA, Northwestern University  
Management Consultant, Deloitte



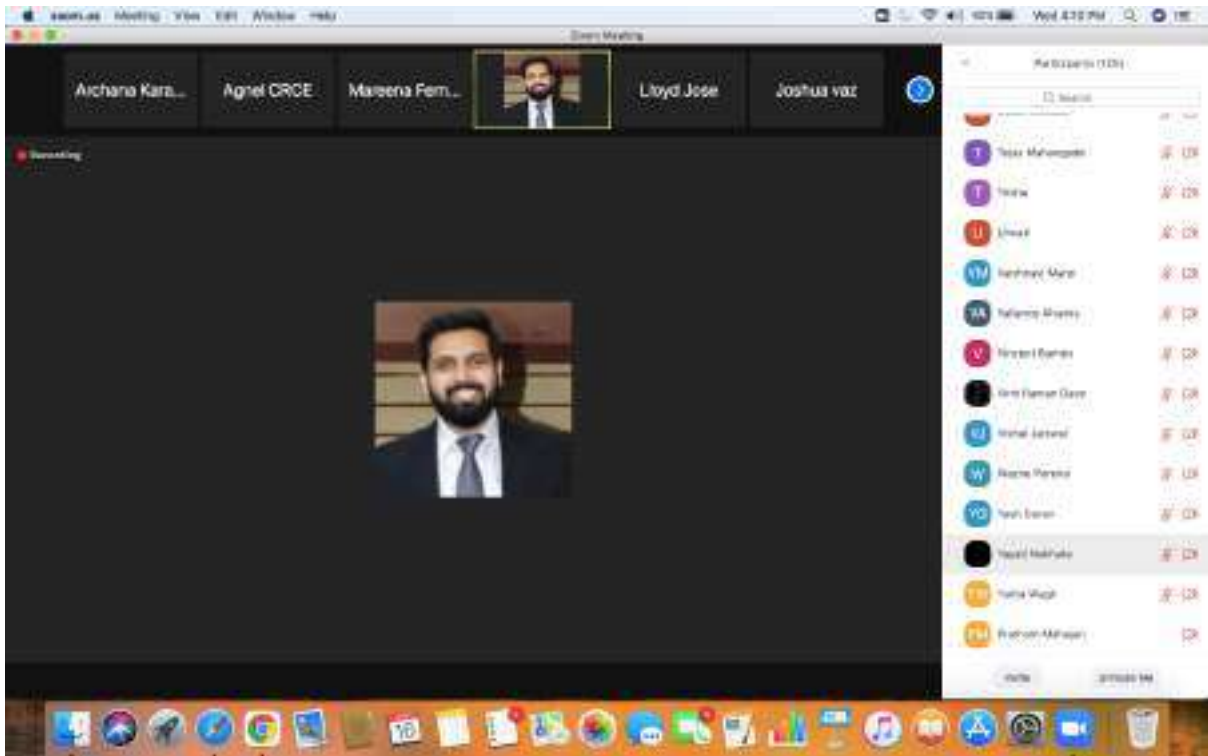
**MARIYA ALI**  
BE ELECTRONICS '19  
MS, Electrical and Computer  
Engineering, Purdue University  
Product Manager, IBM Security



**JANHAVI POOJARI**  
BS '17 - IE  
MS, Business Administration  
University of Illinois  
Chicago

Panel Discussion Topic : How to equip yourself for further studies

Alumni Guiding students for Education Opportunities Abroad





**Connect Today**  
**Transform Tomorrow**  
 It is not just our **Mission**,  
 It our **wish** for YOU

Archana Karandkar

Agnel CRCE



RR

Joshua vaz

17





NSSCRCE



## REPORT ON YOGA WEBINAR BY KHUSH PANCHAL

**Place: Online Webinar (Google meet)**

**Date: 10th September, 2020.**

**No. of Volunteers attended: 66**

We are all aware of the tremendous advantages that Yoga brings in our day to day life. From Increased Flexibility and Weight Reduction to Improved Respiratory System and Heart Health, Yoga comes with a Full Package.

Keeping this in mind, NSS CRCE organized a Webinar on Yoga with Dr. Kush Panchal. Dr. Kush Panchal is a Yoga and Fitness Trainer and has been the Personal Trainer of Celebrities like Kangana Ranaut, Emma Watson and Shahid Kapoor.

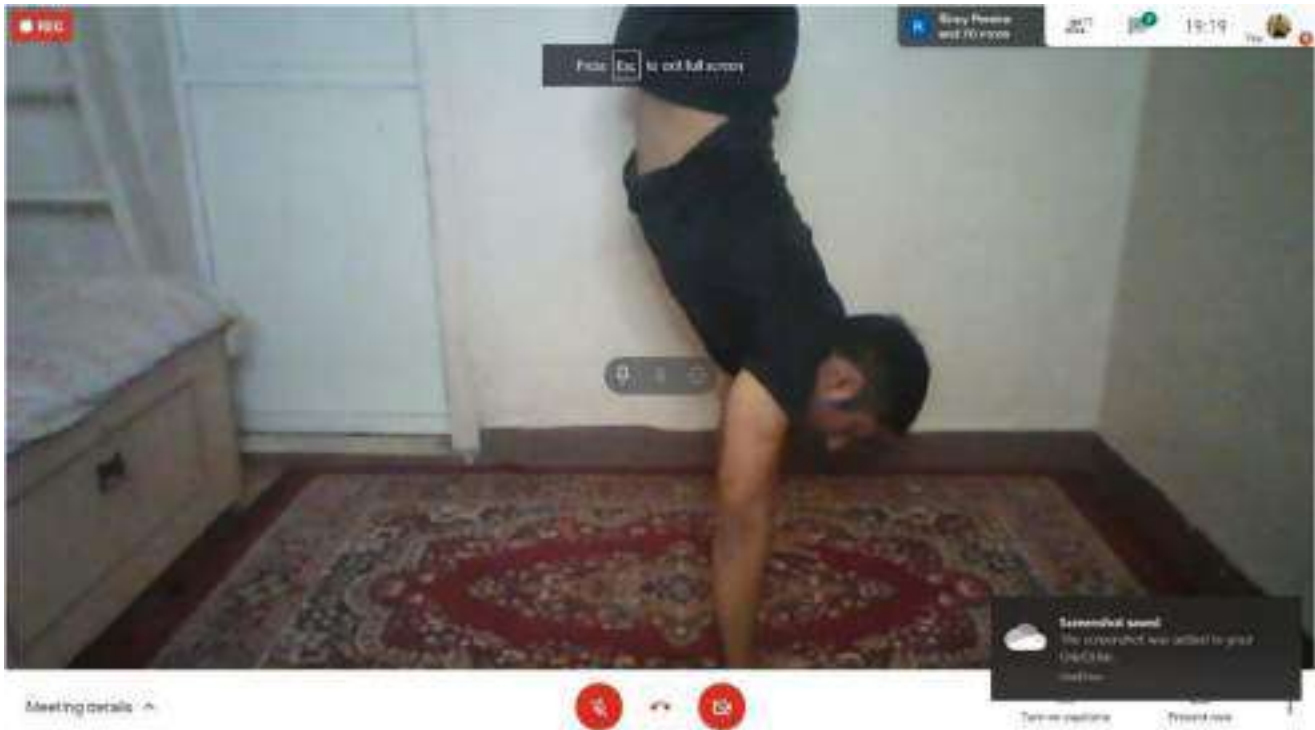
In the Webinar, Dr. Kush started off by doing few Stretches. After few minutes of Stretching, He went on with Meditation and guided all the students during it. He also spoke about the various advantages of doing Meditation daily, like Increase in Concentration and less Stress and Anxiety.

To make the session more engaging and fun, He also did Bhangra along with few students.



Dr. Kush shared his Inspirational and Motivating Story with all of us, about how he decided not to pursue Engineering and do something what he is really passionate about, which is nothing but Yoga!

After that, he exercised along with the students. He did various Pranayams, Asanas and Yoga for Back Pain and Better Posture.



The event ended with a very active Q & A Session with various questions related to weight loss, working out and a proper diet.



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## **REPORT ON SELF DEFENCE WORKSHOP**

**Platform: Google Meet**

**Date: October 7th, 2020**

**No. of Volunteers attended:59**

An interesting webinar on self defence to educate young minds especially for girls was organised by NSS CRCE on October 7th. It was the first time that a practical event like this had to be conducted online due to the prevailing circumstances. Hosting a neat, well planned session was a challenge and the ultimate hard-work of our council members paid off. The volunteers too, were a disciplined audience and had a healthy role in making this webinar a success.

The session began with a brief introduction of the speaker Sensei Kashyap Bhanushalji, voiced by event coordinator NSS Dilton D'souza. Sensei Kashyap started off with an amazing practical demonstration of various moves that can be employed to defend oneself in time of need. With the help of his younger brother, Sensei Kashyap showed how attackers approach the victims and also showed how we can defend ourselves even if the physical strength is way less than that of the attacker's. It was indeed an educative webinar. The webinar ended with a Q&A session, and the attendance of the volunteers was recorded.

The key take-away from the session was how we, as individuals, should be aware of the situations which possess a threat in order to defend themselves.



Image: Demonstration on Self Defence



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## **REPORT ON GLOBAL FREEDOM SUMMIT**

**Platform: Google Meet**

**Date: October 17th, 2020**

**No. of Volunteers attended:63**

On October 17th 4:30 pm IST, members of NSS CRCE in association with The Movement India, had gathered virtually to witness the broadcast of the GLOBAL FREEDOM SUMMIT (A21 org). An event designed to address a very crucial and critical issue in our society, that is, Human Trafficking.

The webinar was very intense and included first hand witness documentations. Every 30 seconds, a person is either trafficked for organ harvesting, labour or prostitution. Each and every aspect of this giant organisation was clearly and explicitly brought forward to the viewers. It was clearly shown how the traffickers approached people with financial problems, poor economics etc. These targeted people were lured with false hope of having a better life, a better education, a good job. The webinar achieved its primary goal, that is, to equip young powerful minds on how to tackle this mammoth syndicate and how to help a person trapped in such situations. Altogether, the webinar proved to be thoroughly educative and informative.

At the end of the webinar the attendance and feedback of all attendees was recorded.



Image: Vision to Abolish Slavery Everywhere Forever.



**NSSCRCE**



## **REPORT ON AWARENESS ON ANTI HUMAN TRAFFICKING**

**Platform: Google Meet**

**Date: October 23rd, 2020**

**No. of Volunteers attended: 49**

After attending the GLOBAL FREEDOM SUMMIT on October 23rd, it became evident that this illegal flesh trade should be put to a forever halt. But how do you do that? Well to answer such queries and to educate the minds on their roles and responsibilities to fight this mammoth syndicate, an awareness session was organised by NSS CRCE in association with THE MOVEMENT INDIA. The webinar began with the guest speaker, Ms. Aneesha Reuben thanking the NSS CRCE team for coordinating and organising the session. Next, the NSS CRCE team extended a very warm welcome to all the members of The Movement India organisation. This was followed by the introduction of the guest speaker voiced by the event coordinator Mr. Dilton D'souza.

The main part of the session started off with a short clip of a very young boy who was a victim of Human Trafficking. The clip also featured an 8yr old girl victim of flesh trade. Listening to their tragedy, all attendees were terribly shocked. The children were forced to do labour work, were not fed enough food and were beaten/abused if demanded for more food or proper clothes. It was clearly shown how the traffickers approached parents with financial problems, poor economics etc. These targeted people were lured with money and false hope of giving their children a better life, a better education, a good job. The guest speaker was very informative and also shared various helpline numbers and government websites that can be used to report these crimes or such suspicious activities. This was followed up by an interactive Q&A session. Altogether, the session proved to be thoroughly educative, informative and helpful. At the end of the webinar the attendance and feedback of all attendees was recorded.



Image: Guest Speaker Ms. Aneesha Reuben



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## **REPORTONMENTAL HEALTH AND WELFARE WEBINAR**

**Date: 28<sup>th</sup> October, 2020.**

**Place: Online Webinar**

**No. of Volunteers attended:63**

Did you know that India is home to the most depressed? That India loses a student every hour? In order to make more and more people aware about this situation, we at **NSS CRCE** organized an interactive session on Mental Health with *The Movement India*.

*The Movement India* aims at solving pressing issues like Human Trafficking, Mental Wellbeing and Education. The Speaker for the session was Mr. Preejo. He has over 11 years of behavioural training experience. Mr. Preejo currently serves as the Leading Consultant with The Movement India, leading their behavioural learning solutions.



Preejo Sir started off by presenting few pictures and asking everyone questions like what do you feel the picture is trying to say, how do you react in difficult situations, and more.

He explained us how important it is to love yourself first. We should be calm and positive when taking decisions or having an argument/discussion with someone. We should pursue small hobbies like Drawing, Painting, Dancing, etc.

Sir also presented a video on Black dog, where it was shown that a boy who did not try reaching out to people and did not address his problems to his family or friends, was trapped completely by the black dog (depression).

Hence, anyone having any kind of problem should make sure that you connect with people. Practice meditation and journaling, it would help reduce stress and anxiety. Have a healthy diet and workout frequently. If you feel scared or not so comfortable with talking to someone you know, then you can reach out to a therapist or you can contact **1800-120-820050**.

The session was ended with a very active Q&A session from our members with questions like How do you know if you are in depression, how can we reach out to people in depression, etc.





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## **REPORT ON ROAD SAFETY AWARENESS AND WELFARE WEBINAR**

**Platform: Google Meet**

**Date: December 22 & 23, 2020**

**No. of Volunteers attended: 27**

On December 22 & 23, 11:00am IST, members of NSS CRCE in association with United Way Mumbai, organized a Road Safety and Guidelines workshop for all NSS Volunteers. This event was introduced to make people aware about the various rules and regulations as there was a tremendous increase in road hazard cases annually.

The session began with a brief introduction of the speaker Mr. Rohit Dalvi by NSS event coordinator Joshua Rodrigues. Rohit first began with his mission to make Indian roads safe and then started the session with some general quizzes on Google form to which all volunteers actively answered. Various topics namely the different road signs and what they meant, importance of keeping a safe distance between vehicles, the different braking systems in vehicles and most importantly picking up the perfect helmet and uses of helmets were discussed.

The whole session was interactive with real life videos demonstrating the pros and cons of the techniques discussed and asking interesting questions throughout. Which brought us to the end of the session where the same form with the same questions was again circulated through the meet to which majority of the participants answered correctly which showed they had learnt a lot from the session. The form entries were recorded and accordingly the attendance. This session was truly helpful for all of us to make us vigilante citizens on roads both while driving or walking.

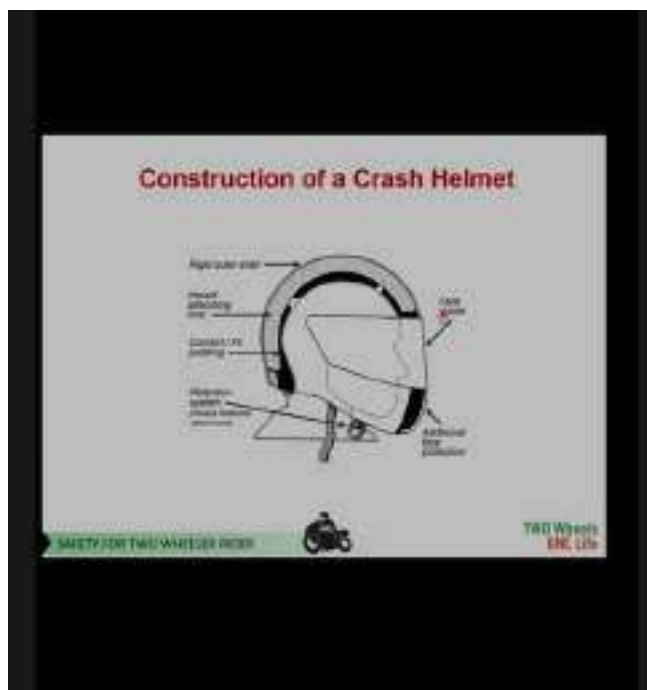


Image: Demonstration of helmet construction.





## NSSCRCE



### REPORT ON RIGHT TO INFORMATION.

**Platform: Zoom**

**Date: February 6th, 2021**

**No. of Volunteers attended:58**

An educative webinar was conducted by the NSS CRCE in collaboration with the PCGT Organisation. The session aimed to educate minds on how the government documents and public data can be accessed by any citizen of our country. The webinar started off with a quick introduction of the speaker, Mr. Shailesh Gandhi by the event handler.

Mr. Shailesh certainly created an enthusiastic educative environment to say. He explained how the citizen of our country can access any documents or files by following a certain legal procedure. He also stated the relevance and need of the RTI act. He certainly laid a base foundation in the minds of all the attendees to understand more about various such privileges and use them upto their full extent. The talk took about an hour and a half and the audience played an amazing role to make it a success. This was followed up by an interactive Q&A session.

Altogether, the session proved to be thoroughly educative, informative and helpful. At the end of the webinar the attendance and feedback of all attendees was recorded.



Image: Speaker Mr. Shailesh Gandhi



NSSCRCE



## REPORT ON FEEDING STRAY ANIMALS

Date: 2<sup>nd</sup> March, 2021.

No. of Volunteers attended:23

"He who feeds an hungry animal, feeds his own soul" - Charles Chaplin

On March 2<sup>nd</sup>, members of NSS CRCE in association with a start-up organisation Paw-tectors formed by CRCE alumni's, has conducted a feeding drive for stray animals. Volunteers had Feed Stray animals in their area and Captured the moment, put it on their Instagram story and tagged @nss.crce and @paw\_tectors.

In this feeding drive for stray animals, top 3 lucky winners had got 2 reflective collars each for their community dogs. The giveaway was after the feeding drive. And the participants who have been a part of feeding drive and followed the instructions will only be eligible for the giveaway.





**NSSCRCE**



## **REPORT ON SESSSION ON CHILD LABOUR**

**Platform: Google Meet**

**Date: March 17th, 2021**

**No. of Volunteers attended:63**

An educative webinar on child labour in our country was conducted by the NSS CRCE. The session aimed to educate young minds on how cruel tge world is to children born in the rural and poor regions of our country.

The session was focused, serios and graspy. It consisted of all the difficulties faced by the children engaged in manual labour. It also showed the status and situation of the parents which forced them to put the lives of their children in harms way. The two major sectors of child labour, bt cotton harvesting and the mining of mica were focused upon in this webinar. The parents being desperatly in need of money are duped and taken advantage of to lend their children for such illegal activities. The session proved to be educative and shed light on an alarming crime against innocent young lives.

Altogether, the session proved to be thoroughly educative, informative and helpful. At the end of the webinar the attendance and feedback of all attendees was recorded.



### **Environment and Sustainability**

- Courses offered in Curriculum
- Personal Sustainability Webinar by NSS
- Carbon Footprint Webinar by NSS
- Coastal Cleanup Day Webinars by NSS
- Recycle Fest NSS
- Climate Change Webinar by NSS
- Documentary on Sustainability by NSS

**T.E. (Production) Sem. V**

Course Code	Course Name	Teaching Scheme (Contact Hours)		Credits Assigned					
		Theory	Pract	Theory	Pract	Total			
PEC501	Design of Mold & Metal Forming Tools	04	--	04	--	04			
PEC502	Operations Research	03	--	03	--	03			
PEC503	Machine Design-I	04	--	04	--	04			
PEC504	CAD/CAM/CIM	04	--	04	--	04			
PEC505	Metrology & Quality Engineering	04	--	04	--	04			
PEDLO 501X	Department Level Optional Course I	03	--	03	--	03			
PEL501	Design of Mold & Metal Forming Tools Laboratory	--	02	--	01	01			
PEL502	Machine Design-I Laboratory	--	02	--	01	01			
PEL503	CAD/CAM/CIM Laboratory	--	02	--	01	01			
PEL504	Metrology & Quality Engg Laboratory	--	02	--	01	01			
PEL505	Business Communication & Ethics	--	02'+02	--	02	02			
	<b>Total</b>	<b>22</b>	<b>12</b>	<b>22</b>	<b>06</b>	<b>28</b>			
Course Code	Course Name	Examination Scheme							
		Theory					Term Work	Pract./Oral	Total
		Internal Assessment			End Sem Exam	Exam. Duration (in Hrs)			
		Test1	Test 2	Avg.	Exam	(in Hrs)			
PEC501	Design of Molds & Metal Forming Tools	20	20	20	80	03	--	--	100
PEC502	Operations Research	20	20	20	80	03	--	--	100
PEC503	Machine Design-I	20	20	20	80	03	--	--	100
PEC504	CAD/CAM/CIM	20	20	20	80	03	--	--	100
PEC505	Metrology & Quality Engg.	20	20	20	80	03	--	--	100
PEDLO 501X	Department Level Optional Course I	20	20	20	80	03	--	--	100
PEL501	Design of Mold & Metal Forming Tools Laboratory	--	--	--	--	--	25	25	50
PEL502	Machine Design-I Laboratory	--	--	--	--	--	25	25	50
PEL503	CAD/CAM/CIM Laboratory	--	--	--	--	--	25	25	50
PEL504	Metrology & Quality Engg Laboratory.	--	--	--	--	--	25	25	50
PEL505	Business Communication & Ethics Laboratory						50	--	50
	<b>Total</b>			<b>120</b>	<b>480</b>		<b>150</b>	<b>100</b>	<b>850</b>

\* Theory for entire class to be conducted.

<b>Course Code</b>	<b>Department Level Optional Course I</b>
PEDLO5011	Internal Combustion Engines
PEDLO5012	Finite Element Analysis
PEDLO5013	Plastic Engineering
PEDLO5014	Micro and Nano Manufacturing
PEDLO5015	Sustainable Manufacturing

Course Code	Course Name	Credits
<b>PEDLO5015</b>	<b>Sustainable Manufacturing</b>	<b>03</b>

#### Objectives

1. To introduce basic concepts related to sustainability and sustainable development.
2. To get conversant with indigenous and global concerns about sustainability and its implications in manufacturing.
3. To familiarize with various technological innovations, approaches & environmental standards /legislations to promote sustainable development.

#### Outcomes: Learner will be able to...

1. Illustrate the agenda of indigenous and global sustainability to fulfil green expectations.
2. Demonstrate the knowledge about management of waste, pollution & energy conservation.
3. Demonstrate the knowledge of sustainability issues with its implementation in manufacturing.
4. Illustrate the relevance and implications of environment friendly materials.
5. Illustrate the implications of environment management in the context of modern industrial practices.
6. Develop the sustainability approach in environmental strategy and manufacturing.

Module	Contents	Hrs.
<b>01</b>	<b>Sustainability:</b> Basic concepts related to sustainability and sustainable development. Issues and challenges facing sustainable development. Global & indigenous sustainability agenda, green expectations & green movement.	<b>04</b>
<b>02</b>	<b>Management of waste &amp; pollution:</b> Types, sources and nature of wastes, waste processing, green processing & engineering operations, Energy recovery, and 3 R principle. Types of pollution and management:-Anti pollution approaches & guide lines.	<b>08</b>
<b>03</b>	<b>Management of Energy:</b> Sources of energy, renewable energy, Innovations in generation, conservation, recycling and usage of energy. Energy audit and implications.	<b>07</b>
<b>04</b>	<b>Environment friendly materials :</b> Materials for sustainability , eco-friendly and new age energy efficient and smart materials , alternative manufacturing practices , materials and selection of manufacturing processes , control on use of renewable materials , Bio-degradable materials recycling of materials.	<b>07</b>
<b>05</b>	<b>Environment Management :</b> Innovations for reuse , bio-processing technology , sustainable loading on ecosystems , concept of eco-efficiency and its implementation , Environment analysis from raw materials to disposal ( cradle to grave concept) sustainable design and materials for sustainable design , Environmental standards and legislations. ISO 14000, carbon foot print, anti-pollution boards, Environment management in business world, changing scenario in global perspective.	<b>08</b>

<b>06</b>	<b>Integrating sustainability approach:</b> Environmental issues in operating strategy, creating sustainable manufacturing, promoting sustainability awareness, sustainability rating schemes, eco-labelling programmes, human values and professional ethics in sustainable manufacturing. Encouraging innovations in sustainable manufacturing.	<b>06</b>
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**Assessment:**

**Internal Assessment for 20 marks:**

Consisting **Two Compulsory Class Tests**.

First test based on approximately 40% of contents and second test based on remaining contents (approximately 40% but excluding contents covered in Test I)

**End Semester Examination:**

Weightage of each module in end semester examination will be proportional to number of respective lecture hours mentioned in the curriculum.

1. Question paper will comprise of total **six questions, each carrying 20 marks**
2. **Question 1** will be **compulsory** and should **cover maximum contents of the curriculum**
3. **Remaining questions will be mixed in nature** (for example if Q.2 has part (a) from module 3 then part (b) will be from any module other than module 3)
4. Only **Four questions need to be solved**

**Reference Books:**

1. *Strategic Management of Sustainable manufacturing operations* (Advances in logistics operations & Management) By. Rameshwar Dubey & Angappa Gunabekaran by Innste Productivity press.
2. *Analysis for Smart energy management: Tools and applications for sustainable manufacturing.* By Seog-chanh and Alfred J.Hildreth , Springer Series.
3. *Advances in sustainable Manufacturing* By Gunther Seliger and Marwan M.K. khraishah, Springer Series
4. *Green Management* by M.Karpagam, Geetha Jaikumar, Ane Books Pvt.Ltd.
5. *Design for Environment: A guide to sustainable Product Development.*
6. *Sustainable Development* By M.K. Ghosh Roy Ane Books Pvt.Ltd,



**B.E. (Production) Sem. VIII**

Course Code	Course Name	Teaching Scheme (Contact Hours)		Credits Assigned					
		Theory	Pract	Theory	Pract	Total			
PEC801	Fluid Power & Automation	04	--	04	--	04			
PEC802	Industrial Engineering and Human Resource Management	04	--	04	--	04			
PEC803	Economics, Finance, Accounting & Costing	04	--	04	--	04			
PEDLO 803X	Department Level Optional Course III	04	--	04	--	04			
ILO802X	Institute Level Optional courses	03	--	03	--	03			
PEL801	Fluid Power & Automation Laboratory	--	02	--	01	01			
PEL802	Industrial Engineering and Human Resource Management Laboratory	--	02	--	01	01			
PEL803	Economics, Finance, Accounting & Costing Tutorial	--	02	--	01	01			
<b>Total</b>		<b>19</b>	<b>06</b>	<b>19</b>	<b>03</b>	<b>22</b>			
<b>Examination Scheme</b>									
Course Code	Course Name	Theory					Term Work	Pract. /Oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test1	Test 2	Avg.					
PEC801	Fluid Power & Automation	20	20	20	80	03	--	--	100
PEC802	Industrial Engineering and Human Resource Management	20	20	20	80	03	--	--	100
PEC803	Economics, Finance, Accounting & Costing	20	20	20	80	03	--	--	100
PEDLO 803X	Department Level Optional Course III	20	20	20	80	03	--	--	100
ILO802X	Institute Level Optional courses	20	20	20	80	03	--	--	100
PEL801	Fluid Power & Automation Laboratory	--	--	--	--	--	25	25	50
PEL802	Industrial Engineering and Human Resource Management Laboratory	--	--	--	--	--	25	25	50
PEL803	Economics, Finance, Accounting & Costing Tutorial	--	--	--	--	--	25	--	25
<b>Total</b>				<b>100</b>	<b>400</b>		<b>75</b>	<b>50</b>	<b>625</b>

<b>Course Code</b>	<b>Department Level Optional Course III</b>	<b>Course Code</b>	<b>Institute Level Elective Course II*</b>
PEDLO8011	Product Design and Industrial Marketing	ILO8021	Project Management
PEDLO8012	World Class Manufacturing	ILO8022	Finance Management
PEDLO8013	Logistics and Supply Chain Management	ILO8023	Entrepreneurship Development and Management
PEDLO8014	Plant Engineering	ILO8024	Human Resource Management
PEDLO8015	Process Control and Instrumentation	ILO8025	Professional Ethics and CSR
		ILO8026	Research Methodology
		ILO8027	IPR and Patenting
		ILO8028	Digital Business Management
		ILO8029	Environmental Management

Course Code	Course Name	Credits
<b>PEDLO8011</b>	<b>Product Design and Industrial Marketing</b>	<b>04</b>

### Objectives

1. To acquaint with various approaches in designing and developing new products.
2. To familiarize with various software solutions for designing and developing products.
3. To familiarize with modern approaches like concurrent engineering, product life cycle management, robust design, rapid prototyping / rapid tooling, etc.
4. To familiarize with characteristics of business markets, buying situations, trends in industrial marketing and relevant industrial strategies.

### Outcomes: Learner will be able to...

1. Design and develop products right from the conceptual level.
2. Demonstrate concept of computer aided product design approach.
3. Illustrate various modern approaches like concurrent engineering, product life cycle management, robust design, rapid prototyping / rapid tooling.
4. Analyze products based on ergonomics and aesthetic aspects.
5. Apply appropriate strategies in industrial marketing.
6. Demonstrate various aspects related to Industrial Marketing Communication, Advertising, Sales promotion, Publicity Media Plan.

Module	Contents	Hrs.
<b>01</b>	<p>1.1. <b>Introduction:</b> Definition of product design, Classification of products, Design by evolution, Design by innovation, Product Mix, Various phases in product development and Design, Morphology of Design, Considerations in product design, Product specifications.</p> <p>1.2. <b>Conceptual Design:</b> Market research, Generation, Selection and Embodiment of concept, Product Architecture, Customer centric product designing</p> <p>1.3. <b>Creativity:</b> Role of creativity in problem solving, Vertical and lateral thinking, Brain storming, Synectics, Group working dynamics, Adaptation to changing scenarios in economics, social, cultural and technological fronts, Anticipation of new needs and aspirations.</p> <p>1.4. <b>Materials:</b> Overview of materials including new generation materials, Tailor made material concepts, Material selection process.</p>	<b>06</b>
<b>02</b>	<p>2.1. <b>Design for manufacturing (DFM):</b> Guidelines and Methodology, Producibility requirements, Accuracy and Precision requirements, Strength considerations in Design: Criteria and objectives, Designing for uniform strength, Designing for stiffness and rigidity, Practical ideas for material saving in design - ribs, corrugations, rim shapes, bosses, laminates, etc.</p> <p>2.2. <b>Design for forged and Cast components,</b> Design for Sheet Metal processed components, powder metallurgical components, Expanded metals and wire forms</p>	<b>12</b>

	<p>2.3. <b>Designing with plastics:</b> Mechanical behavior, special characteristics and considerations, Design concepts for product features to be manufactured by various production process technologies, Special considerations for designing of components for load bearing applications.</p> <p>2.4. <b>Other DFX Principles :</b> Designs for Maintainability, Safety, Reliability, Sustainable Design</p> <p>2.5. <b>Design for Assembly (DFA):</b> DFA Index, Analysis of assembly requirements, Standardization, Ease of Assembly and disassembly, Design for bolted, welded and riveted components, Design for hinge and snap fit assemblies, maintenance, consideration of handling and safety, Modular concepts.</p>	
03	<p>3.1. <b>Product Ergonomics:</b> Anthropometry, Environmental conditions, thermal, noise, vibration, displays, illusions, Psycho and psychological aspects in design, Man-machine information exchange.</p> <p>3.2. <b>Product Aesthetics:</b> Visual awareness, Form elements in context of product design, Concepts of size, shape and texture, Introduction to colour and colour as an element in design, Colour classifications and dimensions of colour, Colour combinations and colour dynamics, Interaction / communication of colours, Psychological aspects of colours, generation of products forms with analogies from nature.</p> <p>3.3. <b>Product Graphics:</b> Graphics composition and layout, Use of grids in graphics composition, Study of product graphics and textures.</p>	06
04	<p>4.1. <b>Value Engineering:</b> Product value and its importance, Value analysis job plan, Steps to problem solving and value analysis, Value analysis tests, Value Engineering idea generation check list, Material and process selection in value engineering, Cost reduction, case studies and exercises.</p> <p>4.2. <b>Software solutions:</b> Software for drafting, modeling, assembly, detailing, CAM interfacing, Rapid tooling/rapid prototyping, etc.</p> <p>4.3. <b>Modern Applications:</b> Concurrent Engineering, Robust Design, Additive Manufacturing/Rapid Prototyping, Product Life Cycle Management techniques and application areas.</p>	08
05	<p>Introduction to Industrial Marketing, Understanding Industrial Markets, Nature of Industrial Buying, Industrial Market Segmentation, New Products and Established product strategies, Resource based and Value based strategy, Industrial Pricing: Price Determinants, Pricing Policies, Pricing Decisions, Pricing - Value based and Competition based.</p>	08
06	<p>6.1. <b>Industrial Marketing Channels:</b> Channel participants, Channel effectiveness, Marketing logistics, Physical Distribution and Marketing Strategy, Value added market channels</p> <p>6.2. Industrial Marketing Communication, Advertising, Sales promotion, Publicity Media Plan, Integrated Promotion Plan, Industrial Sales force Management, Technical Support for Marketing – customer technical services and feedback.</p>	08

### Assessment:

#### **Internal Assessment for 20 marks:**

##### **Consisting Two Compulsory Class Tests**

First test based on approximately 40% of contents and second test based on remaining contents (approximately 40% but excluding contents covered in Test I)

#### **End Semester Examination:**

Weightage of each module in end semester examination will be proportional to number of respective lecture hours mentioned in the curriculum.

1. Question paper will comprise of total **six questions, each carrying 20 marks**
2. **Question 1** will be **compulsory** and should **cover maximum contents of the curriculum**
3. **Remaining questions will be mixed in nature** (for example if Q.2 has part (a) from module 3 then part (b) will be from any module other than module 3)
4. Only **Four questions need to be solved**

#### **References Books:**

1. *Product Design & Development*, Karl Ulrich, Steven Eppinger,
2. *Design Fundamentals*, R. G. Scott.
3. *Design methods inter science*, Jones.
4. *Creative Engineering Design*, Buhl H. R.
5. *The Science of Engineering Design*, Holt, Hill Percy H.
6. *Ergonomics*, Marilyn Joyce, Ulrika Waller Steiner.
7. *Human Factors in Engineering & Design*, 4th edition
8. *Human Engineering Guide & Equipment Design*, Morgon C. T. & Others
9. *Barron D.ed, Creativity*, New York, Art Directors
10. *Design for Production*, Baldwin E. W. & Niebel B. W. Edwin, Homewood Illinois.
11. *Industrial design of plastic products*, Gordon, 2003
12. *Plastics Engineered Product Design*, Rosato, 2001
13. *Industrial Marketing Analysis, Planning and control* , Robert R Reeder, Edward G Brierty, Betty H Reeder, Prentice Hall India
14. *Industrial Marketing*, Havalder, Krishna K, Tata McGraw Hill, New Delhi.
15. *Industrial Marketing*, P.K.Ghosh, Oxford University Press, New Delli.

**T.E. (Electronics Engineering) – Semester VI**

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total
ELN601	Embedded System and RTOS	04	--	---	04	---	---	04
ELX 602	Computer Communication Network	04	--	---	04	---	---	04
ELX 603	VLSI Design	04	--	---	04	---	---	04
ELX 604	Signals and systems	04	--	@01	04	---	01	05
ELXDLO602X	Department Level Optional courses II	04	--	---	04	---	---	04
ELXL 601	Embedded System and RTOS Lab.	--	02	--	--	01	--	01
ELXL 602	Computer Communication Network Lab.	--	02	--	--	01	--	01
ELXL 603	VLSI Design Lab.	--	02	--	--	01	--	01
ELXDL0601 X	Department Level Optional courses III, lab.	--	02	--	--	01	--	01
<b>TOTAL</b>		<b>20</b>	<b>08</b>	<b>01</b>	<b>20</b>	<b>04</b>	<b>01</b>	<b>25</b>

Course Code	Course Name	Examination Scheme – Semester VI							
		Theory					Term Work	Oral /Prac	Total
		Internal Assessment (IA)	End Sem Exam Marks	Exam Duration (Hours)	Test I	Test II			
ELN601	Embedded System and RTOS	20	20	20	80	03	--	--	100
ELX 602	Computer Communication Network	20	20	20	80	03	--	--	100
ELX 603	VLSI Design	20	20	20	80	03	--	--	100
ELX 604	Signals and systems	20	20	20	80	03	25	--	125
ELXDLO602X	Department Level Optional courses II*	20	20	20	80	03	--	--	100
ELXL 601	Embedded System and RTOS Lab.						25	25	50
ELXL 602	Computer Communication Network Lab.						25	25	50
ELXL 603	VLSI Design Lab.						25	25	50
ELXDL0602 X	Department Level Optional Courses II*Lab.						25	25	50
<b>Total</b>		<b>100</b>	<b>100</b>	<b>100</b>	<b>400</b>	<b>15</b>	<b>125</b>	<b>100</b>	<b>725</b>

Course Code	Department Level Optional Course II
ELXDLO6021	Microwave Engineering
ELXDLO6022	Electronics Product Design
ELXDLO6023	Wireless Communication
ELXDLO6024	Computer Organization and Architecture

Course Code	Course Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	TW/Practical	Tutorial	Total
ELX DLO6022	Electronic Product Design	04	---	---	04	---	---	04

Course Code	Course Name	Examination Scheme						
		Theory Marks				Term Work	Oral & Practical	Total
		Internal Assessment (IA)			End Semester Examination			
		Test I	Test II	Average				
ELX DLO6022	Electronic Product Design (EPD)	20	20	20	80	---	---	100

**Rationale** :- The aim of this course is to enable students to gain practical experience & nurture their creativity in electronic product design & the objective is to provide students with a clear understanding of the practical design problems of the electronic products at an introductory level. With this course, students are expected to become familiar with the concept of designing a product as per the requirements (non-technical) & given specifications (technical), component tolerances, production constraints, safety requirements & EMC standards.

**Course Objectives:-**

1. To understand the stages of product (hardware / software) design & development
2. To learn different considerations of analog, digital & mixed circuit design
3. To be acquainted with methods of PCB design & different tools used for the same
4. To be aware of the importance of testing in product design cycle
5. To gain knowledge about various processes & importance of documentation

**Course Outcomes :-**

At the end of the course, students should gain the ability to :-

- CO-1 :- Design electronic products using user-centered designing processes
- CO-2 :- Identify & recognize essential design & production procedures of electronic products
- CO-3 :- Implement a prototype for meeting a particular requirement / specification
- CO-4 :- Demonstrate problem solving & troubleshooting skills in electronic product design
- CO-5 :- Prepare the relevant set of design documentation & present it as a case study

Module No.	Topics	Hours
	<b>INTRODUCTION TO ELECTRONIC PRODUCT DESIGN</b>	
1	Man-machine dialog & industrial design, user-centered design, elements of successful design, cognition, ergonomics, packaging & factors; design for manufacture, assembly & disassembly wiring, temperature, vibration & shock; safety, noise, energy coupling, grounding, earthing, filtering & shielding	06
	<b>HARDWARE DESIGN &amp; TESTING METHODS</b>	
2	Design process, identifying the requirements, formulating specifications, design specifications, system partitioning, functional design, architectural design, functional model v/s architectural model, prototyping, performance & efficiency measures, formulating a test plan, writing all the specifications, test procedures & test cases, design reviews, module debug & testing – black box testing, white box testing, grey box testing	10
	<b>SOFTWARE DESIGN &amp; TESTING METHODS</b>	
3	Types of software, the waterfall model of software development, models, metrics & software limitations, risk abatement & failure prevention, software bugs & testing, good programming practice, user interface, embedded & real-time software	10
	<b>PRINTED CIRCUIT BOARD (PCB) DESIGNING</b>	
4	Fundamental definitions, standards, routing topology configuration, layer stack up assignment, grounding methodologies, aspect ratio, image planes, functional partitioning, critical frequency & bypassing, decoupling; design techniques for ESD protection, guard-band & guard-rings	08
	<b>PRODUCT DEBUGGING &amp; TESTING</b>	
5	Steps of debugging, the techniques for troubleshooting, characterization, electromechanical components, passive components, active components, active devices, operational amplifier, analog-to-digital conversion, digital components, inspection & testing of components, process of simulation, prototyping & testing, integration, validation & verification, EMI & EMC issues	08
	<b>THE DOCUMENTATION PROCESS</b>	
6	Definition, needs & types of documentation, records, accountability & liability, audience, steps in preparation, presentation & preservation of documents, methods of documentation, visual techniques, layout of documentation, bills of materials, manuals – instructional or operating manual, service and maintenance manual, fault finding tree, software documentation practices	06
1 – 6	<b>TOTAL</b>	<b>48</b>



**Recommended Books :-**

1. R. G. Kaduskar & V. B. Baru, Electronic Product Design, 3<sup>rd</sup> edition, Wiley India
2. Kim Fowler, Electronic Instrument Design, 2<sup>nd</sup> edition, Oxford University Press
3. Robert J. Herrick, PCB Design Techniques for EMC Compliance, 2<sup>nd</sup> edition, IEEE Press
4. G. C. Loveday, Electronic Testing & Fault Diagnosis, 4<sup>th</sup> edition, A. H. Wheeler Publishing
5. James K. Peckol, Embedded Systems – A Contemporary Design Tool, 1<sup>st</sup> edition, Wiley Publication
6. J. C. Whitaker, The Electronics Handbook, CRC Press

**Internal Assessment (IA) :-**

Two tests must be conducted which should cover at least 80% of syllabus. The average marks of both the tests will be considered as final IA marks.

**End Semester Examination :-**

1. Question paper will comprise of 6 questions, each carrying 20 marks.
2. The students need to solve total 4 questions.
3. Q 1 will be compulsory and based on entire syllabus.
4. Remaining questions (Q 2 to Q.6) will be set from all modules.
5. Weightage of each module in question paper will be proportional to the number of respective lecture hours mentioned in the syllabus



NSSCRCE



## REPORT ON PERSONAL SUSTAINABILITY WEBINAR

**Platform: Google Meet**

**Date: September 26th, 2020**

**Speaker: Mr. George Remedios**

**No. of Volunteers attended: 68**

An interesting webinar on Personal Sustainability to educate young minds on how they can help in creating a better tomorrow was organised by NSS CRCE on September 26th. It was the first time that an event like this had to be conducted online due to the prevailing circumstances. Hosting a neat, well planned session was a challenge and the ultimate hard-work of our council members paid off. The volunteers too, were a disciplined audience and had a healthy role in making this webinar a success.

The session began with a brief introduction of the keynote speaker Mr. George Remedios, voiced by event coordinator NSS Dilton D'souza. Mr. George then moved ahead with the session with brilliant ideas one after another on how we should implement green culture in our everyday life.

The key points included were:

- Consumption of local produce
- Usage of Bio - enzymes
- Usage of wooden counterpart
- Use of Eco - Bricks

The webinar ended with a QnA session, and the attendance of the volunteers was recorded.

The key take-away from the session is that, how we, as individuals and community as a whole, can reduce our Carbon footprint for a better tomorrow.

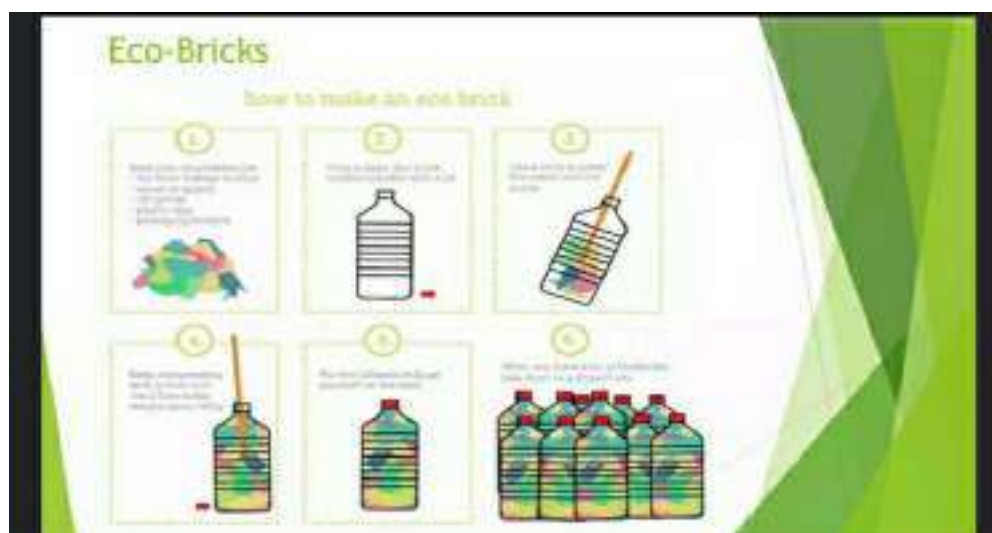


Image: How to make an Eco - Brick



**NSSCRCE**



## **REPORT ON CARBON FOOTPRINT WEBINAR**

**Date: 27<sup>th</sup> September, 2020.**

**Place: Online Workshop**

**No. of Volunteers attended:65**

Carbon Emissions have increased at an alarming level! One of the major reasons of Global Warming are Carbon Emissions. In fact, they account for more than 76% of the Greenhouse gases. They impact our planet and the climate change significantly.

Thus, it becomes really important for us to be aware of all the necessary information, so that we can make a change! Keeping that in mind, we at **NSS CRCE**, organized an Online Workshop on Carbon Footprint with Only Planet.

One of the members of Only Planet, Sunita Rajesh, provided us with all the information on Carbon Emissions, Carbon Footprint, and about the alternatives which we can make everyday to lower our Carbon Footprint. For Example – Using Reusable Masks and Gloves rather than the Disposable ones.

She spoke about the different greenhouse gases, about the extensive use of plastic and how drastically it has affected our planet. She went on with the major contributors of Carbon Emissions, which is Transportation, Electricity and Industry.

To make our members understand better about Carbon Footprint, she demonstrated on how to use the Carbon Footprint Calculator. This calculator approximately measures your carbon footprint which you have been contributing to the planet, knowingly or unknowingly. Many Students volunteered and calculated their footprint along with Sunita Ma'am.

This was followed by a very active Q & A session, which included questions like, What should be an Ideal Carbon Footprint, How does eating non - veg promote more Carbon Footprint and many more.



NSSCRCE



## REPORT ON COASTAL CLEANUP DAY WEBINARS

**Platform: YouTube Live**

**Date: 16<sup>th</sup> September to 19<sup>th</sup> September 2020**

**No. of Volunteers attended: 66**

On the occasion of International Coastal clean-up day 2020, National Service Scheme Unit of Fr. Conceicao Rodrigues college of Engineering with United Way Mumbai has organized a week long webinar series by experts in collaboration with the National Centre for Coastal Research, Ministry of Earth Sciences Gov. of India. This Week long event will be focused on topics related to marine pollution ranging from micro plastics, marine litter and various research projects on marine conservation.

Medium used was YouTube Live where the doubts of all the members were solved on the live chat and the entire week long sessions were very informative and gave a better understanding of the waste in the oceans and how they drastically affect the marine life and the entire ecosystem. It amplifies the task we need to carry out to maintain our system and our responsibility and how to deal with these hazardous human waste. We were given a detailed explanation on how the pollutants in form of marine micro plastics are created at the first place and how this has become a serious threat and how to keep track. The experts in the particular field had experience in this field which made it really interesting and interactive.

DATE	GUEST SPEAKER
16 SEP, 2020	DR. RAJESH SINGH, SENIOR SCIENTIST, NATIONAL BUREAU OF OCEANOGRAPHY (NBO-IISRO), NEW DELHI, INDIA
17 SEP, 2020	PROF. P. PARASURAM, ENVIRONMENTAL & ATMOSPHERIC SCIENCE, SRMIST, KAMARAJ UNIVERSITY, CHENNAI, INDIA
18 SEP, 2020	MR. PETER WILSON, SENIOR RESEARCHER, OCEANIC & COASTAL SCIENCE, NCCCR, GOVT. OF INDIA
19 SEP, 2020	PROF. DR. ANJANA K. SINGH, HEAD, DEPT. OF CHEMISTRY, MICROPLASTIC RESEARCH OF IASRI, GURGAON, INDIA

Day 1 :6<sup>th</sup> September 2020

Topic: Micro Plastics: an Emerging threat to Marine Environment and Biodiversity

Guest Lecturer: Dr. Mahua Shah, senior scientist COD, National institute of oceanography (NIO-CSIR)

INTERNATIONAL COASTAL CLEANUP DAY

Join us for a week-long series of webinars in collaboration with National Centre for Coastal Research, Ministry of Earth Sciences, Govt. of India

WEBINAR SERIES DAY 2: SEPTEMBER 16, 2020

Time: 3:30 PM IST on YouTube

DR MAHUA SHAH, SENIOR SCIENTIST COD, NATIONAL INSTITUTE OF OCEANOGRAPHY (NIO-CSIR)

TOPIC: MICRO-PLASTICS: AN EMERGING THREAT TO MARINE ENVIRONMENT & BIODIVERSITY

YouTube live link: <https://www.youtube.com/watch?v=...>

Environmental impacts of microplastics are

- Physical impacts
- Chemical impacts
- Biological impacts
- Ecological impacts
- Socio-economic impacts

**MICROPLASTICS IN BIOTA**

Environmental impact of microplastics: a major concern to tackle

- Loss of biodiversity
- Transfer of pollutants
- Transfer of nutrients
- Transfer of microplastics

**CHALLENGES AND KNOWLEDGE GAP: FUTURE PLAN**

- Most of the report on MPs are either marine, coastal or fresh water systems. Further, we need to focus the same for terrestrial, aquatic systems like the rivers.
- More comprehensive study need to be expanded (fresh, brackish water, oceans)
- Ecological evaluation of MPs for identification of POPs and priority control by MPs need to be done more proactively need IOC/ICS

There is a high need to do a number of study to evaluate toxicity of MPs and its associated contaminants in different life forms as that possible toxic effects (e.g. economic, diversity or human and other higher life forms) could be monitored.

- Improve intelligence

Day 2: 17<sup>th</sup> September 2020

Topic: Micro plastics in Artic Environment

Guest lecturer: Prof. E.V. Ramasamy Environmental & Atmospheric science, Kerala, India.

INTERNATIONAL COASTAL CLEANUP DAY

Join us for a week-long series of webinars in collaboration with National Centre for Coastal Research, Ministry of Earth Sciences, Govt. of India

WEBINAR SERIES DAY 2: SEPTEMBER 17, 2020

Time: 3:30 PM IST on YouTube

PROF. E.V. RAMASAMY, SCHOOL OF ENVIRONMENTAL SCIENCES, MAHATMA GANDHI UNIVERSITY, KOTTAYAM, KERALA, INDIA.

TOPIC: MICRO-PLASTICS IN ARCTIC ENVIRONMENT

YouTube live link: <https://www.youtube.com/watch?v=...>

**Great Pacific garbage patch**

- The Great Pacific garbage patch, also described as the Pacific gyre vortex, is a gyre of marine debris particles in the central North Pacific Ocean.
- The patch is characterized by exceptionally high relative concentrations of pelagic plastics, chemical sludge and other debris trapped by the currents of the North Pacific Gyre.

The area of increased plastic particles is located within the North Pacific Gyre, one of the five major oceanic gyres.

Chat publicly as Gaurav-Sudh



**Day 3: 18<sup>th</sup> September 2020**

**Topic:** Marine Litter- Turning the Tide & Micro Plastic Research

**Guest Lecturers:**

- 1) Mr. Peater Kohler, Senior Marine Litter Scientist
- 2) Dr. DanjaHoehn, Scientist at center for environment fisheries and aquaculture science (CEFAS), United Kingdom.

**INTERNATIONAL COASTAL CLEANUP DAY**

Join us for a week-long series of webinars in collaboration with National Centre for Coastal Research, Ministry of Earth Sciences, Govt. of India

**WEBINAR SERIES DAY 2- SEPTEMBER 18, 2020**  
Time: 3:00 PM IST on YouTube

**MR. PETER KOHLER SENIOR MARINE LITTER SCIENTIST & DR DANJA HOEHN SCIENTIST AT CENTRE FOR ENVIRONMENT FISHERIES AND AQUACULTURE SCIENCE (CEFAS), UK**

**TOPICS**

**MARINE LITTER - TURNING THE TIDE & INDIA-UK PROGRAM ON MARINE LITTER & MICRO PLASTIC RESEARCH**

YouTube live link: <https://www.youtube.com/watch?v=...>

**Scientific evidence and advice**

- **International**
  - CLIP - Monitoring and assessment and management data to inform decision makers for best quality in the Commonwealth.
  - ICES - Chair the technical Working Group on Marine Litter in Northern Oceans
- **Research and development.**
  - INCOG - biodegradable fishing gear and similar decommissioning plastic pollution in long term.
  - Rapid screening of microplastics - developing techniques with FTIR and Nile Red dye
  - Autonomous monitoring - working with partners prototyping & developing autonomous monitoring systems for marine litter.
- **Outreach & training**
  - Training in microplastics and Microplastic sampling and analysis.
  - Developing reference and engaging outreach materials.

**Day 4 : 19<sup>th</sup> September 2020**

**Topic:** Marine Pollution and Conservation research to protect the ocean

**Guest Lecturer:** Prof. BhavaniNarayanswamy head, Deep Sea Ecosystem & Micro plastic Research head of SAMS Graduate School, Scottish Association for Marine Science, Scottish Marine Institute, United Kingdom

**Problems: Pellets (nurdles) easily lost**

**Microplastic Type**

**Microplastic Cc**

**3255m depth 1 location**



NSSCRCE



## REPORTONRECYCLE FEST

**Deadline: 22<sup>nd</sup> October, 2020.**

**No. of Volunteers attended:34**

Every year **NSS CRCE** organizes events through which our members are able to contribute to the society. Be it Bandra Fair Volunteering with Mumbai Police or Multiple Beach Clean-Ups. But this year due to the pandemic, our hand were tied and we were only able to host webinars on various awareness topics. So, we thought of doing something different and interactive. Something through which we can contribute to the society. That's when we organized *Recycle Fest*.

In Recycle Fest, all of our members were told to make something useful out of the waste lying around in their house. This waste could be anything like Plastic Bottle, CD's, Shampoo Bottles, etc.

The benefits of Recycling are exceptional. Recycling reduces the amount of waste which would otherwise be sent to landfills. It prevents pollution and saves energy. And, most importantly, it reduces an individual's carbon footprint.

We received an outstanding response from both our NSS Members and Non-Members, with over 40+ students submitting their ideas.

We also had our Top – 15 who had performed wonderfully. Some of the Ideas included Vase from Plastic Bottles, Coffee Coaster, Plant Vase, Diwali Kandeel from Medicine Bottle and a lot more.

The pictures of all these creative ideas have been attached below.









NSSCRCE



## REPORT ON CLIMATE CHANGE WEBINAR

**Date:** 19<sup>th</sup> November, 2020.

**Mode:** Microsoft Teams

**No. of Volunteers attended:**

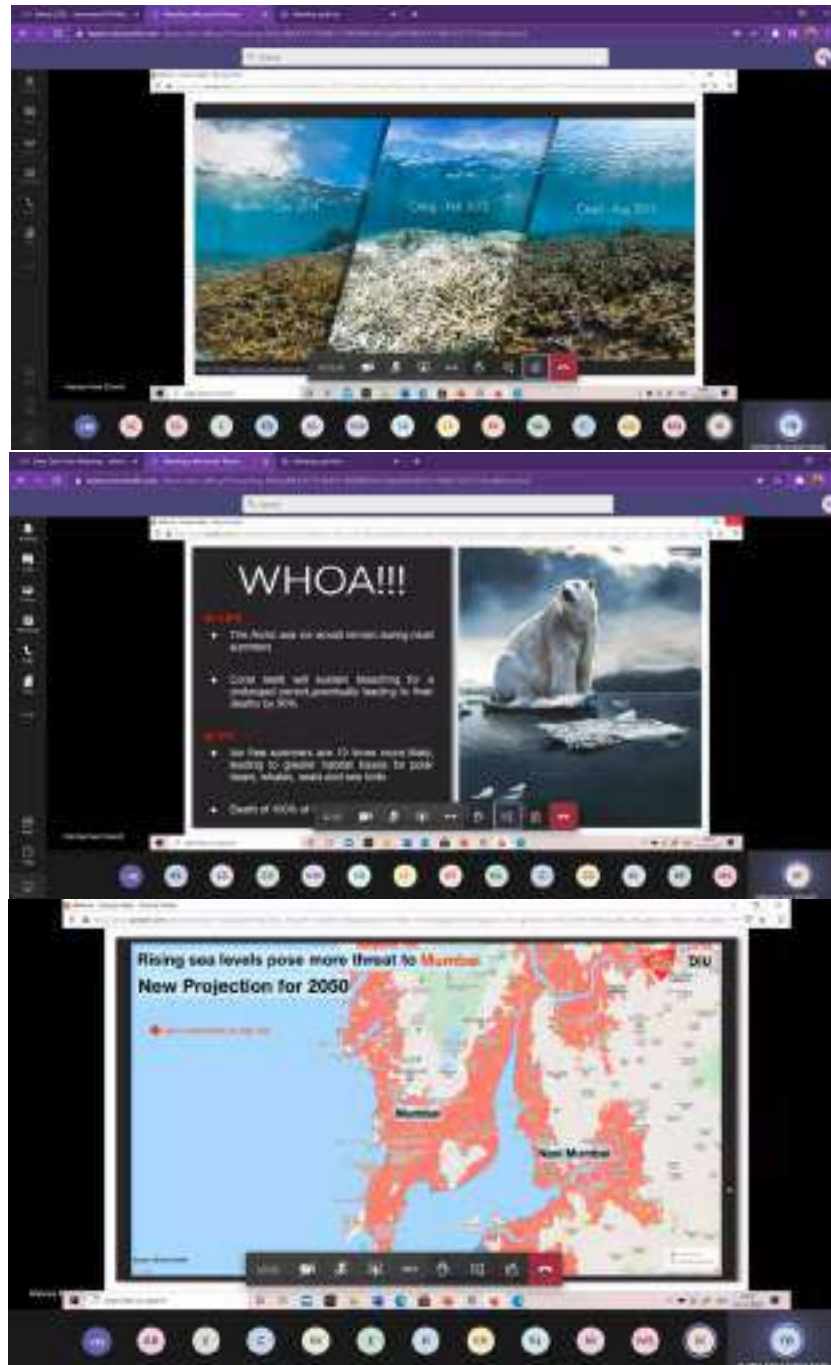
**NSS CRCE** organized a webinar with Climate Crew on a highly important topic. This topic requires action on an immediate basis. This is something everyone has been ignoring since a very long time. It is *Climate Change*.

The consequences of Climate Change are so catastrophic and toxic that one can't imagine. We have very less amount of time and there are very few people who are aware about this. Thus, the need for this webinar was important so that we can make more and more people aware about this.

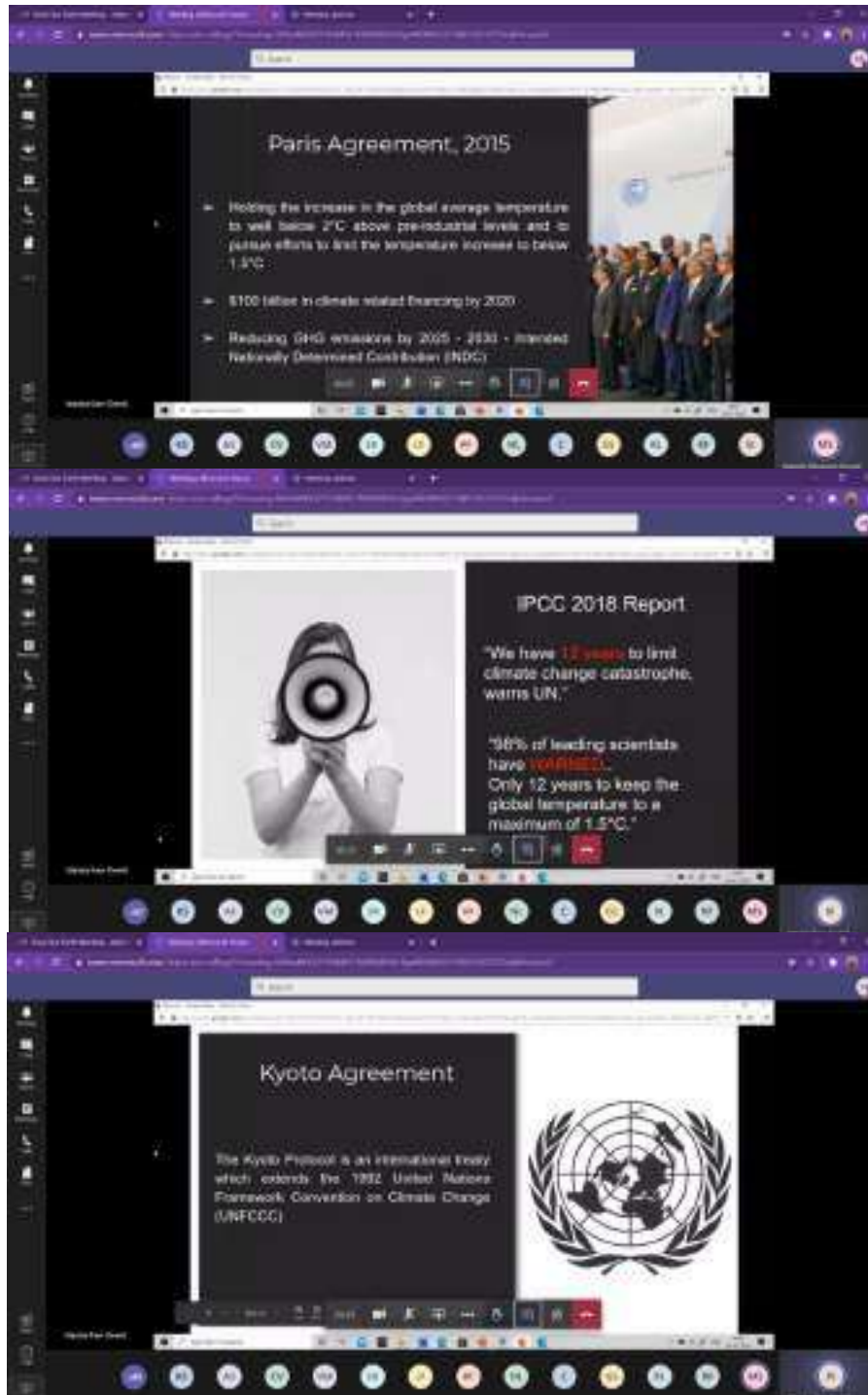
The Speakers from Climate Crew provided every single information about Climate Change and Global Warming. They spoke how Climate Change will increase the Temperature, cause more Droughts, Sea levels will continue to rise, Heat waves and Hurricanes will just get stronger and Arctic is likely to become ice - free.



The Speakers made sure that the webinar is not getting boring. They kept on engaging with our members. Asked them questions. Replied to their doubts. And stuck to Scientific facts. Their way of explanation by using Pictures and Animations were great.



They also explained how everything started (from the beginning) and what kind of measurements other countries are taking in order to control Climate Change.



The best part about the webinar was, that they were trying to explain everything in a scientific way. Which was pretty easy to understand as you actually see how this is happening and how that is getting formed and what is the reason for all that ice melting.





**NSSCRCE**



## **REPORT ON DOCUMENTARY ON SUSTAINABILITY**

**Platform: Google Meet**

**Date: 21<sup>st</sup> Match, 2021**

**No. of Volunteers attended:52**

NSS CRCE organised an informative session on global sustainability. Global sustainability an important concept defining the co-existence between humans and nature. The sole purpose of this session was depicting the importance we as humans acknowledge nature and in-turn improve human lives by living in harmony with mother nature.

The session began at 4pm with a brief introduction as to what sustainability is and its importance. Then we presented our members with a documentary put together by a channel on YouTube called Complexity Labs. This documentary covered all the important points regarding global sustainability and was also soothing and relaxing to the eye at the same time. It explained all the intricate co-relation among the several beings in nature and how to achieve a balanced ecosystem.

This session was a really inspiring and taught all our members the importance of nature and its co-existence with all living organisms.



A still from the documentary explaining the concept of diversity