Fr. Conceicao Rodrigues College of Engineering
Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50
Department of Computer Engineering
B.E. (Computer) (semester VIII)

(2018-2019)

Course Outcomes & Assessment Plan

Subject: Human Machine Interaction (HMI) (CPC802)   **Credits-5**

Syllabus:

1. Introduction
Introduction to Human Machine Interface, Hardware, software and operating environment to use HMI in various fields,
The psychopathology of everyday things – complexity of modern devices; human-centered design; fundamental principles of interaction; Psychology of everyday actions- how people do things; the seven stages of action and three levels of processing; human error.

2. Understanding goal directed design
Goal directed design; Implementation models and mental models; Beginners, experts and intermediates – designing for different experience levels; Understanding users; Modeling users – personas and goals.

3. GUI
Benefits of a good UI; popularity of graphics; concept of direct manipulation; advantages and disadvantages; characteristics of GUI; characteristics of Web UI; General design principles.

4. Design guidelines
Perception, Gesalt principles, visual structure, reading is unnatural, color, vision, memory, six behavioral patterns, recognition and recall, learning, factors affecting learning, time.

5. Interaction styles
Menus; windows; device based controls, screen based controls;

6. Communication
Text messages; feedback and guidance; graphics, icons and images; colours

Course Objectives:
1. To stress the importance of a good interface design.
2. To understand the importance of human psychology in designing good interfaces.
3. To motivate students to apply HMI in their day – to – day activities.
4. To bring out the creativity in each student – build innovative applications that are user friendly.
5. To encourage students to indulge into research in Machine Interface Design.

Text Books:
1. Alan Dix, J. E. Finlay, G. D. Abowd, R. Beale "Human Computer Interaction", Prentice Hall.
2. Wilbert O. Galitz, "The Essential Guide to User Interface Design", Wiley publication.
3. Alan Cooper, Robert Reimann, David Cronin, "About Face3: Essentials of Interaction design", Wiley publication.
4. Jeff Johnson, "Designing with the mind in mind", Morgan Kaufmann Publication.
5. Donald A. Normann, "Design of everyday things", Basic Books; Reprint edition 2002.

Reference Books:
1. Donald A. Norman, "The design of everyday things", Basic books.
2. Rogers Sharp Preece, "Interaction Design:Beyond Human Computer Interaction", Wiley.
3. Guy A. Boy "The Handbook of Human Machine Interaction", Ashgate publishing

Course Outcomes:

Upon completion of this course students will be able to:

CPC802.1 Design user centric interfaces. (Apply)

CPC802.2 Apply HMI principles in their day-to-day activities. (Apply)

CPC802.3 Criticize existing interface designs and improve them. (Evaluate)

CPC802.4 Develop interactive products up to the prototype stage for social and technical task. (Apply)

Mapping of CO and PO/PSO

Relationship of course outcomes with program outcomes: Indicate 1 (low importance), 2 (Moderate Importance) or 3 (High Importance) in respective mapping cell.

	PO1 (Engg Know)	PO2 (Ana)	PO3 (De sign)	PO4 (inve stiga)	PO5 (tools)	PO6 (engg Soci)	PO7 (Env)	PO8 (Eth)	PO9 (ind Team)	PO10 (comm.)	PO11 (PM)	PO12 (life Long)
CPC802.1	2	2	3		3							
CPC802.2	2	2										
CPC802.3	2	2	3		3							
CPC802.4	2	2	3		3	2						
Total	8	8	9		9	2						
CO –PO Matrix	2	2	3		3	2						

CO	PSO1	PSO2
CPC802.1	3	
CPC802.2	2	
CPC802.3	3	2
CPC802.4	3	2
CO-PO Matrix	2.75	2

CO assessment tools

CPC802.1 Design user centric interfaces.

Direct Methods (80%): (T1+T2) + A + P + End sem

CO1dm = 0.2T + 0.2A + 0.3Lab + 0.2UTh + 0.1UPr.

Indirect Method (20%): Survey

CPC802.2 Apply HMI principles in their day-to-day activities.

Direct Methods (80%): T1 + A + End sem

CO2dm = 0.3T + 0.4A + 0.2UTh + 0.1UPr

Indirect Method (20%): Survey

CPC802.3 Criticize existing interface designs, and improve them

Direct Methods (80%): T2 + P + A + End sem

CO3dm = 0.2T + 0.2Lab + 0.3A + 0.2UTh + 0.1UPr

Indirect Method (20%): Survey

CPC802.4 Develop interactive products up to the prototype stage for social and technical task.

Direct Methods (80%): 0.7P + 0.2 UTh + 0.1 UPr

Indirect Method (20%): Survey

Course outcomes Target:

CPC802.1 : 2.7

CPC802.2 : 2.7

CPC802.3 : 2.5

CPC802.4 : 2.7

Previous Year's CO attainment:

CO	Description	2017-18	2016-17	2015-16
CPC802.1	Design user centric interfaces	2.52	2.36	2.52
CPC802.2	Apply HMI principles in their day-to-day activities	2.76	2.2	2.2
CPC802.3	Criticize existing interface designs, and improve them	2.04	2.2	2.36
CPC802.4	Develop interactive products up to the prototype stage for social and technical task.	2.76	2.52	2.84

Content Beyond Syllabus:

1. One study assignment on advance topic in HMI (EXP 10)
2. Technical paper presentation
3. Guest Lecture that covered few case studies in HCI

Curriculum Gap:

1. Some of the advance HMI techniques such as Data gloves, Brain computer interface etc. have not been discussed in the syllabus. Students need to understand how these advance HMI techniques are practically applied in the real world applications. To bridge this gap, students have been given one study assignment in which they have to prepare a detailed report on any one advance topic in HMI that is not covered in the syllabus.
2. Also to keep the students updated with the recent advancements in HMI, students will study one recent publication / technical in the field of HMI and present it in front of the class. This exercise will help inculcate lifelong learning in students.

Rubrics for the Lab Experiments:

Performance Indicator	BS- Below standard	MS- Meets Standard	ES – Exceeds Standard
Contextual Inquiry (2)	Does not have any idea about the client or existing applications (0)	Research on existing Applications done. Does not give too much importance to the particular client/ user (1)	Research on the users' behavior, interests and their requirements. Has knowledge on such existing applications (2)
Design of user interfaces (2)	Design is not tied to findings from Contextual Inquiry, or other research (0)	Most aspects of the design are tied to contextual findings and research. (1)	Design is completely tied to contextual Inquiry, and research (2)
Follows HMI design principles(Visually pleasing composition, logical navigation, use of proper color, focus, grouping, contrast (2)	None of the design principles followed. Interface is difficult to use because of demands on memory, learning, or the visual/ auditory /motor system (0)	Applied few of the design principles. Interface does not place much load on memory, learning, or the visual/auditory/motor system (1)	Understood and applied all the general design principles. Overall the design is good and innovative. (2)
Test Cases and conclusion (2)	Usability test not been conducted (0)	Usability test conducted and derived appropriate conclusion from the test (1)	Usability test conducted with all the design aspects covered during the test and derived appropriate conclusion.(2)
Post Lab Assignment (2)	Answers are irrelevant to the question or the problem(0)	Basic points have been covered but not in detail (1)	Basic points covered with appropriate justification (2)

List of Lab Experiments

Sr. No.	Topic	Experiment	CO
1	Know the clients (Design any one of the applications listed)	a. Children (4-5 years of age): An application to teach math/english. b. Teenagers: Design a digital diary for young teens to help them overcome various social pressures they deal with during their teen years. The diary should also be like a self help tool which would help them deal with incidents like bullying, peer pressure, etc. This is an open project and you can think in any direction to make the children sail through their teen years while trying to discover life around them. c. Older generation: Folks from the older generation has been very wary of using their credit card on the Internet. They have various concerns when it comes to paying their bills. Also because of their old age, it will be beneficial for them to use the internet and pay their phone, electricity, gas, etc. bills d. Rural people: ATVM for train ticketing in rural area	1,4

2	Know the user/client	Developing an interface for an application for Physically or visually challenged people	1,2,4
3	Requirement Gathering Technique	Design story boards from any two scenarios for any software system.	1
4	Understand the trouble of interacting with machines	Redesign interfaces of home appliances like microwave oven, land-line phone, fully automatic washing machine.	1,3,4
5	Learn HMI design principles – heuristic evaluation	Identify 5 different websites catering to one specific goal (eg. Goal – on-line shopping and 5 different websites – ebay, amazon, flipkart, zovi, myntra) and perform a competitive analysis on them to understand how each one caters to the goal, the interactions and flow of the payment system and prepare a report on the same	1,3
6	Learn the importance of menus and navigation	Website redesign: News websites like CNN are always cluttered with information. It takes the user a few minutes to find his way through and maybe more minutes to look for some specific information. Redesign the news websites to make it look less cluttered, provide relevant information (a person sitting in Russia should not get US news as top news), intelligently dig Information that he might be interested in based on his searches on the web.	1,3,4
7	Icon designing	Choose a unique domain, design a few icons and show how it can be accommodated on an interface	1
8	Study of Serial Positioning effect, Webber's Law, Fitt's Law	To study serial Positioning effect, Fitt's law and Webber's law. (Use IITs Virtual labs) (New)	1,2
9	Understand the various input methods available for interaction	Concept generation: Study the various technologies for typing – standard keyboards QWERTY, T9 (predictive text), multi-touch (SYWPE, etc.), gestures and brainstorm on the various ways in which you could improve one of the existing technologies. You could choose any of the different input types	
10	Study of advance HMI topic	To study advance topic in HMI that is not covered in syllabus and prepare a report for the same.	PO12
11	Technical paper presentations	study one recent publication / technical in the field of HMI and present it in front of the class. This exercise will help inculcate lifelong learning in students.	PO12

Assignments and Rubrics for evaluation:

Theory Assignment 1 (CO2): Apply HMI in their day-to-day activities.
Date of Assignment **: 21-02-2019**
Date of Submission **: 05-03-2019**

1. Take any action that you perform in your day-to-day life and describe seven stages of the specified action along with the explanation. Also relate every stage with one of the three levels of processing i.e. Visceral, Behavioural and reflective level. Give justification why particular stage is related to the specified processing level.
2. Discuss any four cases of interfaces that you have used in your day-to-day life and faced a problem with the interfaces. The interfaces could be any interface (E.g. it could be a simple door, a printed document or any object) Give suggestions to improve those interfaces.
3. The goal of this assignment is to emphasize the form-shaping capabilities of the human visual perceptual system, particularly with regards to how designers may use these effects to create interesting designs. Students task: Students need to find good examples of the following gestalt principles –
   1. Proximity 2. Similarity   3. Closure 4. Continuity   5. Figure/ Ground
   Online in an existing interface. Existing interface can be a mobile app, a web site or any company's logo. Explain each principle and then place a screen shot of each example. You should have 5 (or more) screenshots in your write-up—one for each principle (even if a given interface utilizes more than one Gestalt principle emphasize one for each example). Accompany the screenshot with the original source link and identify which Gestalt principle (or principles) occur in each screenshot.

Rubrics for Evaluation of Assignment1:

Indicator	Unsatisfactory	Satisfactory	Good	Excellent	Marks
Level of content (4)	Major points are omitted or addressed minimally (1)	All major topics are covered, the information is accurate(2)	Most major and some minor criteria are included. Information Is accurate (3)	All major and minor criteria are covered and are accurate. (4)	
Organization (4)	Very poor readability and not structured (1)	Poor readability and somewhat structured (2)	Good Readability and structured(3)	Very well written and structured (4)	
Support of relevant Diagrams and Examples (2)	No use of diagrams or any example to explain the answer (0.5)	Some of the answers are supported by diagrams and examples (1)	Most answers are supported by examples and diagrams (1.5)	All answers are supported with diagrams and appropriate examples where ever needed (2)	
Total					

Theory Assignment 2 (CO3): Criticize existing interface designs and improve them.

Date of assignment: 21-02-2019
Date of submission: 15-03-2019

Q-1 Apply HMI principles and redesign innovative and usable interface for any printed hardcopy document like… Local train ticket, Aadhar card, driving license etc.
Students are free to design any such document.
1. Attach the print of existing design
2. Attach the print of your design.
3. Explain how your design shows improvement over existing design.
4. Explain why you design is innovative.

Q-2 Case study: Perform heuristics evaluation of any one live web site and discover any potential usability weaknesses. Also prepare a report on evaluation findings and your suggestions to overcome the given problem.
The following points should be considered.
1. Visually pleasing composition
2. Organising screen elements
3. Choosing colours
4. Search facility
5. Browsing, scanning and searching
6. Navigation facility
7. Presentation of text
8. Focus and emphasis
9. Feedback and help

Other than this any other relevant findings should also be included.

Rubrics for Evaluation of Assignment2:

Indicator	Unsatisfactory	Satisfactory	Good	Excellent
Design of interface (4)	Poor design , does not follow HMI guidelines (1)	Follows HMI principles and guidelines and design is satisfactory (2)	Good design. Applies HMI principles and guidelines. (3)	Understood and applied all the general design principles. Overall the design is good and innovative (4)
Improvement in existing design (4)	No improvement in existing design (1)	Few improvements suggested(2)	New design removes many flaws present in existing design (3)	New design is excellent and innovative (4)
Support of relevant Diagrams and Examples (2)	No use of diagrams or any example to explain the answer (0.5)	Some of the answers are supported by diagrams and examples (1)	Most answers are supported by examples and diagrams (1.5)	All answers are supported with diagrams and appropriate examples where ever needed (2)

Theory Assignment 3
CO1: Design User centric Interfaces.

Date of assignment: 15-03-2019
Date of submission: 26-03-2019

Q-1 In the state of Maharashtra, rationing department want to provide self help portal for its customers. The portal consists of information about basic need supplies, online application for ration cards, schemes for low income groups, adding a name of family members, deletion of name, complaints and others facilities. Being a Subject Matter Expert (SME) provide the detail analysis and for the same provide the interface that will be used by people in all districts of Maharashtra.

Q-2. A Petroleum Company wants to establish unmanned petrol pumps at major locations. Where vehicle owners can fill the petrol on their own and payment will be either by cashless in the form of credit/ debit card or at some points there may be Bank Note Payment (cash) by automatic machines. Following are some functional requirements. There will be automatic gate that will not allow owners to take their vehicles if they did not make the payment. Provide detailed analysis and possible interaction design that will help to execute the proposed system .Your design should contain suitable diagram.

Rubrics for Evaluation of Assignment3:

Performance Indicator	Unsatisfactory	Satisfactory	Good
Contextual Inquiry (3)	Does not have any idea about the client or existing applications (1)	Research on existing Applications done. Does not give too much importance to the particular client/ user (2)	Research on the users' behavior, interests and their requirements. Has knowledge on such existing applications(3)
Design of user interfaces (4)	Design is not tied to findings from Contextual Inquiry, or other research. (1-2)	Most aspects of the design are tied to contextual findings and research. (3)	Design is completely tied to contextual Inquiry, and research (4)
Follows HMI design principles (3)	None of the design principles followed. Interface is difficult to use because of demands on memory, learning, or the visual/auditory/ motor system.(1)	Applied few of the design principles. Interface does not place much load on memory, learning, or the visual/auditory/motor system. (2)	Understood and applied all the general design principles. Overall the design is good and innovative. (3)

Course exit survey:

Sr. No	Question	Strongly agree	Agree	Disagree	Strongly Disagree
1	I am able to design user centric interfaces				
2	I am able to apply HMI in their day-to-day activities				
3	I am able to criticize existing interface designs and improve them				
4	I am able to develop interactive products up to the prototype stage for social and technical task				

Lesson Plan : HUMAN MACHINE INTERACTION

Semester VIII   Year: 2018-19

Modes of Content Delivery:

I	Class Room Teaching	v	Self Learning Online Resources	Ix	Industry Visit
Ii	Tutorial	vi	Slides	X	Group Discussion
Iii	Remedial Coaching	vii	Simulations/Demonstrations	Xi	Seminar
Iv	Lab Experiment	viii	Expert Lecture	Xii	Case Study

Lect. No.	Portion to be covered	Hrs/Module	Planned date	Actual date	Content Delivery Method/Learning Activities	Books
1	Introduction to the subject. Informing Cos	8	1/1/19	3/1	Class room teaching /Slides	2,3,4,5
2	Introduction to Human Machine Interface .		2/1/19	4/1	Class room teaching/Slides/ **[Video1- History of HMI]**	2,3,4,5
3	Hardware, software and operating environment to use HMI in various fields		3/1/19	4/1	Class room teaching/Slides	2,5
4	The psychopathology of everyday things – complexity of modern devices		4/1/19	8/1	Class room teaching/Slides	2,5
5	human-centered design; fundamental principles of interaction		8/1/19	9/1	Class room teaching/Slides	2,5
6	Psychology of everyday actions- how people do things		9/1/19	10/1	Class room teaching /Slides **[Video2 – Norman's door]**	2,5
7	the seven stages of action and three levels of processing		10/1/19	11/1	Class room teaching/Slides **[Video 3 – Gulf of Evaluation]**	2,5
8	human error		11/1/19	11/1	Class room teaching/Slides	2,5
9	Goal directed design	6	15/1/19	15/1	Class room teaching/Slides **[Video 4 – Contextual Inquiry]**	3
10	Implementation models and mental models;		16/1/19	16/1	Class room teaching/Slides	2, 3
11	Beginners, experts and intermediates		17/1/19	17/1	Class room	2,3

					teaching/Slides	
12	designing for different experience levels		18/1/19	18/1	Class room teaching/Sli-des	3
13	Understanding users		22/1/19	22/1	Class room teaching/Slides	3
14	Modeling users – personas and goals.		23/1/19	23/1	Class room teaching/Slides/ Class room activity **(Think-Pair-Share)**	3
15	Benefits of a good UI	8	24/1/19	24/1	Class room teaching/Slides	2
16	popularity of graphics		25/1/19	29/1	Class room teaching/Slides	2
17	concept of direct manipulation		29/1/19	30/1	Class room teaching/Slides	2
18	advantages and disadvantages		30/1/19	7/2	Class room teaching/Slides	2
19	characteristics of GUI		1 / 2/19	20/2	Class room teaching/Slides	2
20	characteristics of Web UI		7/2/19	21/2	Class room teaching/Slides	2
21	General design principles		8/2/19	22/1	Class room teaching/Slides **[Video 5 – Usability Heuristics]**	2
22	General design principles		12/2/19	26/2	Class room teaching/Slides	2
23	Perception, Gestalt principles	6	18/2/19	27 / 2	Class room teaching/Slides/ **[Video 6 – Gestalt Principles]**	4
24	visual structure, reading is unnatural		20/2/19	28/2	Class room teaching/Slides	4
25	color, vision, memory		21/2/19	28/2	Class room teaching/Slides	4
26	six behavioral patterns,		22/2/19	1/3	Class room teaching/Slides	4
27	recognition and recall		26/2/19	5/3	Class room teaching/Slides	4
28	learning, factors affecting learning, time.		27/2/19	6/3	Class room teaching/Slides	4
29	Menus: structure of menu, functions of menu, content of menu, formatting of menu	8	28/2/19	7/3	Class room teaching/Slides	2
30	Menus: Phrasing menus, selecting menus and navigating menus, Kinds of menus		1/3/19	8/3	Class room teaching/Slides	2
31	Windows: Characteristics, Components of window, presentation style, Types of window		5/3/19	12/3	Class room teaching/Slides	2

32	Windows: Organizing window functions, window operations, web system		7/3/19	13/3	Class room teaching/Slides	2
33	Device based controls : Characteristics of device based controls,		8/3/19	14/3	Class room teaching/Slides	2
34	Device based controls: Selecting proper device based controls		12/3/19	14/3	Class room teaching/Slides	2
35	Screen based controls: Text Box, Selection controls, Combination controls		13/3/19	19/3	Class room teaching/Slides	2
36	Screen based controls: other controls like slider, progress bar, date picker etc., Presentations controls, Selecting proper controls.		14/3/19	20/3	Class room teaching/Slides	2
37	Text messages: Word, sentences, messages and text	10	19/3/19	22/3	Class room teaching/Slides	2
38	Text messages: Text for web pages		20/3/19	22/3	Class room teaching/Slides	2
39	Feedback and guidance: Providing the proper feedback		22/3/19	26/3	Class room teaching/Slides	2
40	Feedback and guidance: Guidance and assistance		26/3/19	26/2	Class room teaching/Slides	2
41	Graphics: Graphics , images , pictures, videos		27/3/19	27/3	Class room teaching/Slides	2
42	Graphics: Drawing, animation, audition , combining mediums		28/3/19	28/3	Class room teaching/Slides	2
43	icons and images: Kinds of icons, characteristics of icons, choosing icons		29/3/19	28/3	Class room teaching/Slides	2
44	icons and images: Creating images , drawing images, icon animation and audition, the design process and presentation		2/4//19	29/3/19	Class room teaching/Slides	2
45	Colours: Uses of color, Possible problems with color, Choosing colors – general guidelines		3 / 4/19	3/4/19	Class room teaching/Slides	2
46	Colours: Choosing colors for text, choosing colors for statistical graphics, choosing colors for web		4/4/19	**Self Study**	Slides, Material Uploaded on Moodle	2

Video Links:

Sr. No	Title	Link	Source
1	History of HMI	https://www.youtube.com/watch?v=LJ0sIHj-OWo	Youtube
2	Norman's Doors	https://www.youtube.com/watch?v=yY96hTb8WgI	Youtube
3	Gulf of evaluation	https://www.youtube.com/watch?v=bg4UwyPPZ6U	Youtube
4	Usability Heuristics	https://www.youtube.com/watch?v=B56Bz3T_aEw	Youtube
5	Contextual Inquiry	https://nptel.ac.in/courses/106106177/4	NPTEL
6	Gestalt Principles	https://www.interaction-design.org/literature/topics/gestalt-principles	Interaction design Foundation
7	Low Fidelity and High Fidelity Prototyping	https://nptel.ac.in/courses/106106177/13	NPTEL

Total available lectures = 45,
Extra lectures required = 01,
No. of lectures actually conducted = 42

T e x t B o o k s :
1. Alan Dix, J. E. Finlay, G. D. Abowd, R. Beale "Human Computer Interaction", Prentice Hall.
2. Wilbert O. Galitz, "The Essential Guide to User Interface Design", Wiley publication.
3. Alan Cooper, Robert Reimann, David Cronin, "About Face3: Essentials of Interaction design", Wiley publication.
4. Jeff Johnson, "Designing with the mind in mind", Morgan Kaufmann Publication.
5. Donald A. Normann, "Design of everyday things", Basic Books; Reprint edition, 2002.

Reference Books:
1. Donald A. Norman, "The design of everyday things", Basic books.
2. Rogers Sharp Preece, "Interaction Design:Beyond Human Computer Interaction", Wiley.
3. Guy A. Boy "The Handbook of Human Machine Interaction", Ashgate publishing Ltd.

Laboratory Plan
Human Machine Interaction
(2018-19)

Sr. No.	Experiment	CO	Planned date	Actual Date
1	a. Children (4-5 years of age): An application to teach Math/English. b. Teenagers: Design a digital diary for young teens to help them overcome various social pressures they deal with during their teen years. The diary should also be like a self help tool which would help them deal with incidents like bullying, peer pressure, etc. This is an open project and you can think in any direction to make the children sail through their teen years while trying to discover life around them. c. Older generation: Folks from the older generation has been very wary of using their credit card on the Internet. They have various concerns when it comes to paying their bills. Also because of their old age, it will be beneficial for them to use the internet and pay their phone, electricity, gas, etc. bills d. Rural people: ATVM for train ticketing in rural area	1,4	3rd week of January	3rd week of January
2	Developing an interface for an application for Physically or visually challenged people	1,2,4	4th week of January	4th week of January
3	Design story boards from any two scenarios for any software system.	1	1st week of February	1st week of February
4	Redesign interfaces of home appliances like microwave oven, land-line phone, fully automatic washing machine.	1,3,4	3rd week of February	4th week of February
5	Identify 5 different websites catering to one specific goal (eg. Goal – on-line shopping and 5 different websites – ebay, amazon, flipkart, zovi, myntra) and perform a competitive analysis	1,3	4th week of February	4th week of February

	on them to understand how each one caters to the goal, the interactions and flow of the payment system and prepare a report on the same			
6	Website redesign: News websites like CNN are always cluttered with information. It takes the user a few minutes to find his way through and maybe more minutes to look for some specific information. Redesign the news websites to make it look less cluttered, provide relevant information (a person sitting in Russia should not get US news as top news), intelligently dig Information that he might be interested in based on his searches on the web.	1,3,4	1st Week of March	1st Week of March
7	Choose a unique domain, design a few icons and show how it can be accommodated on an interface	1	2nd week of March	2nd week of March
8	To study serial Positioning effect, Fitt's law and Webber's law. (Use IITs Virtual labs) (New)	1,2	3rd week of March	3rd week of March
9	Concept generation: Study the various technologies for typing – standard keyboards QWERTY, T9 (predictive text), multi-touch (SYWPE, etc.), gestures and brainstorm on the various ways in which you could improve one of the existing technologies. You could choose any of the different input types		4th Week of March	4th Week of March
10	To study advance topic in HMI that is not covered in syllabus and prepare a report for the same.	PO12	4th Week of March	1st Week of April
11	study one recent publication / technical paper in the field of HMI and present it in front of the class. This exercise will help inculcate lifelong learning in students.	PO12	1st week of April	4th week of March First week of April