

**GUJARAT TECHNOLOGICAL UNIVERSITY (GTU)****Competency-focused Outcome-based Green Curriculum-2021 (COGC-2021)**

Semester-III

**Course Title: Responsive Web Page Design**

(Course Code: 4330705)

Diploma programme in which this course is offered	Semester in which offered
Computer Engineering	Third

**1. RATIONALE**

In this technological era, different devices being used to view the online content and websites. While designing webpage, it is required to maintain visual consistency spanning all the platforms. Bootstrap is a free and open-source web development framework. Bootstrap is a sleek, intuitive, and powerful, mobile first front-end framework for faster and easier web development. It's designed to ease the web development process of responsive, mobile-first websites Bootstrap provide in build classes and files to make more fun in designing and give new look more and design. It is used to convert html page design into RWD (Responsive Web Design) which is easy to learn and have many designs related functionalities. It uses HTML, jQuery and JavaScript to provide cross platform web design solution.

## Course Objectives:

- Bootstrap CSS Contains global CSS classes for typography, tables, grids, forms, buttons, images etc.
- High built-in Support for layout, grids, fluid grids, and responsive and mobile first web designs.
- Bootstrap Components which contain various reusable components including Icons, Dropdowns, Navbars, Breadcrumbs, Popovers, Alerts, and many more.
- Various jQuery and JavaScript Plug-ins which added one by one in webpages to enhance user experience.

This course will give basic knowledge and skills for client-side web UI frameworks, in particular Bootstrap. You will learn about grids and responsive design, Bootstrap CSS and JavaScript components. Thus this course aims to help the developers to build the websites faster without worrying about the basic commands and functions.

**2. COMPETENCY**

The purpose of this course is to help the student to attain the following industry identified competency through Bootstrap Framework experiences:

- **Use Bootstrap Framework to build aesthetic responsive web pages that work uniformly in different devices (desktops, tablets and mobile) and operative platforms.**

### 3. COURSE OUTCOMES (COs)

The practical exercises, the underpinning knowledge and the relevant soft skills associated with the identified competency are to be developed in the student for the achievement of the following COs:

- Prepare environment for Bootstrap framework for first time use.
- Build different web pages layouts adhering to all platforms and sizes.
- Apply reusable bootstrap components to design effective user-friendly web pages.
- Develop interactive features rich web pages using Bootstrap jQuery plug-ins.

### 4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P/2)	Examination Scheme				
L	T	P		Theory Marks		Practical Marks		Total Marks
			C	CA	ESE	CA	ESE	
0	0	2	1	0	0	25	25	50

(\*): For this practical only course, 25 marks under the practical CA has two components i.e. the assessment of micro-project, which will be done out of 10 marks and the remaining 15 marks are for the assessment of practical. This is designed to facilitate attainment of COs holistically, as there is no theory ESE.

**Legends:** L-Lecture; T- Tutorial/Teacher Guided Theory Practice; P-Practical; C- Credit, CA - Continuous Assessment; ESE -End Semester Examination.

### 5. SUGGESTED PRACTICAL EXERCISES

The following practical outcomes (PrOs) are the sub-components of the COs. Some of the PrOs marked '\*\*' are compulsory, as they are crucial for that particular CO at the 'Precision Level' of Dave's Taxonomy related to 'Psychomotor Domain'.

S. No	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. required
1	Install Bootstrap framework and understand various tags, attributes of HTML and other necessary files to make responsive web page.	I	02*
2	Design web page that shows department name, college name at center of web page by using bootstrap framework and without using bootstrap framework.	I	01*
3	Display student information content on responsive web page by using container and container-fluid classes.	II	01*
4	Use offset column, reordering column and Nesting column to create responsive web page for given format.	II	01
5	Create responsive web page of your class time table by using	II	01*

S. No	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. required
	bootstrap grid system.		
6	Shows at least five to six co-curricular/Extra activities of student that includes multiple images and short description of each activity on responsive web page using responsive images with different styles and responsive tables with 3 to 4 different styles such as hover state when mouse over, different color of each row, table with striped row etc.	II	02*
7	Use bootstrap typography to create responsive web page on given blog topic.	II	01*
8	Design responsive web page for student registration form using bootstrap form layout, form control, bootstrap buttons.	II	01*
9	Create various types of menus using bootstrap menu components such as right aligned dropdown menu, drop up menu, adding headers of each item etc. and glyphicons components.	III	01
10	Design responsive web page that shows odd (sem1, sem3, sem5) and even (sem2, sem4, sem6) semester consider as menu, courses of each semester as submenu using button groups and button toolbar component.	III	01*
11	Use different bootstrap input groups components to create responsive webpage for job application or any other kind of application.	III	01*
12	Use Navigation tabs/Pills to create responsive web page for summarize of all individual units of any one course.	III	01*
13	Use Nav bar component to create responsive fixed to top menu design includes logo, menu, drop down menu, form input elements such as sign-up button, search mechanism etc. And fixed to bottom menu design contains footer information.	III	01*
14	Create responsive web page of education website using bootstrap breadcrumb, pagination, labels/badge, Jumbotron/page header, thumbnail components.	III	01
15	Following tasks to be performed using bootstrap progress bars component. A) Creating progress bars B) Adding label to progress bars C) Creating multi-color, stripped and animated progress bars D) Changing value of progress bar dynamically using JavaScript	III	01
16	Use media, rounded media, Nested media object to create responsive web page for all family members in hierarchical order.	III	01*

S. No	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. required
17	Create responsive webpage of various service provider information using bootstrap panel component, List group component, various alert messages and show message after bootstrap alert has been closed.	III	01
18	Design a smooth page transition between homepage, about and contact us page using bootstrap transition plugin.	IV	01*
19	Design a webpage with different modal dialog for "Save record confirmation", "Delete record confirmation" using model dialog plugin of bootstrap.	IV	01*
20	Design news story page to demonstrate usage of Scrollspy for multiple section, Tooltip for different photos, Collapsible and popover plugins of bootstrap.	IV	02*
21	Design animated photo gallery page using Carousel bootstrap plugin with minimum seven photos.	IV	01*
22	Develop advanced responsive website with minimum Five to seven pages on any of following domains (Tourism, Hospitality, Airline reservation, Medical, E commerce etc.)	IV	04*
	<b>Minimum 22 Practical Exercises</b>		<b>28 Hrs.</b>

**Note**

- i. More **Practical Exercises** can be designed and offered by the respective course teacher to develop the industry relevant skills/outcomes to match the COs. The above table is only a suggestive list.
- ii. The following are some **sample** 'Process' and 'Product' related skills (more may be added/deleted depending on the course) that occur in the above listed **Practical Exercises** of this course required which are embedded in the COs and ultimately the competency.

S.No.	Sample Performance Indicators for the PrOs	Weightage in %
1	Use of creative and innovative approach to implement practical.	15
2	Use bootstrap framework to build efficient responsive websites	15
3	Effective utilization of different components and plugins to design web pages more user friendly.	20
4	Verify practical implementation for desired output.	30
5	Interpret the result and conclude	20
	<b>Total</b>	<b>100</b>

**6. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED**

These major equipments with broad specifications for the PrOs is a guide to procure them by the administrators to usher in uniformity of practicals in all institutions across the state.

S. No.	Equipment Name with Broad Specifications	PrO. No.
1	Computer system with operating system and browser that supports JavaScript.	All
2	HTML IDEs and Code Editors Open-source tools like Visual Studio Code, Notepad++	All
3	Open-source jQuery and Bootstrap Framework	All

### 7. AFFECTIVE DOMAIN OUTCOMES

The following *sample* Affective Domain Outcomes (ADOs) are embedded in many of the above-mentioned COs and PrOs. More could be added to fulfil the development of this course competency.

- a) Work as a leader/a team member.
- b) Follow ethical practices.
- c) Practice environmentally friendly methods and processes.
- d) Follow safety precautions.

The ADOs are best developed through the laboratory/field-based exercises. Moreover, the level of achievement of the ADOs according to Krathwohl's 'Affective Domain Taxonomy' should gradually increase as planned below:

- i. 'Valuing Level' in 1<sup>st</sup> year
- ii. 'Organization Level' in 2<sup>nd</sup> year.
- iii. 'Characterization Level' in 3<sup>rd</sup> year.

### 8. UNDERPINNING THEORY

The major underpinning theory is given below based on the higher level UOs of Revised Bloom's taxonomy that are formulated for development of the COs and competency. If required, more such UOs could be included by the course teacher to focus on attainment of COs and competency.

Unit	Unit Outcomes (UOs) (4 to 6 UOs at different levels)	Topics and Sub-topics
<b>Unit – I: Introduction to jQuery and Bootstrap Framework</b>	1a. Understand basics of jQuery 1b. Discuss importance of Bootstrap framework. 1c. Setting up environment to use Bootstrap framework. 1d. Design first basic responsive page based on Mobile First Strategy.	1.1 Introduction to jQuery 1.2 Importance of jQuery, jQuery syntax, jQuery selectors, jQuery Events 1.3 Bootstrap Framework 1.4 Why Bootstrap? 1.5 History of Bootstrap 1.6 Advantages of Bootstrap Framework 1.7 Responsive web page 1.8 How to remove Responsiveness 1.9 Major Features of Bootstrap

Unit	Unit Outcomes (UOs) (4 to 6 UOs at different levels)	Topics and Sub-topics
		1.10 Mobile-First Strategy 1.11 Setting up Environment 1.12 How to apply Bootstrap to Applications
<b>Unit– II: Bootstrap Grid</b>	2a. Describe the mechanism of bootstrap grid structure. 2b. Design the web pages using bootstrap grid and structure the content in rows and columns format. 2c. Apply different form layout, buttons and text formatting while designing web pages. 2d. Use caret class in web page design.	2.1 Bootstrap Grid 2.2 Apply Bootstrap Grid, Container, Offset Column, Reordering Columns 2.3 Advantages of Bootstrap Grid 2.4 Display responsive Images 2.5 Bootstrap Typography, use Typography 2.6 Bootstrap Tables, Form Layout, Button 2.7 Display images in different styles like Circle shape etc. 2.8 Carets Classes, hide or show the text in Bootstrap
<b>Unit– III: Bootstrap Components</b>	3a. Discuss different bootstrap components. 3b. Use different bootstrap components like Glyphicons, Dropdown Menu Button Groups and Button Toolbar to effective page design. 3c. Design webpages using bootstrap card, Navigation Pills and Tab Components. 3d. Apply various input, navigation, progress and alerts related bootstrap components to make functionality rich web page.	3.1 Bootstrap Components, Advantages of Bootstrap Components, The different types of Bootstrap Components 3.2 Glyphicons Component, Use Glyphicons Component 3.3 Bootstrap Dropdown Menu Component 3.4 Bootstrap Card Component 3.5 Button Groups and Button Toolbar, Use Button Groups and Button Toolbar 3.6 Different Input Groups Components 3.7 Navigation Pills & Tabs Components, Use Navigation Pills and Tabs Components 3.8 Navbar Component, build a Responsive Navbar 3.9 Add Forms and other controls to Navbar, Fix the position of navbar 3.10 Breadcrumb Component 3.11 Pagination Component, apply Pagination in Application 3.12 Labels/Badge Components, Jumbotron/Page Header Components, Thumbnail Component 3.13 Alerts & Dismissible Alerts, How to Create Progress Bar, Media Objects Component 3.14 Bootstrap List Group Component,

Unit	Unit Outcomes (UOs) (4 to 6 UOs at different levels)	Topics and Sub-topics
		Bootstrap Panel Component
<b>Unit-IV: Bootstrap Plug-Ins</b>	4a. Understand importance of various bootstrap plug-ins 4b. Use different model dialog box give different popup windows, messages on dialog mode. 4c. Apply Scrollspy, Tooltip, popover plug-in, alert and button plug-ins while designing page to make it more interactive. 4d. Design home screen more attractive by using Carousel plug-in.	4.1 Why bootstrap plug-ins 4.2 Use of bootstrap plug-ins 4.3 Transition plug-in 4.4 Modal dialog box 4.5 The different properties, methods and events of model dialog box 4.6 Scrollspy plug-in, tab plug-in, use of tab plug-in, Drop Down plug-in 4.7 Tooltip plug-in, Use of Button plug-in, Methods and events of tooltip plug-in 4.8 popover plug-in, alert and button plug-ins 4.9 Collapse plug-in, different types of properties, methods and events of collapse plug-in 4.10 Carousel plug-in, affix plug-in

## 9. SUGGESTED SPECIFICATION TABLE FOR QUESTIONPAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Introduction to jQuery and Bootstrap Framework	3				
II	Bootstrap Grid	7				
III	Bootstrap Components	9				
IV	Bootstrap Plug-Ins	9				
<b>Total</b>		<b>28</b>				

**Legends:** R=Remember, U=Understand, A=Apply and above (Revised Bloom's taxonomy)

**Note:** This specification table provides general guidelines to assist students for their learning and to teachers to teach and question paper designers/setters to formulate test items/questions to assess the attainment of the UOs. The actual distribution of marks at different taxonomy levels (of R, U and A) in the question paper may slightly vary from above table.

## 10. SUGGESTED STUDENT ACTIVITIES

Other than the laboratory learning, following are the suggested student-related **co-curricular** activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should perform following activities in group and prepare reports of about 5 pages for each activity. They should also collect/record physical evidences for their (student's) portfolio which may be useful for their placement interviews:

- a) Identify tools used for web page development and present its features.
- b) Undertake course “HTML, CSS, and Javascript for Web Developers” available on courseraonline platform. (<https://www.coursera.org/learn/html-css-javascript-for-web-developers>).
- c) Undertake course “Front-End Web UI Frameworks and Tools: Bootstrap” available on coursera online platform. (<https://www.coursera.org/learn/bootstrap-4>) or any other such site.
- d) Undertake course “Bootstrap 5 From scratch with 13 Projects | 4 Sass Projects” available on Udemy online platform. (<https://www.udemy.com/course/learn-by-building-bootstrap-5-from-scratch-with-8-projects>) or any other such site.

#### 11. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

- a) Massive open online courses (**MOOCs**) may be used to teach various topics/sub topics.
- b) Guide student(s) in undertaking micro-projects.
- c) **‘P’ in section No. 4** means different types of instructions that are to be employed by teachers to develop the outcomes.
- d) About **20% of the topics/sub-topics** which are relatively simpler or descriptive in nature is to be given to the students for **self-learning**, but to be assessed using different assessment methods.
- e) With respect to **section No.10**, teachers need to ensure to create opportunities and provisions for **co-curricular activities**.
- f) Guide students for open-source HTML editors, components and plugins.
- g) Motivate students to visit as many websites as they can to increase the design knowledge and creativity.

#### 12. SUGGESTED MICRO-PROJECTS

**Only one micro-project** is planned to be undertaken by a student that needs to be assigned to him/her in the beginning of the semester. In the first four semesters, the micro-project are group-based (group of 3 to 5). However, **in the fifth and sixth semesters**, the number of students in the group should **not exceed three**.

The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. Each micro-project should encompass two or more COs which are in fact, an integration of PrOs, UOs and ADOs. Each student will have to maintain dated work diary consisting of individual contribution in the project work and give a seminar presentation of it before submission. The duration of the microproject should be about **12-14 (twelve to fourteen) student engagement hours** during the course. The students ought to submit micro-project by the end of the semester to develop the industry-oriented COs.

A suggestive list of micro-projects is given here. This has to match the competency and the COs. Similar micro-projects could be added by the concerned course teacher:

- a) Design mobile first responsive departmental website



- b) Develop any domain specific responsive website (Food, Automobiles, Educational, Business etc.)
- c) Develop a responsive website for NGO or society working to save environment to make awareness towards environment to save soil, water, trees and other major resources of our environment.

### 13. SUGGESTED LEARNING RESOURCES

S. No.	Title of Book	Author	Publication with place, year and ISBN
1	Bootstrap	Jake Spurlock	O'Reilly Media, Inc. ISBN: 9781449343910
2	Bootstrap Reference Guide	Jacob Lett	Bootstrap Creative. ISBN:1732205833
3	Bootstrap 4 Cookbook	AjdinImsirovic	Packt Publishing Limited. ISBN:178588929X
4	Mastering Bootstrap 4 - Second Edition	Benjamin Jakobus	Packt Publishing Limited. ISBN:1788834909
5	Bootstrap 4 By Example	Silvio Moreto	Packt Publishing Limited ISBN:1785288873
6	HTML & CSS: The Complete Reference	Thomas Powell	Tata McGraw Hills, New Delhi, ISBN: 9780070701946

### 14. SOFTWARE/LEARNING WEBSITES

- <https://www.geeksforgeeks.org/bootstrap/>
- <https://www.getbootstrap.com>
- <https://www.w3schools.com/bootstrap/>
- <https://www.websitesetup.org/bootstrap-tutorial-for-beginners/>
- <https://www.tutorialrepublic.com/twitter-bootstrap-tutorial/>
- <https://www.tutorialspoint.com/bootstrap/index.htm>
- [12 Awesome CSS3 Features That You Can Finally Start Using - Tutorialzine](#)
- [Twitter Bootstrap Tutorial for Beginners \(ieatcss.com\)](#)
- [CSS3 - Tutorial \(tutorialspoint.com\)](#)
- [CSS3 Tutorial - An Ultimate Guide for Beginners \(tutorialrepublic.com\)](#)

### 15. PO-COMPETENCY-CO MAPPING

Semester III	Responsive Web Page Design (Course Code: 4330705)						
	POs						
Competency & Course Outcomes	PO 1 Basic & Discipline specific	PO 2 Problem Analysis	PO 3 Design/development	PO 4 Engineering Tools, Experiment-	PO 5 Engineering practices for society	PO 6 Project Management	PO 7 Life-long

	knowledge		t of solutions	tation&Testing	sustainability & environment		learning
<b>Competency</b>	<b>Use Advanced CSS and Bootstrap Framework to build aesthetic responsive web pages that work uniformly in different devices (desktops, tablets and mobile) and operative systems.</b>						
<b>Course Outcomes</b>							
CO a) Prepare environment for Bootstrap framework for first time use.	2	-	-	1	-	-	-
CO b) Build different webpages layouts adhering to all platforms and sizes.	2	1	1	1	-	-	1
CO c) Apply reusable bootstrap components to design effective user-friendly web pages.	2	2	2	2	1	-	1
CO d) Develop interactive features rich web pages using Bootstrap jQuery plug-ins.	2	1	1	2	1	1	1

Legend: '3' for high, '2' for medium, '1' for low and '-' for no correlation of each CO with PO.

## 16. COURSE CURRICULUM DEVELOPMENT COMMITTEE

### GTU Resource Persons

Sr. No.	Name and Designation	Institute	Contact No.	Email
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