

Program Name : Computer Engineering Program Group / Diploma in Artificial Intelligence and Machine Learning / Diploma in Cloud Computing and Big Data / Diploma in Computer Hardware & Maintenance

Program Code : CO/CM/IF/CW/AN/BD/HA

Semester : Fifth

Course Title : Client Side Scripting Language

Course Code : 22519

1. RATIONALE

JavaScript is limited featured client side programming language. JavaScript runs at the client end through the user's browser without sending messages back and forth to the server. It is widely used by the web developers to do things such as build dynamic web pages, respond to events, create interactive forms, validate data that the visitor enters into a form, control the browser etc. This course helps student to create highly interactive web pages using these features.

2. COMPETENCY

The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences

- Develop Dynamic Web Pages using JavaScript.

3. COURSE OUTCOMES (COs)

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following *industry oriented* COs associated with the above mentioned competency:

- Create interactive web pages using program flow control structure.
- Implement Arrays and functions in Java script.
- Create event based web forms using Java script.
- Use JavaScript for handling cookies.
- Create interactive webpage using regular expressions for validations.
- Create Menus and navigations in web Pages.

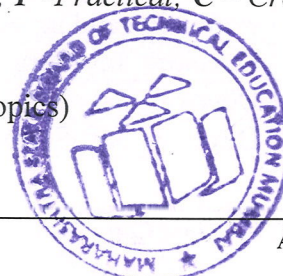
4. TEACHING AND EXAMINATION SCHEME

| Teaching Scheme | | | Credit (L+T+P) | Examination Scheme | | | | | | | | | | | | |
|-----------------|---|---|----------------|--------------------|-----|-----|-----|-----|-------|-----------|-----|-----|-----|-----|-------|-----|
| L | T | P | | Theory | | | | | | Practical | | | | | | |
| | | | | Paper Hrs. | ESE | | PA | | Total | | ESE | | PA | | Total | |
| | | | | | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min |
| 3 | - | 2 | 5 | 3 | 70 | 28 | 30* | 00 | 100 | 40 | 25# | 10 | 25 | 10 | 50 | 20 |

(*): Under the theory PA, Out of 30 marks, 10 marks are for micro-project assessment to facilitate integration of COs and the remaining 20 marks is the average of 2 tests to be taken during the semester for the assessment of the UOs required for the attainment of the COs.

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

5. COURSE MAP(with sample COs, PrOs, UOs, ADOs and topics)



This course map illustrates an overview of the flow and linkages of the topics at various levels of outcomes (details in subsequent sections) to be attained by the student by the end of the course, in all domains of learning in terms of the industry/employer identified competency depicted at the centre of this map.

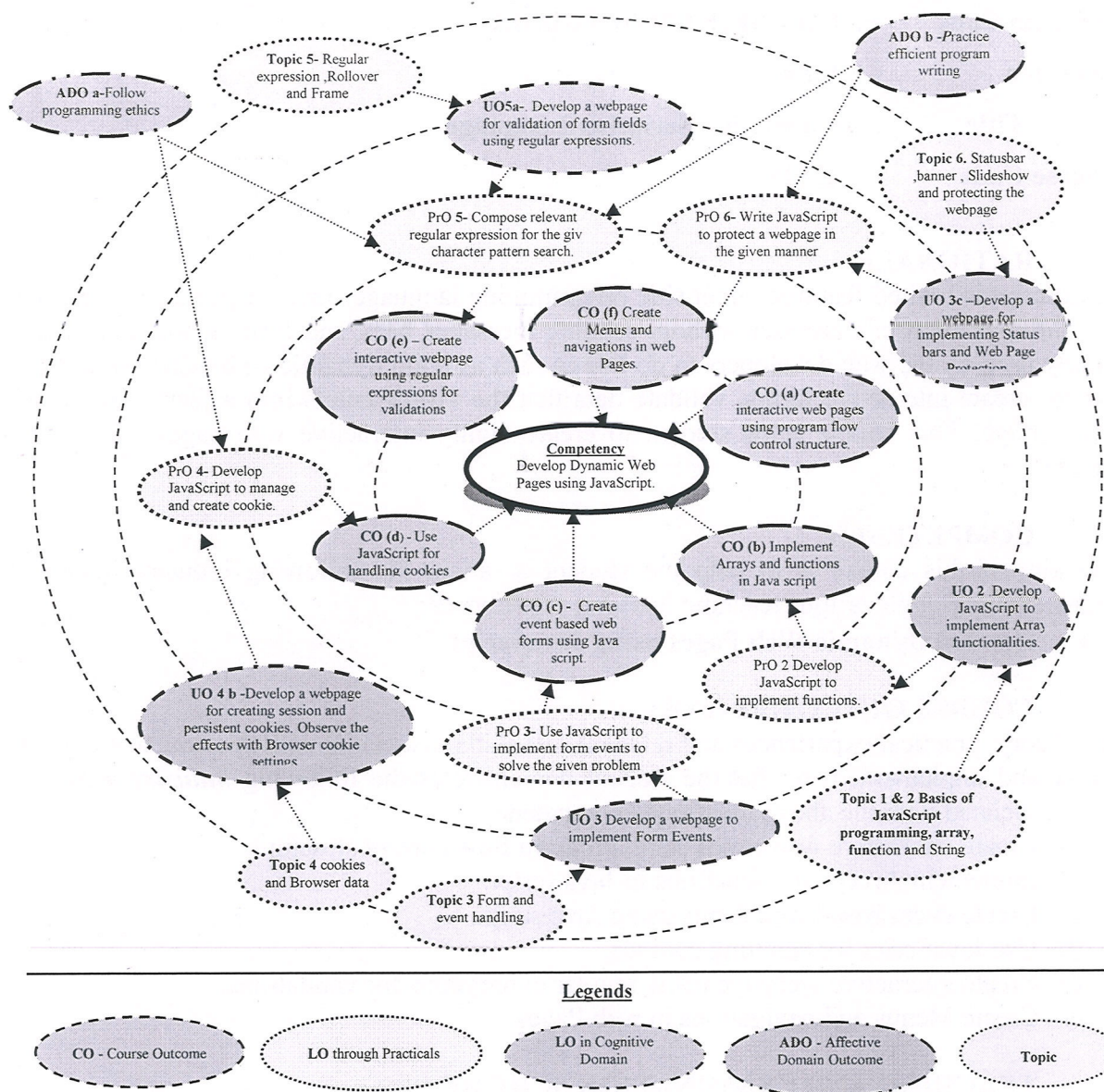


Figure 1 - Course Map

6. SUGGESTED PRACTICALS/ EXERCISES

The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency.

| Sr. No. | Practical Outcomes (PrOs) | Unit No. | Approx. Hrs. Required |
|---------|---|----------|-----------------------|
| 1. | Write simple javascript with HTML for arithmetic expression evaluation and message printing | I | 02 |
| 2. | Develop JavaScript to use decision making and looping statements. | I | 02* |
| 3. | Develop JavaScript to implement Array functionalities. | II | 02* |
| 4. | Develop JavaScript to implement functions. | II | 02* |

| Sr. No. | Practical Outcomes (PrOs) | Unit No. | Approx. Hrs. Required |
|--------------|--|----------|-----------------------|
| 5. | Develop JavaScript to implement strings. | II | 02 |
| 6. | Create a webpage using Form Elements. | III | 02* |
| 7. | Create a webpage to implement Form Events. Part-I | III | 02* |
| 8. | Create a webpage to implement Form Events. Part-II | III | 02* |
| 9. | Develop a webpage using Intrinsic Java Functions. | III | 02* |
| 10. | Develop a webpage for creating session and persistent cookies. Observe the effects with Browser cookie settings. | IV | 02* |
| 11. | Develop a webpage for placing the Window on the screen and working with child window. | IV | 02* |
| 12. | Develop a webpage for validation of form fields using regular expressions. | V | 02* |
| 13. | Create a webpage with Rollovers effect. | VI | 02 |
| 14. | Develop a webpage for implementing Menus. | VI | 02* |
| 15. | Develop a webpage for implementing Status bars and Web Page Protection. | VI | 02 |
| 16. | Develop a webpage for implementing Slideshow, banner. | VI | 02* |
| Total | | | 32 |

Note:

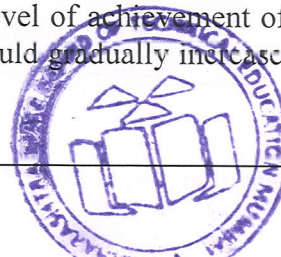
- A suggestive list of PrOs is given in the above table. More such PrOs can be added to attain the COs and competency. A judicious mix of minimum 12 or more practical need to be performed, out of which, the practicals marked as '*' are compulsory, so that the student reaches the 'Application Level' of Bloom's Taxonomy' as generally required by the industry.
- 50% of Lab assignments must be done using traditional editor and run in different browsers so as to build up fundamental understanding capabilities of students.
- The 'Process' and 'Product' related skills associated with each PrO are to be assessed according to a suggested sample given below:

| S. No. | Performance Indicators | Weightage in % |
|--------------|---------------------------------------|----------------|
| 1 | Use of relevant tags and attributes | 10 |
| 2 | Correctness of Coding. | 40 |
| 4 | Testing and Debugging of the Program. | 30 |
| 5 | Appearance of Program Output. | 10 |
| 6 | Submission of report in time. | 10 |
| Total | | 100 |

The above PrOs also comprise of the following social skills/attitudes which are Affective Domain Outcomes (ADOs) that are best developed through the laboratory/field based experiences:

- Follow safety practices.
- Practice good housekeeping.
- Demonstrate working as a leader/a team member.
- Follow ethical practices.

The ADOs are not specific to any one PrO, but are embedded in many PrOs. Hence, the acquisition of the ADOs takes place gradually in the student when s/he undertakes a series of practical experiences over a period of time. Moreover, the level of achievement of the ADOs according to Krathwohl's 'Affective Domain Taxonomy' should gradually increase as planned below:



- 'Valuing Level' in 1st year
- 'Organising Level' in 2nd year
- 'Characterising Level' in 3rd year.

7. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

The major equipment with broad specification mentioned here will usher in uniformity in conduct of experiments, as well as aid to procure equipment by authorities concerned.

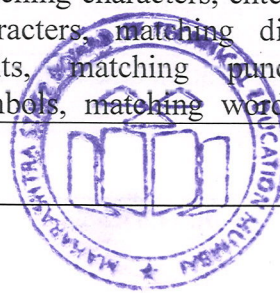
| S. No. | Equipment Name with Broad Specifications | PrO. S.No. |
|--------|--|------------|
| 1 | Browser and Notepad/any Text editor/ | All |
| 2 | Free Web page Designing Tool | All |
| 3 | Any IDE like Eclipse | All |

8. UNDERPINNING THEORY COMPONENTS

The following topics are to be taught and assessed in order to develop the sample UOs given below for achieving the COs to attain the identified competency. More UOs could be added.

| Unit | Unit Outcomes (UOs) (in cognitive domain) | Topics and Sub-topics |
|---|---|---|
| Unit – I Basics of JavaScript Programmi ng | 1a. Create object to solve the given problem. 1b. Develop JavaScript to implement the switch-case statement for the given problem. 1c. Develop JavaScript to implement loop for solving the given iterative problem. 1d. Display properties of the given object using getters and setters. 1e. Develop program using basic features of JavaScript to solve the given problem. | 1.1 Features of JavaScript 1.2 Object Name, Property, method, Dot syntax, main event. 1.3 Values and Variables 1.4 Operators and Expressions- Primary Expressions, Object and Array initializers, function definition expression, property access expressions, invocation expressions. 1.5 If Statement, if...else, if..elseif, nested if statement. 1.6 Switch...case statement 1.7 Loop statement – for loop, for...in loop, while loop, do...while loop, continue statement. 1.8 Querying and setting properties and deleting properties, property getters and setters. |
| Unit-II Array, Function and String | 2a. Create array to solve the given problem. 2b. Perform the specified string manipulation operation on the given String(s). 2c. Develop JavaScript to implement the given function. 2d. Develop JavaScript to convert the given Unicode to character form. 2e. Develop JavaScript to convert the given character | 2.1 Array - declaring an Array, Initializing an Array, defining an Array elements, Looping an Array, Adding an Array element, sorting an Array element, Combining an Array elements into a String, changing elements of an Array, Objects as associative Arrays 2.2 Function – defining a function, writing a function, adding an arguments, scope of variable and arguments, 2.3 Calling a function – calling a function with or without an argument, calling function from HTML, function calling |

| Unit | Unit Outcomes (UOs) (in cognitive domain) | Topics and Sub-topics |
|--|--|---|
| | to Unicode and vice-versa. | another function. Returning a value from a function 2.4 String – manipulate a string, joining a string, retrieving a character from given position, retrieving a position of character in a string, dividing text, copying a sub string, converting string to number and numbers to string, changing the case of string, finding a Unicode of a character-charCodeAt(), fromCharCode(). |
| Unit– III Form and Event Handling | 3a. Write JavaScript to design a form to accept input values for the given problem. 3b. Use JavaScript to implement form events to solve the given problem. 3c. Develop JavaScript to dynamically assign specified attribute value to the given form control. 3d. Use the given intrinsic function with specified parameters. | 3.1 Building blocks of a Form, properties and methods of form, button, text, text area, checkbox, radio button, select element. 3.2 Form events- mouse event, key events. 3.3 Form objects and elements. 3.4 Changing attribute value dynamically. 3.5 Changing option list dynamically 3.6 Evaluating checkbox selection 3.7 Changing a label dynamically 3.8 Manipulating form elements 3.9 Intrinsic JavaScript functions, disabling elements, read only elements. |
| Unit– IV Cookies and Browser Data | 4a. Create cookies based on the given problem. 4b. Develop JavaScript to manage a cookie in the given manner. 4c. Write JavaScript to manipulate the specified attributes of window object in the given manner. 4d. Write JavaScript to create browser history of the given object. | 4.1 Cookies – basic of cookies, reading a cookie value, writing a cookie value, creating a cookies, deleting a cookies, setting the expiration date of cookie 4.2 Browser – opening a window, giving the new window focus, window position, changing the content of window, closing a window, scrolling a web page, multiple windows at once, creating a web page in new window, JavaScript in URLs, JavaScript security, Timers, Browser location and history. |
| Unit –V Regular Expression, Rollover and Frames | 5a. Compose relevant regular expression for the given character pattern search. 5b. Develop JavaScript to implement validations using the given regular expression. | 5.1 Regular Expression - language of regular expression, finding non matching characters, entering a range of characters, matching digits and non digits, matching punctuations and symbols, matching words, replacing a |



| Unit | Unit Outcomes (UOs) (in cognitive domain) | Topics and Sub-topics |
|---|--|--|
| | 5c. Create frames based on the given problem. 5d. Create window object as per the given problem. 5e. Develop JavaScript for creating rollover effect for the given situation. | the text using regular expressions, returning the matched characters, regular expression object properties. 5.2 Frames – create a frame, invisible borders of frame, calling a child windows, changing a content and focus of a child window, writing to a child window, accessing elements of another child window. 5.3 Rollover – creating rollover, text rollover, Multiple actions for rollover, more efficient rollover. |
| Unit –VI Menus, navigation and web page protection | 6a. Develop JavaScript to manage the given status bar. 6b. Develop JavaScript to create the given banner. 6c. Develop JavaScript to create the given slide show. 6d. Develop JavaScript to create the given Menu. 6e. Write JavaScript to protect a webpage in the specified manner. | 6.1 Status bar- builds a static message, changing the message using rollover, moving the message along the status bar 6.2 Banner –loading and displaying banner advertisement. Linking a banner advertisement to url 6.3 Slide Show – creating a slide show 6.4 Menus- creating a pulldown menu, dynamically changing a menu, validating menu selection, Floating menu, chain select menu, tab menu, pop-up menu, sliding menu, highlighted menu, folding a tree menu, context menu, scrollable menu, side bar menu. 6.5 Protecting web page – hiding your code, disabling the right mouse button, JavaScript, concealing email address. 6.6 Frameworks of javascript and its application |

Note: To attain the COs and competency, above listed UOs need to be undertaken to achieve the 'Application Level' of Bloom's 'Cognitive Domain Taxonomy'

9. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

| Unit No. | Unit Title | Teaching Hours | Distribution of Theory Marks | | | |
|----------|---|----------------|------------------------------|---------|---------|-------------|
| | | | R Level | U Level | A Level | Total Marks |
| I | Basics of JavaScript Programming | 10 | 04 | 04 | 04 | 12 |
| II | Array, Function and String | 10 | 02 | 04 | 08 | 14 |
| III | Form and Event Handling | 06 | 02 | 04 | 04 | 10 |
| IV | Cookies and Browser Data | 06 | 02 | 02 | 04 | 08 |
| V | Regular Expression, Rollover & Frames | 08 | 02 | 06 | 06 | 14 |
| VI | Menus, navigation and web page protection | 08 | 02 | 04 | 06 | 12 |

| Unit No. | Unit Title | Teaching Hours | Distribution of Theory Marks | | | |
|----------|------------|----------------|------------------------------|---------|---------|-------------|
| | | | R Level | U Level | A Level | Total Marks |
| Total | | 48 | 14 | 24 | 32 | 70 |

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

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

10. SUGGESTED STUDENT ACTIVITIES

Other than the classroom and 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:

- Prepare journals based on practical performed in laboratory.
- Prepare powerpoint presentation or animation for understanding different Client side scripting Concepts.

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:

- Massive open online courses (**MOOCs**) may be used to teach various topics/sub topics.
- 'L' in item No. 4 does not mean only the traditional lecture method, but different types of teaching methods and media that are to be employed to develop the outcomes.
- About **15-20% of the topics/sub-topics** which is relatively simpler or descriptive in nature is to be given to the students for **self-directed learning** and assess the development of the COs through classroom presentations (see implementation guideline for details).
- With respect to item No.10, teachers need to ensure to create opportunities and provisions for **co-curricular activities**.
- Use different Audio Visual materials for Concept understanding.
- Guide student(s) in undertaking micro-projects.
- Encourage students to refer different websites to have deeper understanding of the subject.
- Observe continuously and monitor the performance of students in Lab.
- 50% of Lab assignments must be done using traditional editor and run in different browsers so as to build up fundamental understanding capabilities of students.

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. However, in the fifth and sixth semesters, it should be preferably be **individually** undertaken to build up the skill and confidence in every student to become problem solver so that s/he contributes to the projects of the industry. In special situations where groups have to be formed for micro-projects, 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 total duration of the micro-project should not be less than **16 (sixteen) student engagement hours** during the course. The student 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. Similar micro-projects could be added by the concerned faculty:

- Create a web page that displays buyers information entry form containing name, address, city, pin code, mail Id, Phone Number, product details , payment mode. Frame different validation rules for user inputs. Use JavaScript and regular expressions to perform error checking on user input as per validation rules.
- Build a simple slide show in JavaScript with six unique images. Design appropriate web page with at least two sections: with slide show in one section. When any image on this slide show is clicked display information about it in other section. Use features for controlling window locations.
- Design and create web pages of an institute with different sections. Use pulldown menus in one section and implement validation of menu selections. Use other sections for displaying information about respective selected menu item.
- Create a simple animation in JavaScript : create a basic page showing circle of white marble. Using the setTimeout() method create an animation on the page that that makes an orange marble rotate around this circle by moving the orange marble to the next location in the circle every second. Allow the user to stop the animation by placing the cursor on any marble(use clearTimeout()).

13. SUGGESTED LEARNING RESOURCES

| S. No. | Title of Book | Author | Publication |
|--------|---|------------------------------------|---|
| 1. | JavaScript Demystified | Keogh, Jim | McGraw-Hill, 2015, New Delhi ISBN:0-07-060347-2 |
| 2. | Beginning JavaScript | Wilton, Paul | Wily India, New Delhi, 2015, ISBN:0-7645-5587-1 |
| 3. | Beginning JavaScript | McPeak, Jeremy and Wilton, Paul | Wily India, New Delhi, 2015, ISBN:81-265-1304-7 |
| 4. | JavaScript in 24 hours (SAMS teach yourself) | Moncur, Michael | TechMedia, New Delhi, 2015, ISBN:978-0-672-33608-9 |

14. SOFTWARE/LEARNING WEBSITES

- <https://www.w3schools.com>
- <http://www.nptelvideos.com>
- <http://www.tutorialspoint.com>.
- <Http://javapoint.com>

