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**UNIVERSITY OF PETROLEUM & ENERGY STUDIES**

**College of Engineering Studies**

**Dehradun**

**COURSE PLAN**

Programme : B.Tech (CSE) with spl in Graphics and Gaming

Course : Web Programming for Graphics and Gaming(HTML5 & WebGL) Lab

Subject Code : CSEG339

No. of credits : 1

Semester : V

Session : 2017-18

Batch : 2015-19

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P.O. Bidholi, , Dehradun

**COURSE PLAN**

1. **PREREQUISITE:**
   1. Basic Knowledge of Mathematics like Matrix and Geometry.
   2. Good knowledge of any programming language like C or C++.
   3. Basic of any web programming script like HTML, CSS and Java Script.
2. **PROGRAM OUTCOMES (POs) and PROGRAM SPECIFIC OUTCOMES (PSOs) for ADE:**

**B1. PROGRAM OUTCOMES (POs)**

PO1: Apply knowledge of mathematics and Sciences in Computer Engineering and Information Technology.

PO2: Understand the impact of Computer Science and Engineering and Information Technology over global economics, environment and social structure to cater the needs of the society.

PO3: Understand the importance of team work with professional and ethical responsibilities.

PO4: Communicate effectively in various forms useful during all professional activities.

PO5: Implement, and evaluate computer-based systems, processes, components, or programs to meet the desired goal of the business/research domains.

PO6: Develop software by analyzing a problem to identify and define its computational requirements.

PO7: Acquire new technologies for individual and professional development.

PO8: Use current techniques, skills, and tools necessary for computing practices and to solve Engineering problems for the furtherance of the various application domains.

PO9: Apply design and development principles in the development of software systems of varying complexity.

PO10:

PO11:

PO12:

**B2. Program Specific Outcomes (PSOs)**

PSO1. Apply the tools and algorithms of graphics to design games and animations on digital systems.

PSO2. Apply the tools and algorithms for retrieval, modification and restoring of images on digital systems.

PSO3. Apply the principles of computing to graphics and game development.

1. **COURSE OUTCOMES FOR AUTOMOTIVE TRANSMISSION SYSTEMS: At the end of this course student should be able to**

CO1. Able to design a web page with HTML5 features.

CO2. Able to design a minimal website with HTML5 and Javascript.

CO3. Have practical understanding of the working of WebGL API.

CO4. Able to develop interactive 2D and 3D graphics applications using WebGL.

CO5. Able to apply realistic effects to graphic web content with WebGL.

**Table: Correlation of POs and PSOs v/s COs**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PO/CO | PO  1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO  9 | PO  10 | PO  11 | PO  12 | PSO  1 | PSO  2 | PSO  3 |
| CO1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CO2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CO3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CO4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

1. **OUTLINE OF PRACTICALS**

|  |
| --- |
| **Experiment 1: Introduction to HTML5** |
| **Experiment 2: HTML5 Forms** |
| **Experiment 3: HTML5 Canvas** |
| **Experiment 4: Introduction and Background WebGL** |
| **Experiment 5: Transformation and Viewing in WebGL** |

1. **PEDAGOGY**
2. **Students need to maintain a practical file which will contain all the executed experiments; file should contain all the output of all experiments, students will be evaluated on the basis of that file.**
3. **Student should carry mini lab copy which contains discussion of teachers note or algorithms of the experiments which will be executed.**
4. **COURSE COMPLETION PLAN**

|  |  |
| --- | --- |
| **Total Lab sessions** | 12 |

One Session =120 minutes

1. **EVALUATION & GRADING**

**Continuous Evaluation-** The performance of a student in a Practical subject will be evaluated as per process given below:

1. Components of evaluation
   1. Viva voce / Quiz (50%) + Performance & Records (50%).
   2. Lab performance and record evaluation shall be a continuous process throughout the semester.
   3. Minimum three Viva voce/ Quiz based on practical sessions shall be conducted during the semester.
2. Distribution of marks for the lab sessions and the methodology should be conveyed to the students at the time of commencement of semester.
3. Final Grade Award Sheet needs to be submitted to SRE department before completion of End semester examination.
4. **DETAILED LAB EXERCISE PLAN**

**EXPERIMENT NO – 01**

**TITLE: Introduction to HTML5**

**Objective: Introduction to HTML5 and CSS**

**1. Create a static webpage with information about your personnel details**

**2. Modify the web page created in 1, adding HTML5 features like nav, footer, header tags**

**3. Modify the web page created in 2, separating all the styling related information in a separate CSS file**

**4. Modify the above web page created in 3, adding video and audio files**

**EXPERIMENT NO – 02**

**TITLE: HTML5 Forms**

**Objective: Creating a working website**

**1. Create a sign up registration page, asking the necessary details from the user. Consider the case of a college website and the students as the users.**

**2. For the page created in 1, add a login page and a JavaScript validating the required user’s login**

**3. For the page created in 2, the user should go to personnel info. Page created in 1.4. Also add new features like session timeout using HTML5 web storage feature**

**EXPERIMENT NO – 3**

**TITLE: HTML5 Canvas**

**Objective :- Adding graphical elements to a website**

**1. Add a canvas to a web page and draw geometrical objects like circle, ellipse over it**

**2. Modify 1 and add user interface for the user to create any geometrical objects.**

**3. Link the web page created in 2 to the web page created in 3.3 and also add user defined color, curves and other drawing object to the page.**

**EXPERIMENT NO – 4**

**TITLE: Introduction and Background WebGL**

**Objective: - Understanding the basics of WebGL**

**1. Write a simple WebGL code displaying circle, triangle and rectangle**

**2. Modify program 1 and add user inputs for creating different size of circle, triangle and rectangle**

**3. Write a simple WebGL code allowing user to create a freehand polygon**

**4. Modify code of 3 and add the options of changing pencil color, size, background and choosing pre-defined shapes like circle, rectangle and ellipse**

**5. Write a WebGL program for the demo of working of Bresenham Line drawing algorithm. Take any pre-defined line end points and display the line generation step by step with screen divided into grids.**

**EXPERIMENT NO – 5**

**TITLE: Transformation and Viewing in WebGL**

**Objective: - Able to draw and animate 3-D objects and add realistic effects**

**1. Write a WebGL program to display a rotating cuboid coloring every surface with different colors**

**2. For program of 1, add the control of rotation, scaling and translation to the user**

**3. For program of 2, add the texture to any surface of the cuboid with user defined images stored in local repository**

**4. Write a WebGL program displaying ‘n’ number of bouncing balls with ‘n’ given by the user. The program should include 3 D projection and hidden surface removal effects.**

**5. Add a light source to program of 5.4 with the type of light model, location defined by the user.**

**6. Add a realistic FOG effect to program 5.5**

**7. Write a WebGL program virtualizing any real world environment like University’s Computer Lab, library room, classroom.**

Suggestive reads:

**H1. TEXT BOOK:**

1. WebGL Beginner's Guide by Diego Cantor, Packt Publishing Limited 18 May 2012
2. HTML & CSS: The Complete Reference, by Thomas Powell, McGraw Hill Education Fifth Edition1 July 2017

**H2. REFERRENCE BOOKS:**

1. WebGL programming guide : Interactive 3D Graphics Programming with WebGL by Kouichi Matsuda, Addison Wesley, 9 July 2013

2. OpenGL Programming Guide: The Official Guide to Learning OpenGL by Dave Shreiner, Version 4.3 Addison Wesley, 20 Mar 2013

3. OpenGL Shading Language (3rd Edition) 3rd Edition Addison-Wesley by Randi J. Rost, (July 30, 2009)

**GUIDELINES**

***Cell Phones and other Electronic Communication Devices*:** Cell phones and other electronic communication devices (such as Blackberries/Laptops) are not permitted in classes during Tests or the Mid/Final Examination. Such devices MUST be turned off in the class room.

***E-Mail and online learning tool:*** Each student in the class should have an e-mail id and a pass word to access the LMS system regularly. Regularly, important information – Date of conducting class tests, guest lectures, via online learning tool. The best way to arrange meetings with us or ask specific questions is by email and prior appointment. All the assignments preferably should be uploaded on online learning tool. Various research papers/reference material will be mailed/uploaded on online learning platform time to time.

***Attendance:*** Students are required to have **minimum attendance of 75%** in each subject. Students with less than said percentage shall **NOT** be allowed to appear in the end semester examination.

**Course outcome assessment:** To assess the fulfilment of course outcomes two different approaches have been decided. Degree of fulfillment of course outcomes will be assessed in different ways through direct assessment and indirect assessment. In Direct Assessment, it is measured through quizzes, tests, assignment, Mid-term and/or End-term examinations. It is suggested that each examination is designed in such a way that it can address one or two outcomes (depending upon the course completion). Indirect assessment is done through the student survey which needs to be designed by the faculty (sample format is given below) and it shall be conducted towards the end of course completion. The evaluation of the achievement of the Course Outcomes shall be done by analyzing the inputs received through Direct and Indirect Assessments and then corrective actions suggested for further improvement.

***Passing criterion:*** Student has to secure minimum 40% marks of the “highest marks in the class scored by a student in that subject (in that class/group class)” individually in both the ‘End-Semester examination’ and ‘Total Marks’ in order to pass in that paper.

* Passing Criterion for B. Tech: minimum 40% of the highest marks in the class

**Sample format for Indirect Assessment of Course outcomes**

|  |
| --- |
| NAME: |
| ENROLLMENT NO: |
| SAP ID: |
| COURSE: |
| PROGRAM: |

Please rate the following aspects of course outcomes of computer graphics.

Use the scale 1-4\*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sl. No. |  | 1 | 2 | 3 | 4 |
| 1 | CO1. Able to design a web page with HTML5 features. |  |  |  |  |
| 2 | CO2. Able to design a minimal website with HTML5 and Javascript. |  |  |  |  |
| 3 | CO3. Have practical understanding of the working of WebGL API. |  |  |  |  |
| 4 | CO4. Able to develop interactive 2D and 3D graphics applications using WebGL. |  |  |  |  |
| 5 | CO5. Able to apply realistic effects to graphic web content with WebGL. |  |  |  |  |

3

Below Average

Good

1

**\***

Very Good

Average

4

2