**Lesson Plan**

**Subject: Computer Graphics and Visualization on(22AEC473)**

**Department: CSE**

**Semester: IV**

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| MODULE 1: | | Suggested Reading materials/links:  Textbooks: Computer Graphics with OpenGL Hearn Baker,4th Edition **(Chapter1,2,3)**  Online Materials: https://ebooks.lpude.in/computer\_application/mca/term\_3/DCAP504\_COMPUTER\_GRAPHICS.pdf **(Chapter1)** | | | | | | |
| Target Lecture Hours: 2 | |
| Target Practical: 6 | |
| Sl. No. | Date | Topics to be covered. | No. of hours require | Cos | Blooms level | Actual date of Completion | Mode of teaching  (board/  presentation, etc.) | Remarks |
| 1 | 01/04/24 | **Introduction to the subject and course outcomes**  Basic concepts on 2D and 3D Environment with Input/output Devices . |  | CO1 | 1,2 |  | Board /PPT |  |
| 2 | 01/04/24 | Installation of Glut32 graphics Environment  Explanation of Program with Example to create 2D and 3D objects | 1 | CO1 | 1,2 |  | Board /PPT |  |
| 3 | 01/04/24 | Implementation of Program with Example to create 2D objects | 1 | CO1 | 1,3 |  | Program execution using systems |  |
| 4 | 08/04/24 | Implementation of Program with Example to create 3D objects | 1 | CO1 | 1 |  |  |  |
| 5 | 08/04/24 | Display File Structure, Display control text. Lists | 1 | CO1 | 2 |  | Board /PPT |  |
| 6 | 08/11/24 | Explanation of Program to reshape window | 1 | CO1 | 3 |  | Board /PPT |  |
| **Planned Module 1,2,3 assessment date:22/04/24**  Type of assessment: Test, quiz CO1, CO2,CO3 covered and BL 2,BL3  Actual Date of completion:  Total Strength of the class:73  Number of students attaining above 60% of the assessment marks: | | | | | | | | |
| MODULE 2: | | Textbooks: Computer Graphics with OpenGL Hearn Baker,4th Edition **(Chapter 10.11.13)**  Online Materials: https://cse.iitkgp.ac.in/~pb/pb-graphics-2018.pdf | | | | | | |
| Target Lecture Hours: 2 | |
| Target Practical: 6 | |
| 1 | 15/04/24 | Implementation of Program window reshape function.  Transformations: Matrices transformation, transformation routines, displays procedure. Three Dimension: 3-D  geometry primitives, transformations, projection clipping | 1 | CO2,CO3 | 2 |  | Board /PPT |  |
| 2 | 15/04/24 | Explanation of Program with Example to create 2D image and rotate translate, scale | 1 | CO2,CO5 | 3 |  | Board /PPT |  |
| 3 | 15/04/24 | **Project problem statements discussion** | 1 | CO2, CO3,CO4,CO5 | 1,2 |  | using systems |  |
| 4 | 22/04/24 | Explanation of algorithm draw circles and ellipse using algorithms. |  | CO2 |  |  |  |  |
| 5 | 22/04/24 | Implementation of algorithm draw circles and ellipse using algorithms. | 1 | CO2 | 2 |  | Board /PPT |  |
| **Planned Module 1,2,3 assessment date:22/04/24**  Type of assessment: Test, quiz CO1, CO2,CO3 covered and BL 2,BL3  Actual Date of completion:  Total Strength of the class:73  Number of students attaining above 60% of the assessment marks:  Project problem statement discussion and analysis 22/04/24 | | | | | | | | |
| MODULE 3: | | David Forsyth and Jean Ponce , Computer Vision: A Modern Approach, Second Edition*,* [Pearson Education](https://www.google.co.in/search?hl=en&q=inpublisher:%22Pearson+Education%22&tbm=bks&sa=X&ved=2ahUKEwixmsix-auAAxWs1DgGHc_gB4gQmxMoAHoECCQQAg), 2015**(chapter8)**  <https://www.sci.utah.edu/~gerig/CS6320-S2013/Materials/CS6320-CV-F2012-chap11-multiple-views.pdf> | | | | | | |
| Target Lecture  Hours: 2 | |
| Target Practical: 6 | |
| 1 | 01/12/23 | Explanation of Geometry of multiple views, Human Vision: Stereopsis, coloring | 1 | CO3,CO5 | 3 |  | Board /PPT |  |
| 2 | 01/12/23 | Explanation of Program on Erosion and Dilation of images using OpenCV in python. | 1 | CO3 | 3 |  | Board /PPT |  |
| 3 | 01/12/23 | Implementation of Program on Erosion and Dilation of images using OpenCV in python. | 1 | CO3 | 3 |  | using systems |  |
| 4 | 2/12/23 | Record+ observation corrections | 1 | CO3 | 1 |  | Records |  |
| 5 | **15/12/23** | **Test1,viva,**  **Record correction marks** |  | **CO1,CO2,CO3CO5** | **3** |  |  |  |
| 6 | 22/12/23 | Concepts on Converting an image from one color space to another. | 1 | CO3 | Co3 |  | Board /PPT |  |
| 7 | 22/12/23 | Explanation of program to Convert an image from one color space to another. | 1 |  |  |  | Board /PPT |  |
| 8 | 22/12/23 | Implementation of program to Convert an image from one color space to another. | 1 |  |  |  | Board /PPT |  |
| 9 | 23/12/23 | Record+ observation corrections | 1 | CO3 | 1 |  | Records |  |
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| MODULE 4: | | Reinhard Klette , Concise Computer Vision: An Introduction into Theory and Algorithms , 2014 **(Chapter 9)**  <https://www.csre.iitb.ac.in/~avikb/GNR401/DIP/DIP_401_lecture_7.pdf> , <https://arxiv.org/pdf/2305.18362.pdf> | | | | | | |
| Target Lecture  Hours: 2 | |
| Target PracticalHours:6 | |
| 1 | 28/12/23 | Explanation of Image classification Interfacing concepts | 1 | CO4 | 3 |  | Board /PPT |  |
| 2 | 28/12/23 | Explanation of program mouse/keyboard interface | 1 | CO4 | 3 |  | Board /PPT |  |
| 3 | 28/12/23 | Implementation of program mouse/keyboard interface | 1 | CO4 | 3 |  | Using systems |  |
| 4 | 29/12/23 | Record+ observation corrections | 1 | CO4 | 1 |  | Records |  |
| 5 | 6/01/24 | Explanation of Image Detection ,color detection | 1 | CO4 | 1 |  | Board /PPT |  |
| 6 | 6/01/24 | Explanation of program Draw cube with different color combination using arrays and perform X,Y,Z axis rotation using OpenCV/OpenGL | 1 | CO4 | 3 |  | Board /PPT |  |
| 8 | 6/01/24 | Implementation of Draw cube with different color combination using arrays and perform X,Y,Z axis rotation using OpenCV/OpenGL | 1 | CO4 | 3 |  | Using systems |  |
| 9 | 7/01/24 | Record+ observation corrections | 1 | CO5 | 1 |  |  |  |
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|  | MODULE 5: | Reinhard Klette , Concise Computer Vision: An Introduction into Theory and Algorithms , 2014 **(Chapter 10)**  Asthana, Sinha, &multicomputer Graphics& quote; Addison Wesley Newman and Sproul,  &quote; Principle of Interactive Computer Graphics &quote;, McGraw Hill**(CHAPTER 1,3)**  Online Materials: https://www.techtarget.com/searchenterpriseai/definition/face-detection  <https://www.researchgate.net/publication/353926582_Face_Images_Classification_using_VGG-CNN> | | | | | | |
| Target Lecture  Hours: 2 |
| Target PracticalHours:6 |
| 1 | 12/01/24 | Explanation of Image detection | 1 | CO5 | 2 |  | Board /PPT |  |
| 2 | 12/01/24 | Explanation of program 3D scene with movements using OpenCV/OpenGL | 1 | CO4 | 3 |  | Board /PPT |  |
| 3 | 12/01/24 | Implementation of program 3D scene with movements using OpenCV/OpenGL | 1 | CO4 | 3 |  | Using systems |  |
| 4 | 13/01/24 | Record+ observation corrections | 1 | CO4 | 1 |  |  |  |
| 5 | 19/01/24 | Explanation of Image classification ,image loading | 1 | CO5 | 1 |  | Board /PPT |  |
| 6 | 19/01/24 | Explanation of program  Loading the image and detect the face | 1 | CO5 | 3 |  | Board /PPT |  |
| 7 | 19/01/24 | Implementation of program Loading the image and detect the face | 1 | CO5 | 3 |  | Using systems |  |
| 8 | 20/01/24 | Record+ observation corrections | 1 | CO5 | 1 |  |  |  |
| 9 | 03/02/24 | **Test, viva,**  **Record correction marks** | 2,3 | CO3,CO4,CO5 | 3 |  |  |  |
| 10 | 10/02/24 | **Project, review, viva,**  **Record correction marks** | CO5 |  |  |  |  |  |

**Planned Module 1,2,3 assessment date:15/12/23**

Type of assessment: Test, quiz CO1, CO2,CO3 covered and BL 2,BL3

Actual Date of completion:

Total Strength of the class:73

Number of students attaining above 60% of the assessment marks:

**Planned Module 4,5 assessment date:,03/02/24**

Type of assessment: Test, quiz CO4,CO5 covered and BL 2,BL3

Actual Date of completion:

Total Strength of the class:

Number of students attaining above 60% of the assessment marks:

**PROJECT REVIEW:10/02/24**

Type of assessment: project, case study,. with CO5 ,BL4

Actual Date of completion:

Total Strength of the class:

Number of students attaining above 60% of the assessment marks:

**RUBRICS**

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| Work Completion | Excellent  The job was 100% complete and worked according to the task description. | Good  The was complete and worked, but needed minor modifications. | Fair  The job was complete but did not work; needed several minor modifications. | Poor  The job was complete but did not work; needed several major modifications. | Unacceptable  The job was incomplete and did not work. |
| Ability to Follow Directions | Excellent  Followed directions to the letter. | Good  Followed directions. | Fair  Moderately followed directions. | Poor  Did not follow directions. | Unacceptable  Did not appear concerned with directions. |
| Demonstrated Knowledge of Theory | Excellent  Student knows and is able to identify and explain necessary theories for completion of the project. | Good  Student is able to identify and explain necessary theories for completion of the project with some assistance. | Fair  Student is unable to identify or explain concepts without major prompting. | Poor  Student is not able to both identify and explain major theories. | Unacceptable  Student is unable to either identify or explain any related theories to the project. |
| Level of Needed Assistance to learn Tool | Excellent  Student was able to complete the task without assistance. | Good  Student was able to complete the task with little assistance. | Fair  Student was able to complete the task with moderate assistance. | Poor  Student was unable to complete task without major assistance. | Unacceptable  Student was unable to complete task with assistance. |
| Student Preparedness | Excellent  Student had/gathered all materials and was completely ready to go to work. | Good  Student had/gathered most materials and went to work. | Fair  Student had/gathered most materials, however, they needed excess time to do so. | Poor  Student did not have/gather some of the needed materials to perform work. | Unacceptable  Student did not have/gather the needed materials and was unable to perform work. |
| Time Management | Excellent  Routinely used time well throughout the project to get the job done on time. | Good  Used time fairly well throughout the project. | Fair  Procrastinated somewhat but did get the job done on time. | Poor  Was unable to adequately meet timeline due to inablility. | Unacceptable  Did not meet timeline due to procrastination or wasting time. |
| Care of Machine, Tools & Claenup | Excellent  Student took great care of the precision tools & and equipment that he or she used. All tools where retuned to tool room & the machine and work area was cleaned properly. | Good  Student took some care with the precision tools & equipment. Work area & machine where particaly cleaned. Some tools not returned to tool room. | Fair  Little care was taken with tools & machine. Few tools where returned to the tool room. Machine and work area not week cleaned. | Poor  Student failed to take care of tools and or did not clean the machine. | Unacceptable  Student was careless with tools & or machine resulting in broken tools or equipment. Student did not return tools to the tool room and aslo did not clean machine and assinged work area. |
| Total Score | Excellent  ---------------------- | Good  ---------------------- | Fair  ---------------------- | Poor  ---------------------- | Unacceptable  ---------------------- |

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