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| **Level** | 5 | | | | | | |
| **Course Code** | COU5302 | | | | | | |
| **Course Title** | Computer Graphics | | | | | | |
| **Credit value** | 3 | | | | | | |
| **Core/Elective** | Elective | | | | | | |
| **Prerequisites** | Fundamentals of programming practical (Pass) | | | | | | |
| **Hourly breakdown** | **Theory** | | **Practical**  **hours** | **Independent Learning** | **Assessments** | | **Total**  **hrs.** |
| 22 Sessions X 2 =**44 hrs.** | DS hrs. =**14 hrs.** | Lab x hrs.  = **09 hrs.** | Sessions (22x 3) = 66 hrs.  Online and Other Learning Resources = 9 hrs.  Lab (9x 0.5) = 4.5 hrs.  Total= **79.5 hrs.** | Continuous Assessments (CA) = **3.5 hrs.** | | **150 hrs.** |
| **Course Aim/s.** | To introduce the basic theories and techniques of computer graphics. To develop the programming skills on computer graphic applications | | | | | | |
| **PLOs addressed by course** | * **PLO1:** **Subject and Theoretical Knowledge:** Establish the fundamental and specialized knowledge and understanding in the area of Computer Science, and critically analyze data to make judgments and propose solutions to problems. * **PLO2: Practical Knowledge and Application:** Practical skill development and application to construct arguments, ideas, and solve problems effectively and efficiently in the field of computer science. * **PLO4: Teamwork and Leadership:** Initiative and understanding the need of solutions from others with independent and collaborative responsibility in professional environments. * **PLO5: Creativity and Problem Solving:** Construct sustained arguments and use these arguments and ideas with techniques to find solutions for a given situations. | | | | | | |
| **Course Learning Outcomes (CLO)** | At the completion of this course student will be able to:   * **CLO1:** Comprehend the basic concepts and principles in computer graphics (PLO 1) * **CLO2**: Identify and describe computer graphic methods including visible surface detection methods, illumination model and surface rendering methods, color models and applications (PLO 1) * **CLO3:** Developing competency in acquiring new knowledge in theoretically and practically and apply it in various situations (PLO2, PLO4, PLO5), * **CLO4:** Identify problems and incorporate suitable computer graphic techniques to solve the given problem (PLO 2, PLO4, PLO5) | | | | | | |
| **Content**  **(Main topics, sub topics)** | 1. Introduction to Computer Graphics, 2. Overview of Computer Graphics systems, 3. 2D output primitives, 4. 2D Transformations (Translation Rotation, Scaling), 5. Other Transformations (Reflection, Shearing), 6. Homogeneous Coordinates and combination of Transformation, 7. 2D Viewing, 8. 2D Clipping, 9. 2D Fill area Primitives, 10. 3D Object Representation, 11. 3D Coordinate system, 12. 3D Transformations, 13. 3D Viewing, 14. Projection, 15. 3D Clipping, 16. Visible surface detection Methods, 17. Illumination Models and Surface Rendering Methods, 18. Color Models and Applications, 19. Matrices for Computer Graphics, 20. Introduction to Computer Graphics Programming, 21. OpenGL Programming Part1 22. OpenGL Programming Part2 | | | | | | |
| **Teaching Learning methods (TL)** | Self-learning/independent learning of self - study (IL):   * Learning the course contents in course materials in print and web-based materials (SS) * Learning through practical exercises (PR) * Additional reading materials/ recommended reading (RE)   Contact sessions:   * Day schools (discussion sessions) (Non-compulsory) * Laboratory practical exercises (PR) (compulsory) | | | | | | |
| **Assessment strategy** | Overall Continuous Assessment Mark (OCAM): **40 %** | | | | | Final Assessment: **60 %** | |
| Details:  Continuous Assessment (CA I) : **01 hr**.  Continuous Assessment (CA II): **01 hr**.  Practical Assessment (PA) : **1.5 hrs**.  **OCAM = 0; If (PA) < 40**  **OCAM= 40 % of best CA I/CA II+ 30 % of other CA I/CA II   + 30 % of PA If (PA) ≥ 40** | | | | | Final Evaluation  Theory: **02 hrs**. | |
| **Overall mark** = 40 % OCAM + 60 % Final Examination | | | | | | |
| **Recommended**  **Readings:** | 1. Marschner, S., and Shirley, P., (2016), *Fundamentals of Computer Graphics - 4th Edition*, CRC Press 2. McConnell, J., (2005), *Computer Graphics: Theory into Practice*, Jones & Bartlett Learning 3. Hearn, D., and Baker, P., (2003), *Computer Graphics with OpenGL - 2nd Edition*, Prentice Hall | | | | | | |

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