Vision and Visualization (3-1-0)

	Hours
1. **Introduction to vision and visualization:** Short history, idea of space	3
2. **Transforms:** Moleding, viewing, clipping	4
3. **Object geometry:** primitives, splines, solids, curved surface	3
4. **Photometry:** Color, Illumination model, shading, ray tracing	4
5. **Image formation:** Optics, sensing, epipolar geometry, stereo-multi view	4
6. **Real camera:** modeling and calibration techniques	3
MID SEMESTER	
7. **Triangular Mesh Generation:** Triangulation, Polygonization	2
8. **Rendering:** Warping, Image composition, metamorphosis, 3D rendering, polygon rendering, scan, texture, hidden surface	4
9. **Clustering and segmentation:** Active contour, Geodesic contour, Balloon Model, Content Based Image Retrieval, Surveillance	4
10. **Object recognition:** Detector descriptor, Optical flow and tracking	3
11. **3D model Generation and Visualization**	2
12. **Animations**	2
13. **Virtual and Augmented Reality**	2
END SEMESTER	
Total Hours	**40**

Reference Books:

1. Computer Vision: A modern approach, Forsyth & Ponce, Prentice Hall.
2. Computer Vision and Applications, Bernd Jähne & Horst Haußecker, Academic Press.
3. Multiple View Geometry in Computer Vision, Richard Hartley and Andrew Zisserman, Cambridge University Press.
4. Computer Graphics C version, Donald Hearn & M. Pauline Baker, Prentice Hall.
5. Computer Graphics: Principles and practice, J. D. Foley & A. V. Dam & S. K. Feiner & J. F. Hughes, Addison-Wesley.

Teachers:

1. Ritwik Kumar Layek
2. Prabir Kumar Biswas
3. Somnath Sengupta