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| **Identification** | Title  | Computer Graphics |
| Department | Computer Science & Engineering |
| Program | M.Sc. - 6 credits |
| Semester | Fall 2017 |
| Instructor | Seyed Amir Hossein Siahpooshha (PhD) |
| E-mail: | siahpooshha@gmail.com |
| Classroom/hours | Neftchilar Campus, room# |
| Pre-requisites | B.Sc. Computer Science & EngineeringExcellent knowledge of programmingLinear algebra and multi-dimensional calculus skills |
| Language | English (intermediate level) |
| Type | Major (Compulsory) |
| **Course Resources** | 1. Introduction to Computer Graphics, by James D. Foley & Andries van Dam2. Geometric Modeling, by Michael Mortenson3. Class notes |
| **Course Objective** | Computer Graphics represents a vast technical field, ranging from mathematics and geometry topics to computer hardware and software engineering topics to rendering, animation and virtual reality. Computer Graphics is designed to provide graduate students with an introduction to the geometric modeling aspects of computer graphics, as well as the related topic of transformations. Course material will cover the various representations for 3D curves, surfaces and solids, and will also discuss the creation of complex, hierarchical models. Material on general topics in computer graphics, e.g. drawing/clipping algorithms, color, viewing and rendering, will also be interspersed throughout the class. |
| **Evaluation** | Midterm Exam | 30% |
| Project | 20% |
| Final Exam | 50% |
| **Weekly Lectures** |
| 1 | IntroductionMath Review and Introduction to Curves |
| 2 | DirectX programing based on C#  |
| 3 | Bezier Curve Drawing |
| 4 | Hermite and Catmull-Rom Curves |
| 5 | B-splines and NURBS |
| 6 | Drawing B-Splines Curves |
| 7 | SurfacesSubdivision Surfaces |
| 8 | Midterm Exam |
| 9 | Line DrawingCircle Drawing |
| 10 | Thick PrimitivesColor |
| 11 | Solid ModelingSolid Modeling Primitives |
| 12 | Introduction to 3D ViewingScanline RenderingCulling and Z-Buffering |
| 13 | Develop 3D environments (DirectX and C#) |
| 14 | 2D and 3D TransformationsHierarchical Models |
| 15 | Introduction to AnimationLevel Set Models |
| 16 | Final Exam - |