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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](mailto:siahpooshha@gmail.com) | |
| Classroom/hours | Neftchilar Campus, room# | |
| Pre-requisites | B.Sc. Computer Science & Engineering  Excellent knowledge of programming  Linear 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 Dam  2. Geometric Modeling, by Michael Mortenson  3. 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 | Introduction  Math 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 | Surfaces  Subdivision Surfaces | | | |
| 8 | Midterm Exam | | | |
| 9 | Line Drawing  Circle Drawing | | | |
| 10 | Thick Primitives  Color | | | |
| 11 | Solid Modeling  Solid Modeling Primitives | | | |
| 12 | Introduction to 3D Viewing  Scanline Rendering  Culling and Z-Buffering | | | |
| 13 | Develop 3D environments (DirectX and C#) | | | |
| 14 | 2D and 3D Transformations  Hierarchical Models | | | |
| 15 | Introduction to Animation  Level Set Models | | | |
| 16 | Final Exam - | | | |