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| المملكة العربية السعوديةوزارة التعليم العالي**جامعة أم القرى**الكلية الجامعية بالجموم – قسم الحاسب الآلي |  | Kingdom of Saudi ArabiaMinistry of Higher Education**Umm Al-Qura University**University College in Al-JamoumComputer Dept. |

Course Specification

1. **Course number and name:** (2316430-3) Computer Graphics
2. **Credits and contact hours:** 3 Credits

(Lecture: 2/week – Practical Session: 3/week)

1. **Instructor’s or course coordinator’s name:** Dr. Mohamed Othmani
2. **Text books**
3. **Main Text book:** D. Hearn, and M. Baker, Computer Graphics, 4th Edition, Prentice Hall, 2000.
4. **References:**

Hearn and Baker, Computer Graphics with OpenGL, 3rd Edition, Prentice Hall, 2004.

Dave Shreiner and The Khronos, OpenGL Programming Guide: The Official Guide to Learning OpenGL, Version 3.1, 7th Edition, OpenGL ARB Working Group, Addison-Wesley, 2009.

1. **Specific course information**
2. **brief description of the content of the course (Catalog Description):**

The course offers an introduction to computer graphics, algorithms, and software. Topics include overview of graphics algorithms, 2D line drawing, 2D and 3D geometric transformations, 2D and 3D viewing, 2D and 3D clipping, 2D and 3D object representation.

1. **prerequisites or co-requisites:** Multimedia Systems (2316211-3)
2. **indicate whether a required, elective, or selected elective course in the program:** required
3. **Specific goals for the course**

The student will be able to:

1. Develop and understanding of design fundamentals, classic themes and mechanisms, and different approaches to representation.
2. Understand the overall human context in which computer graphics activities take place.
3. Geometric Modeling, Problem Solving, Applying Technology, Graphic Designing, Computer Programming.
4. Develops skills and knowledge critical to all areas of computer graphics specialization.
5. Develop conceptual principles, processes, and techniques essential to all areas of computer graphics.

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| *Course* *Goals* | *Program Outcomes* |
| SOa | SOb | SOc | SOd | SOe | SOf | SOg | SOh | SOi | SOj | SOk |
| 1 | ✓ |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  | ✓ |  |  |  |  |  | ✓ |  |  |
| 3 | ✓ |  | ✓ |  |  |  |  |  | ✓ | ✓ |  |
| 4 |  |  | ✓ |  |  |  |  |  | ✓ | ✓ |  |
| 5 |  |  |  |  |  |  |  |  | ✓ | ✓ |  |

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| **Relationship of Course Goals to the Program Student Outcomes** |
| **SOa** | An ability to apply knowledge of computing and mathematics appropriate to the discipline* *Students apply knowledge of computer graphics (modeling and rendering) to complete assessments.*
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| **SOc** | An ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs.* *Students design and write simple programs in labs. Students design and implement a software project to meet a specification.*
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| **SOi** | An ability to use current techniques, skills, and tools necessary for computing practices.* *Students use current computing and modeling/design tools such as OpenGL, Blender, etc.*
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| **SOj** | An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.* *Students use mathematical knowledge (vectors, transformations, modeling, etc) to design a solution to a problem and to document the solution including the tradeoffs involved in their design choices.*
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1. **Brief list of topics to be covered**
* Introduction to graphics
* Mathematical Foundation for Graphics
* 2D graphics algorithms
* 2D and 3D Transformation and representation
* 2D viewing
* 3D Object Representations
* 3D viewing