Course Specifications of:

Virtual Reality Applications in Architecture

Program(s) on which the course is given:M.Sc.- Architectural Design

Compulsory or Elective element of program: Elective

Department offering the program: Architecture

Academic year / Level: year/ 2014 -2015

Date of specification approval: June 2012

1. Basic Information
2. Title: Virtual Reality Applications in Architecture Code: Arch607
3. Credit Hours: 3 Lecture: 3 practical: 0
4. Semester work: 120 Final Exam: 90 Practical: 90 Total: 300
5. Professional Information

1- Overall aims of course:

1. Recognize the benefits of using virtual simulation in architectural design field.
2. Understand how to create virtual environments and utilize them to professional practice.
3. Provide training in the application of augmented reality in architecture.
4. Promote visions about architecture of the future.
5. Provide training in the direct application of technology to architectural field and advanced solutions for design problems.

2- Intended learning outcomes of course (ILOs):

1. **Knowledge and understanding**

2.1.2 Describe the two way impact of the relationship between professional practice and its effect on the environment.

2.1.3 Recognize the scientific developments in the area of architectural design.

2.1.4 Recognize the moral and legal principles of professional practice in the area of architectural design.

1. **Intellectual skills**

2.2.1 Classify and assess information in the field of Architectural design and draw analogies to solve problems.

2.2.3 Link different knowledge sources to solve problems.

2.2.5 Indicate a plan for performance development in the area of architectural design.

1. **Professional and practical skills**

2.3.1 Analyze basic professional and modern skills in the area of architectural design.

2.3.2 Write and evaluate professional reportsand enhance verbal and graphical skills.

2.3.3 Assess methods and current tools in the area of architectural design.

1. **General and transferable skills**

2.4.1 Experiment Communicating effectively using different means.

2.4.2 Use information technology in order to serve the development of professional practice.

2.4.6 Apply self-learning and continuous education practices.

3- Contents

|  |  |  |  |
| --- | --- | --- | --- |
| Topic No. | Topic | No. of weeks | Total no. of hours |
| 1 | Concepts of virtual simulation | 1 | 3 |
| 2 | the use of virtual environment | 1 | 3 |
| 3 | the use of computer programming in the production of virtual environments | 1 | 3 |
| 4 | the use of computer programming in the production of virtual environments | 1 | 3 |
| 5 | Creating Virtual Reality Applications on a  Parallel Architecture | 1 | 3 |
| 6 | An Adaptive Virtual Reality  Architecture for Shopping Malls | 1 | 3 |
| 7 | VIRTUAL REALITIES | 1 | 3 |
| 8 | Midterm Exam | 1 | 3 |
| 9 | Boosting up Architectural Design Education  with Virtual Reality | 1 | 3 |
| 10 | CURRENT AND FUTURE HUMAN SCALE VR FACILITIES AND THEIR APPLICATIONS \_ | 1 | 3 |
| 11 | Affordable Virtual Reality System Architecture for  Representation of Implicit Object Properties | 1 | 3 |
| 12 | A Virtual Environment for Conceptual Design in Architecture | 1 | 3 |
| 13 | Physical Environment and Image Environment | 1 | 3 |
| 14 | APPLICATION OF AUGMENTED REALITY GIS IN ARCHITECTURE | 1 | 3 |
| 15 | Oral exam | 1 | 3 |
| 16 | Final exam | 1 | 3 |
| TOTAL | | 16 | 45 |

4- Course Matrix

|  |  |  |
| --- | --- | --- |
| ILO’s code number | Teaching/learning methods and strategies | Assessment methods and strategies |
| 2.1.2  2.1.3  2.1.4 | Acquisition of core knowledge and understanding is achieved mainly through   * lectures, * seminars, * directed reading,. | Assessment will be through   * individual coursework assignments, * oral arranged discussions about particular issues. |
| 2.2.1  2.2.3  2.2.5 | Analysis and problem‐solving skills are developed through   * lectures, * seminars * small group exercises. * project work and independent study. | Assessment of students   * prepared term research paper * number of essays prepared in responses to research * Research skills are developed through a research project in the course * Analysis and design skills and creativity are assessed through oral, written examinations, and Quizzes * Quizzes based abilities are mainly assessed through performance |
| 2.3.1  2.3.2  2.3.3 | * Projects demonstrations, * practical work, * practical based projects in selected particular sites, visits for site analysis | Practical skills are assessed through   * Quizzes prepared concept designs, * report writing about it, coursework exercises * project based on research presentations, * oral exams |
| 2.4.1  2.4.2  2.4.6 | * Presentations in several seminars (compulsory to be attended by a panel of departmental staff and other students). * Attendance of workshops * Compulsory writing reports | general skills are assessed through   * report writing * coursework exercises * oral exams * project based on research presentations, |

5- Assessment schedule

* Assessment 1 Assignments on week’s9-14
* Assessment 2 Midterm exam on week 8
* Assessment 3 Oral exam on week 15
* Assessment 4 Final exam on week 16

6- Weighting of assessments

* 30% Home assignments
* 10% Midterm examination
* 30% Oral examination
* 30% Final-term examination
* 100% Total

7- List of References

* Juan A. Barceló, Maurizio Forte, and Donald H. Sanders, Virtual Reality in Archaeology, ArcheoPress, Oxford, 2000.

# Fan Dai, Virtual Reality for Industrial Applications,Springer-Verlag New York, Inc. Secaucus, NJ, USA ©1997.

8- Facilities required for teaching and learning

Lecture room equipped with overhead projector

Presentation board, computer and data show

9- Intended learning outcomes of course (ILOs) Matrixes

**9.1 Matrix 01: Course contents & ILO's**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **No. of weeks** | **Course Content** | **Total no. of hours** | **a. Knowledge andunderstanding** | | | **b. Intellectual Skills** | | | **c. Professional Skills** | | | **d.General Skills** | | |
| 2.1.2 | 2.1.3 | 2.1.4 | 2.2.1 | 2.2.3 | 2.2.5 | 2.3.1 | 2.3.2 | 2.3.3 | 2.4.1 | 2.4.2 | 2.4.6 |
| 1 | Concepts of virtual simulation | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 | the use of virtual environment | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 3 | the use of computer programming in the production of virtual environments | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 4 | the use of computer programming in the production of virtual environments | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 5 | Creating Virtual Reality Applications on a  Parallel Architecture | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 6 | An Adaptive Virtual Reality  Architecture for Shopping Malls | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 7 | VIRTUAL REALITIES | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 8 | Midterm Exam | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 9 | Boosting up Architectural Design Education  with Virtual Reality | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 10 | CURRENT AND FUTURE HUMAN SCALE VR FACILITIES AND THEIR APPLICATIONS \_ | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 11 | Affordable Virtual Reality System Architecture for  Representation of Implicit Object Properties | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 12 | A Virtual Environment for Conceptual Design in Architecture | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 13 | Physical Environment and Image Environment | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 14 | APPLICATION OF AUGMENTED REALITY GIS IN ARCHITECTURE | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 15 | Oral exam | 3 |  |  |  |  |  |  |  |  |  |  |  |  |
| 16 | Final exam | 3 |  |  |  |  |  |  |  |  |  |  |  |  |

**9.2 Matrix 02: Aims & ILO's**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Aims**  **ILO's** | **1** | **2** | **3** | **4** | **5** |
| 2.1.2 |  |  |  |  |  |
| 2.1.3 |  |  |  |  |  |
| 2.1.4 |  |  |  |  |  |
| 2.2.1 |  |  |  |  |  |
| 2.2.3 |  |  |  |  |  |
| 2.2.5 |  |  |  |  |  |
| 2.3.1 |  |  |  |  |  |
| 2.4.2 |  |  |  |  |  |
| 2.3.3 |  |  |  |  |  |
| 2.4.1 |  |  |  |  |  |
| 2.4.2 |  |  |  |  |  |
| 2.4.6 |  |  |  |  |  |

Course coordinator: **dr./Islam gonimy**

Course instructor: **dr./Islam gonimy**

Date 25 / 11 / 2014