Implementing Successful Building Information Modeling Course Definition Document

Course: Implementing Successful Building Information Modeling – BIM-F Master qualification and specialization in the Department of Building Information Modeling -

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Number of sessions: 12, (24) hour

normal:

Course summary : This course is prepared as a Student Guidebook for implementing building information modeling (BIM) within various organizations working in the engineering field. The course consists of two main parts, the first part contains the definition of BIM technology, its importance and its implementation mechanism, by explaining the benefits of BIM application and the requirements for its implementation during the various stages of the project life cycle, including preparing work teams and determining the BIM process, data management, quality Control and other that. While the second part present a local and global perspective of BIM as it is being implemented in design and construction companies. Accordingly, students can learn from these experiences in an optimal manner, which allows him to contribute to the smooth transition of engineering companies operating in the CAD system to the BIM system.

Article code: BIM-F

Grade C1 & C2

Article chapters:

Chapter number	Chapter title	Brief explanation
1	**Introduction to BIM and its importance during the life cycle of the engineering project**	Definition of the most important terms in the BIM literature during the project life cycle, starting from the initial architectural idea to managing the structure and restoration.

2	**A comparison between CAD & BIM during the production stages of the project**	to clarify the extent of the positive impact of using BIM in large projects, while shedding light on some international experiences.
3	**BIM Implementation requirements**	Outlines the steps needed to plan and successfully implement BIM in a company, Study the effects on employees and changes in tasks and processes that will be adopted to produce the work
4	**The BIM team**	Introducing the teams that will lead the project production process using BIM during the project life cycle and its tasks.
5	**The BIM process**	Explaining the mechanism of tracking the flow of data, where the collection, analysis, and then making decisions regarding the project becomes more efficient and effective using one common database.
6	**Collaboration between different project entities using BIM**	Explain the importance of collective collaboration secured by applying BIM technology during the entire project life cycle, whereby participants are able to make more informed decisions from the start of projects and reduce errors and costs.
7	**Quality control and risk management**	Discuss the methods used to improve the quality of work produced using BIM, and the impact this improved quality has on risk management in the construction industry.
8	**Interoperability and open standards**	Explain the importance of achieving interoperability and the ability to share digital data between different applications through agreed definitions called open standards.
9	**Data management**	Clarify the methods for collecting, extracting, storing, and sharing data
10	**Case studies**	Explanation of some case studies for BIM implementation at the local level
11	**Case studies**	Explanation of some study cases for the BIM implementation at the Arab level
12	**Case studies**	Explanation of some study cases for BIM implementation at the international level

Outcomes:

Learning Outcomes	Learning Outcomes	Synchronous sessions	Assignments/ projects	Exam
The student is provided with the necessary knowledge, concepts and terminology related to BIM	**LO1**	√	√	√
The ability to understand the requirements for applying BIM in engineering projects	**LO2**	√	√	√
Know the tasks of the work teams that will lead the project production process using BIM during the project life cycle	**LO3**	√	√	√
The ability to know and determine the mechanism of the progress of the BIM application process and the importance of cooperation between the various project workers to achieve this	**LO4**	√	√	√
Identify the methods used to improve the quality of work produced using BIM and data management within the BIM work environment	**LO5**	√	√	√
Knowing the importance of achieving interoperability and being able to share digital data between different applications using open standards.	**LO 6**	√	√	√
Benefit from local and international experiences in the field of BIM application	**LO 7**	√	√	√

Evaluation criteria:

Learning Outcomes	Evaluation Criteria To achieve the results, the student must demonstrate the capabilities in:
LO1	1- Re-read the most important terms and concepts that the professor dealt with in the lecture. 2- It raises inquiry questions about the meaning of each term/concept and how it relates to reality. 3- He studies the theories, programs and codes related to the terms and concepts that were circulated in the lecture. 4- He writes down all the ideas he has seen in a special booklet that is easy to refer to when needed.
LO2	1- He reviews the method and mechanism of identifying the project from the reality of an actual project in a company or engineering office that he intends to consider as a case study. 2- He collects and categorizes information about his project considered as a case study. 3- He reviews the requirements and objectives of the projects and writes down the requirements and objectives of his project as a case study. 4- He reviews the project restrictions and applies it to his project as a case study.
LO3	1- Knowing the types of teams and their tasks necessary to work during each stage of the project's production. 2- The extent of his ability to determine the tools to be used in each stage. 3- Proposing training mechanisms to ensure continuity of work in accordance with the current system used in production in engineering companies.
LO4	1- Define the role and tasks of each team in the working groups 2- Determining the delivery mechanism, the level of detail and the necessary information at each stage. 3- Determine ownership of the digital model at each stage of the project. 4- Determining the mechanism for exchanging data, forms and tools used.

LO5	1- Assessing the completeness of the data and the degree of detail used in building the digital model. 2- Verifying the quality of the outputs and the extent to which they are free of problems that may lead to a delay in the implementation time and an increase in costs. 3- The extent of knowledge of the process of data sharing and the use of mechanisms that serve the speed and accuracy of designing, implementing and managing the facility. 4- The ability to choose the appropriate tools to achieve items 1 & 2.
LO6	1- Knowing the different formulas adopted to deliver the project during each stage to ensure the continuity of coordination and cooperation between the various project workers and during all stages of its implementation. 2- Identify the most important codes for managing BIM projects.
LO 7	1- Extent of the ability to benefit from local, Arab and international experiences by discussing the negatives and positives that they were exposed to.

Instructions:

Generating Evidence : The student individually prepares a brief report in which he demonstrates his ability to understand the previous outcomes, and this is before he takes the exam and deals with:

- Problems facing project management in companies and offices working in the engineering field.
- How does BIM technology contribute in solving or reducing these problems.
- The ability to propose an integrated plan for the BIM implementation within these companies in a manner that ensures a smooth transition to it.

References

First - foreign books:

[1] Eastman, Charles M., Building Product Models, Boca Raton, FL: CRC Press, 1999.

[2] Eastman, Charles M., et al., BIM Handbook: A Guide to Building Information Modeling, New York: John Wiley & Sons, 2008.

[3] Erika Epstein, Implementing Successful Building Information Modeling, USA: Norwood, Artech House, 2012.

[4] Architecture2030.org, http://architecture2030.org/about/about_us, 2011.

[5] Michael Scarnak, Los Angeles BIMStorm, Onuma System BIM Mail, 2008.

[6] Ibid.

[8] Erika Epstein, Los Angeles BIMStorm, OnumaSystem BIM Mail, 2008.

[9] Rocky Mountain Institute's Green, http://www.greenfootstep.org/.

Second - websites related to the course:

[1] http://www.onuma.com/services/LondonPanel.php.

Virtual meetings : The virtual meetings continue concurrently with the simultaneous sessions and listen to all the requirements of the students.

Suggestions for reading : mentioned above