Diploma in

Building Information Modelling(BIM) Technology (D.Voc.)

1 Year Diploma Program

(Academic Year :2020-21)

Under

National Skill Qualification Framework(NSQF), UGC, New Delhi &

& KIT's College of Engineering(Autonomous) Kolhapur

Affiliated Shivaji University, Kolhapur

Introduction

Building Information Modelling (BIM) is one of the major development that has been seen in Architectural, Engineering, Construction and Operation (AECO) industry over the last two decades. Many countries have taken a shift towards BIM adoption. Government organizations have made BIM implementation mandatory for contractors while delivering their projects. India having a multi-billion dollar AECO industry and being the second largest growing industry has tremendous potential and scope for growth of BIM.

BIM Technology program is prepared to initiate the process of Parametric Modelling amongst the students who are interested to serve in AECO industry. The Program also set with an objective of creating more opportunities in terms of entrepreneurship by learning advanced techniques of data management by using BIM platform in construction and engineering projects. For this, pool of Industry experts presently working in field of BIM are involved in process of curriculum design and execution.

This program not only focus on skill based learnings in BIM Technology but also on educational aspects of soft skills such as effective verbal and written communication and contract managements. Course is designed with single exit point (after 1st certificate program, of 6 months) from where he/she will be in position to acquire an employability at level-4 of NSQF. At the end of the complete duration of 1 year of Diploma Program, students will acquire Level-5 of NSQF as provided in UGC guidelines.

DIPLOMA IN BIM TECHNOLOGY (1 Year)

Teaching and Examination Scheme

Certificate Course in BIM Fundamentals		**Teaching Scheme**		**Credits**	**Examination**	
Sub No.	**Subjects**	**Theory sessions**	**Hands on session**		**Theory**	**PE**
BIMF1	BIM Foundation	10		04	50	
BIMF2	BIM Families and Library Developments	10	10	04		50
BIMF3	BIM-3D Parametric Modelling	50	40	06		100
BIMF4	Clash Detection and Coordination	25	15	06		100
BIMF5	Common Data Environment setup and Usage	05	05	04		50
BIMF6	Project Assignment		50	06		100
	TOTAL	100	125	30	50	400

Certificate Course in BIM Advanced		**Teaching Scheme**		**Credits**	**Examination**	
Sub No.	**Subjects**	**Theory sessions**	**Hands on Sessions**		**Theory**	**PE**
BIMA1	Delivering Level 2 BIM in projects	10		03	50	
BIMA2	Modelling of Infra projects and 4D BIM	20	10	08		100
BIMA3	Modelling through Scripts and 5D BIM	20	10	08		100
BIMA4	6D BIM Project Sustainability	05	05	08		100
BIMA5	Internship (3 months)		100	03		50
	TOTAL	55	125	30	50	350

Semester -1 BIM Fundamentals

BIMF1 BIM Foundations

Credits:04
Teaching Hours: 10 Sessions of 2 hours each **Marks:**50 Marks
Examination: 1 Hour MCQ examination of 25 Questions of 2 marks each

Objective:

In this Subject of BIM Foundations, Learners are expected to understand the Global trends in Digital Transformation and key topics involved in delivering BIM in building, infrastructure and cities projects. Learners are also expected to understand how to deliver BIM in buildings, infrastructure and smart cities project.

Contents:

Global trends in Digital transformation journey, BIM Uses, BIM in project life cycle, Employers information requirement, High strategy plan, BIM Execution Plan, Common Data Environment, Integrated Project Delivery, Level of Detail and Development, Soft-Landings of BIM Projects, Claims, Disputes and litigations in BIM projects, ISO 19650 series, BIM Maturity levels, Integrating Lean and Green with BIM Projects, Return on Investment.

BIMF2 BIM Families and Library Development

Credits:04
Teaching Hours:10 sessions by Industry partner
+10 sessions Hands on sessions **Marks:**100 Marks
Assessment method: 10 assignments of 10 marks each

Objective:

In this subject, Learners will have start implementing concept of parametric modelling on basic components of a project.

Contents:

Development of BIM library, creating new families of components, Editing existing families. Manage families across various software platforms of BIM.

BIMF3 3D BIM - Parametric Modelling

Credits:06
Teaching Hours:50 sessions by Industry partner+
20 Hands on sessions **Marks:**100 Marks
Assessment method: 10 assignments of 10 marks each

Objective:

In this subject, Learners will have hands on training on modelling of components of Project on Parametric modelling software adopted worldwide in BIM industry.

Contents:

Modelling of Parametric components based on requirement of building, Infrastructure projects. Extracting data, schedules, quantities, sheets, sectional drawings. Use of Libraries and families for Model development.

BIMF4 Clash Detection and Coordination

Credits:06

Teaching Hours: 25 sessions by industry Partner
+20 Hands on sessions **Marks: 100 marks**

Assessment method: 10 assignments of 10 marks each

Objective: In This subject, Learners will execute integration of parametric model within BIM environment and resolve conflicting issues for efficient coordination.

Contents:

Integration of models developed in architectural, structural, MEP platforms and services. Identification of probable clashes of parametric components in terms positions of elements in integrated model. Resolving clashes.

BIMF5 Common Data Environment Setup & Usage

Credits:04

Teaching Hours: 5 Sessions by Industry Partner
+5 hands on sessions **Marks:**50 marks

Objective: In this subject, students will learn about common environment under which all stakeholders will collaborate for coordination activities.

Contents: What is Common Data Environment(CDE), Need for CDE, Various platforms/ Software of CDE practiced globally, data accessibility for project stakeholders with various project roles, permissions and responsibility of data. Data standardisation for sharing on CDE platform.

BIMF6 Project Assignment

Credits:06

Teaching Hours: 50 Hands on Sessions **Marks:** 100 Marks

Assessment method: project completion assigned by Industry partners, presentation in front of External examiner.

Objective: Learners will execute a detailed project on Parametric Modelling with various data sets as a part of Building Information Model.

Contents:

An Industry assigned project is required to execute on parametric modelling software. A detailed presentation on project executed needs to be delivered. Project need to be performed by predefining objective formulated with industry partners. This activity need to be performed in Group of maximum five members and necessary communications amongst five and subject teacher need to be presented during final presentation.

Semester -2 BIM Advanced

BIMA1 Delivering Level 2 BIM in Projects

Credits:03

Teaching Hours: 10 sessions of 2 hours each **Marks:**50 Marks

Examination: 1 Hour MCQ examination of 25 Questions of 2 marks each

Objective:

In this subject, Learners will understand how to deliver Level 2 BIM in AECO sector projects. Students are also expected to understand the templates and tools involved in project phases such as brief, concept, definition, design, build and commission, handover and operation phases. Candidates must be capable of establishing Project BIM Strategies.

Contents:

BIM grading tool, ROI Analysis tool, creating project life cycle process maps, BIM Project phases checklist, Model production delivery template, model information delivery plan, Soft Landing Delivery Plan, Whole life cycle carbon assessment tool, Client project Information Manager ITT Template, BIM contract document journey, CDE scope requirements, model production delivery table, model review meeting minutes, model review meeting agenda, etc.

BIMA2: Infra modelling and 4D BIM

Credits:08

Teaching Hours: 20 sessions by Industry partner and
+ 10 Sessions of Hands on training, **Marks:**100 Marks

Examination: 10 Assignments based on Infra modelling & 4D level of BIM

Objective:

Learners will model Infra projects and apply Concept scheduling and planning of project activities in Building Information Model Common Data Environment

Contents

Building Information Modelling software utilised worldwide for scheduling and Tracking of projects and its coordination with model. Processes of Planning of activities with reference to various elements of model. Study of BIM workflow within 4D environment

BIMA3 : Modelling by Script + 5D BIM

Credits:08

Teaching Hours: 20 session by Industry partner
+ 10 sessions hands on training **Marks:**100 Marks

Assessment method: 10 Assignments based Script modelling and 5D level of BIM

Objective: learners will understand concept modelling through scripts of Energy analysis, cost aspect of Project.

Contents

Parametric modelling by Programming scripts, Introduction of Python for model development and Study of BIM workflow within 5D environment including quantities and costing of project WBS.

BIMA4 6D BIM – Project sustainability analysis

Credits:08

Teaching Hours: 10 sessions **Marks:**100 Marks

Assessment method: Energy analysis with minimum 5 iterations

Objective: learners will understand concept of Energy analysis, Sustainability and cost aspect of Project with reference of BIM Common Data Environment with

Contents

Plugins available with present BIM software for energy analysis, BIM 360. Study of BIM workflow within 6D environment, introduction & methodology of Scan to BIM

BIMA5 Internship

Credits:03

Teaching Hours: Minimum 100 Hours of Internship online/ onsite **Marks:**100

Assessment method: Presentation on experiences and learning from Internship with detail report.

Objective: Learners will be exposed to professional office environment for developing individuals for working in BIM environment

Contents:

Three months of Internship at Company location or online assignment based on prevailing conditions offered by BIM service providers. A detail report and presentation need to be submitted at the end of internship period for award of certification

NOTE: Use of software's for content delivery includes products currently practiced globally such as by Autodesk, Bentley, Trimble, Dassault.

Examination Scheme

1st semester of Diploma BIM technology Program

Certificate Course in BIM Fundamentals		Credits	Examination		Evaluation Scheme	
Sub No.	**Subjects**		**Theory**	**PE**	**Component**	**Min. marks for Passing**
BIMF01	BIM Foundation	04	50		ESE (MCQ)	20
BIMF02	BIM Families and Library Developments	04		50	ISE	20
BIMF03	BIM-3D Parametric Modelling	06		100	ISE	40
BIMF04	Clash Detection & Coordination	06		100	ISE	40
BIMF05	Common Data Environment setup and Usage	04		50	ISE	20
BIMF06	Project Assignment	06		100	ESE(POE)	40
	TOTAL	**30**	**50**	**400**		

2nd Semester Diploma BIM technology Program

Certificate Course in BIM Advanced		Credits	Examination		Evaluation Scheme	
Sub No.	**Subjects**		**Theory**	**PE**	**Component**	**Min Marks For Passing**
BIMA01	Level 2 BIM	03	50		ESE(MCQ)	20
BIMA02	Infra Projects and 4D BIM Project Schedule	08		100	ISE	40
BIMA03	Modelling by Scripts and 5D BIM Project cost	08		100	ISE	40
BIMA04	6D BIM Project Sustainability	08		100	ISE	40
BIMA05	Internship (3 months)	03		50	ESE (POE)	20
	TOTAL	**30**	**50**	**350**		

- ISE consist of 10 Assignments of 10 marks each, to be submitted by student as per schedule provided during Course
- ESE consist of 50 marks MCQ test and POE with Presentation of Project, Internship in front of Examination Panel consisting of Internal and External experts (Industry Partners).