VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY, NAGPUR

Type of online course: Certificate

Course title: Certificate course on Product Design, Validation and Simulation

Offered by: V. R. Jamdar Siemens Center of Excellence, VNIT Nagpur (Interdisciplinary Board)

Eligibility: Diploma/ B.Tech (Any branch) (2nd Year Completed), M.Tech (Electrical, Electronics, Mechanical, and related branches) (First Semester Completed). Bonafide students of VNIT Nagpur are not eligible.

Proposed Maximum Duration: 3 months

Total contact hours: 100 (Lecture: 0+ Tutorial: 16 + Practical: 84)

Mode of course delivery: Hybrid

Course Objectives:

1. Understand the importance of product validation and simulation in the design process
2. Learn to simulate product behaviour under different conditions and loads
3. Understand the principles of finite element analysis (FEA) and how to use it to simulate product performance
4. Understand role of reverse engineering in product design

Course structure (per week equivalent):

Sr. No.	Courses (Titles)	L	T	P	Cr
1	Product Design, Validation and Simulation	0	1	6	4
	Total	0	1	6	4

Course fee: Rs. 20,000+ 18% GST

Course Contents:

Sr. No.	Course Title and Topics	Hours	
1	Product Design, Validation and Simulation	Tutorial	Practical
1.1	Introduction to Product design, sketching, modelling, surface creation basics, synchronous modelling, assembly and drafting overview, Introduction to FEA	4	30
1.2	Reverse Engineering	4	12
1.3	NX CAM and Post builder, Milling 3 axis, Milling Multi axis operation and machining simulation, wire EDM and drilling operation, cutting parameters and non cutting moves, blank and tool creation, cut level options, turning operations, post builder basics, NX mold basics, NX sheet metal basics	4	30
1.4	Structural Simulation, Thermal Simulation	4	12
	Total Hours	16	84

Course Outcomes:

1. Appreciation of the importance of product validation and simulation in the design process.
2. Ability to simulate product behavior under different environmental conditions and loads.
3. Understanding of the principles of finite element analysis (FEA) and its application in simulating product performance.
4. Knowledge of the role of reverse engineering in product design.
5. Ability to create accurate and reliable simulations for optimizing product design and performance.

Attendance requirement: 100 % mandatory, 25% relaxation may be given by course coordinator

Course Evaluation plan: Mid-term (30%) + End Term(30%) + Teacher's Assessment (40% which includes mini project)

Course Coordinator(s)(Name and Sign):
Dr. Ravikumar Dumpala
(Professor Incharge, Design and Validation Lab, VRJSCOE)

Dr. M. S. Kotambkar
(Professor Incharge, Design and Validation Lab, VRJSCOE)

Prof. A. B. Andhare
(Professor Incharge, Test and Optimization Lab, VRJSCOE)

Dr. Ashwin S. Dhoble
(Professor Incharge, Test and Optimization Lab, VRJSCOE)

Prof. Rashmi Uddanwadiker
(Professor Incharge, Reverse Engineering Lab, VRJSCOE)

Dr. Ravindra Keskar
(Professor Incharge, Advanced Manufacturing Lab, VRJSCOE)

Lab Coordinator(s)(Name and sign):
Trainers for Design and Validation Lab and Test and Optimization lab and Reverse Engineering Lab of VRJSCOE and Center Manager

Course Execution Coordinator (Name and Sign):

Prof. Shital S. Chiddarwar
Center Head
V R Jamdar Siemens CoE