4.3.1: Institution frequently updates its IT facilities including Wi-Fi

Institution has adequate IT infrastructure which is updated and upgraded continuously as per the curriculum requirements and changing technology. Wi-Fi zones are provided at various locations such as reading halls, hostels, and department corridors which can be updated as per requirement. A case study of mechanical department is elaborated related to the above topic i.e. frequently updates its IT facilities including Wi-Fi

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1. IT Facilities in Mechanical Engineering Department

The Mechanical Engineering Department started in the year 1992. The department has well equipped CAD CAM lab for under graduate (UG) and post graduate students (PG). The objective is to develop of designs of various mechanical components using both 2D and 3D Software's, and manufacture the required part. All computers are interconnected by LAN. Internet facility is available on every computer in the laboratory. The lab is available to graduate the students in the fields of Computer Aided Design and Computer Aided Manufacturing. At Under graduation level aid is given for the students to model the complete part. The basic knowledge can be used for successful accomplishment of project works. At post-graduation level, the students can make use of advanced modules in the design software for their research work.

The software like AUTOCAD, CREO, FEATURECAM, ANSYS, MATLAB, MINITAB, WITNESS SIMULATION are available to UG and PG students.

Two separate CAD CAM labs are available for UG Students with 64 computers and 10 computers for PG students respectively.

2. Updating IT facilities (Computers & Peripherals)

Computers and other hardware are updated according to curriculum and research requirements.

For S.E Mechanical, Course Name: Computer Aided Machine Drawing (Course Code: 202042), computers with fast processors and latest graphics configurations were required as per curriculum for using CREO 5.0 (Required System configurations are mention below).

Accordingly, Dell make computers with 16 GB RAM and 4 GB graphics cards were purchased in year 2018.

ptc creo

eSoftner

System Requirements		
Main Memory (RAM)	Operating System	Recommended amount
	Windows 10 64-bit	4GB or higher
	Windows Server 2012 R2 and 2016	4GB or higher
	Windows 8.1 64-bit	4GB or higher
	Windows 7 64-bit	4GB or higher
Internal Browser Support	One of the following: • Microsoft Internet Explorer 11.0 • Embedded Chromium Browser	
Browser Support for PTC Creo 5.0 Help Center	PTC Creo Help supports Internet Explorer 9.0 and later, and Mozilla Firefox 10.0.1 and later. The Help Center opens in your default browser.	
Monitor	1280 x 1024 (or higher) resolution support with 24-bit or greater color	
Network	Microsoft TCP/IP Ethernet Network Adapter	
Mouse	Microsoft-approved 3-button mouse	
File systems	NTFS - Universal Naming Convention (UNC)[2]	
Misc.	DVD drive	
NOTES		
2. PTC does not test any specific technologies which provide UNC support (Samba, DFS, WebDAV, NAS appliances, etc.)		

Graphics Information

For 3D-hardware acceleration, an OpenGL graphics card must be used that has been tested in a PTC-certified configuration. To ensure the compatibility of a graphics driver with Creo 5.0, a PTC certified or supported hardware configuration is recommended. Graphics cards that support at least OpenGL 4.0 are recommended for Creo 5.0.

PTC recognizes that customers can benefit from using latest graphics driver and performance optimizations and improvements made by PTC's Graphics Hardware Partners. With new workstations being continuously certified by PTC, the most current graphics drivers used in the certification process can now be re-applied to previously certified configurations, as long as the configuration belongs to the same combination of workstation and graphics hardware families.

Support for High DPI Monitors

Creo 5.0 supports High DPI Monitors.

Workstation Vendor	Certified and Supported Graphics Cards		
	AMD (ATI)	NVIDIA	INTEL
Dell	Yes	Yes	No
Cisco	No	Yes	No
Fujitsu	Yes	Yes	No
HP	Yes	Yes	Yes
HPE	No	No	Yes
Lenovo	Yes	Yes	Yes
Microsoft	No	No	Yes

CAD CAM LAB- UG

Sr. No	IT Facilities	Quantity	Cost	Date of Purchase
1	Dell make Computers Specifications- Core IT 7700, Processor 16 GB, DDR- 4 RAM, AMD Radom R 7 450, 4 GB graphics card, 2 TB HDD, WIN 10 Pre-loaded, DVD RW, monitor 21.5 "	40	39,41,200	15-03-2018
2	Zenith Make Computers P IV processor, C2D, 3 GB Ram upgraded, DVD writer,160GB HDD,17" SQ monitor TFT	65	25,79,200	31-10-2008
3	Server IBM make Specifications: Intel Xenon processor, E 5405,2 GHz,12 MB RAM,Quadcore processor,	1	67,600	15-05-209
4	Laptop LENOVO make Specification: Intel DCT 4300,2.1 GHz,2 GB RAM, 250 GB HDD, DVR RW	1	35308	07-12-2009
5	Laptop Dell make Specifications: I3 processor, 3 GB RAM, 320 GB HDD, 15.6" monitor	1	38500	15-07-2010
6	Mini Laptop Samsung make Mini Laptop, Model no-100, MA 011 10.1	2	311850	04-11-2011
7	LCD Projector, SHARP, multimedia projector MODEL XR 105	1	62000	22-08-2006
8	XEROX Machine	1	120000	31-01-2011
9	Printer -HP make LASER 1020	2	18795	17-02-2012
10	Printer – HP make LASER 1022	1	17000	11-09-2005
11	3 KVA/72 VDC UPS-Single phase I/P & O/P UPS Batteries	1 2 set	39015 190000	17-05-2017 07-02-2017

CAD CAM LAB- UG

Sr. No	IT Facilities	Quantity	Cost	Date of Purchase
1	HP make Computers Specifications- AMD 10 Processor, 7800 B 3.5 G, 500 GB HDD, 8 GB RAM,18.5" LED monitors	10	418750.50	14-03-2013

3. Updating Software

Softwares are updated according to curriculum and research requirements. For TE Mechanical, Course Name: Numerical Methods and Optimization (Course Code: 302047), required MATLAB, accordingly department purchased it in the year 2018. For this subject, department is also using open-source software SCILAB and OCTAVE. For BE Mechanical, Course Name: Industrial Engineering (Course Code: 402049 B) required practical

assignments using simulation software, accordingly department purchased WITNESS simulation software in 2018.

3.1 Syllabus

TE Mechanical Syllabus of Course Numarical Methods and Optimization (302047

Savitribai Phule Pune University, Pune

TE Mechanical, Mechanical Sandwich and Automobile (2015 course)

Course Code: 302047 Course Name : Numerical Methods and Optimization

Teaching Scheme:	Credits	Examination Scheme:
TH: -04 hrs/week	TH:--04	TH In-Sem: -- 30 End-Sem: --70
PR: 02 hrs /week	PR:--01	PR: -- 50

Term-Work

1. Program on Roots of Equation (Validation by suitable solver, all three compulsory)
a) Bisection Method, b) Newton Raphson method c) Successive approximation method

2. Program on Simultaneous Equations (Validation by suitable solver, all three compulsory)
a) Gauss Elimination Method, b) Thomas algorithm for tridiagonal matrix, c) Gauss-Seidal method.

3. Demonstration of optimization technique using suitable solver.

4. Program on ODE(Validation by suitable solver, all three compulsory)
a) Euler Method, b) Runge-Kutta Methods- fourth order, c) Simultaneous equations.(Runge-Kutta 2nd order: *One step only*).Simple pendulum equation or Spring mass damper equation

5. Program on PDE(Validation by suitable solver): Laplace equation

6. Program on Curve Fitting using Least square technique (Validation by suitable solver, all four compulsory)
a) Straight line, b) Power equation, c) Exponential equation, d) Quadratic equation

7. Program on Interpolation(Validation by suitable solver, all three compulsory)
a) Lagrange's Interpolation, b) Newton's Forward interpolation,

8. Program on Numerical Integration(Validation by suitable solver, all four compulsory)
a) Trapezoidal rule, b) Simpson's Rules (1/3rd, 3/8th) [In one program only], c) Gauss Quadrature Method- 2 point, 3 point. [In one program only], d) Double integration: Trapezoidal rule

NOTE:

1. Solver is compulsory for all above programs and compared with actual solution.
2. Manual solution for each problem.
3. Algorithms and Flowcharts are compulsory for all programs.

Savitribai Phule Pune University

Final Year of Mechanical Engineering (2015 Course)

Course Code : 402049 B | **Course Name : Elective – III Industrial Engineering**

Teaching Scheme:		Credits		Examination Scheme:			
Theory	: 03 Hrs Per Week	TH	: 03	Theory	In-Sem : 30	PR	: --
Practical	: 02 hrs per week	TW	: 01		End-Sem : 70	OR	: --
						TW	: 25

Term Work shall consist of following assignments:

- Minimum of *8 Experiments* are compulsory from the following list of Experiments.
- Assignment number *1, 2, 3, 8* and *12* are compulsory.
- It is advisable that, students shall collect data by visiting suitable industry to complete following assignments (*Per batch of Max. 20 students*)
- For completing above assignments *any suitable simulation software* like WITNESS can be used

1. Case study based Assignment on Method Study.
2. Hands on Assignment on application of Work Measurement technique(s).
3. Assignment on simulation of Routing & Scheduling Model
4. Assignment on simulation of Manufacturing System / Service System Operations for demand forecasting of the given product using any two methods.
5. Assignment on simulation determination of EOQ and plot the graphs.
6. Assignment on analysis of Manufacturing / Service Operation for Capacity Planning.
7. Case study based assignment on supply chain model.
8. Assignment on analysis of (selected) plant layout modeling and simulation for bottleneck / line balancing.
9. Assignment on analysis of material handling system - modeling simulation for the selected plant layout.
10. Case study based assignment on identification of Key Result Areas for performance appraisal for selected company (3600 feedback).
11. Case study based assignment on cost-revenue model analysis.
12. Assignment on industrial safety audit of selected work environment.

3.2 Purchase/Updating of Software

Software Used In Cad-Cam Lab- UG

Sr. No	Name of Software	Number of License users	Total Cost	Date of Purchase
1	I-DEAS	2	1,21,680	04-04-2001
2	Auto CAD 2002	3	1,26,000	04-01-2001
3	BORLAND TURBO C++	15	58,500	31-01-2001
4	Auto CAD 2002	4	98,000	04-09-2002
5	CATIA V5	20	4,50,000	26-07-2010
6	Ansys 14.0	25	3,40,000	12-05-2012
7	Feature CAM	20	6,20,363	09-09-2015
8	MATLAB 2018	5	1,00,684	03-08-2018
9	Witness Simulation	10	3,83,500	29-12-2018
10	CREO 5.0	50	5,00,000	21-12-2019

For PG, to fulfil purpose of post experimental statistical analysis, MINTAB software was purchased in the year 2018.

Software Used In Cad-Cam Lab- PG

Sr. No	Name of Software	Number of License users	Total Cost	Date of Purchase
1	ANSYS 16.2 with CFD	5	2,40,000	06-10-2015
2	MINITAB 18	3	41,300	23-10-2018
3	MATLAB 2018	5	1,00,684	03-08-2018
4	CREO 5.0	50	5,00,000	21-12-2019

For PG, to fulfill purpose of post experimental statistical analysis, MINTAB software was purchased in the year 2018.

4. Lab Utilization

CAD CAM lab for UG and PG is engaged as per table given below

Sr. No	Course Name	Required Software	Year	Semester
1	Computer Aided Machine Drawing	Creo 5.0	SE Mechanical	III
2	Numerical Methods and Optimization	MATLAB, SciLab	TE Mechanical	V
3	CADCAM	Creo, Ansys, Featurecam	BE Mechanical	VII
4	Finite Element Analysis	MATLAB, Ansys	BE Mechanical	VII
5	Industrial Engineering	Witness Simulation	BE Mechanical	VIII
6	Advanced Engineering Mathematics	MATLAB	ME Design Engg	I
7	Advanced Machine Design	Ansys	ME Design Engg	II

5. Supporting Documents

Use a following links for the proof of supporting documents.

Sr. No.	File Description	Link to open
1.	Softwares CAD-CAM UG, PG Mech dead stock register	Click Here
2.	Software screenshot	Click Here
3.	Dead stock entries Computers & peripherals	Click Here
4.	Utilization of IT Facilities	Click Here
5.	Internet bills	Click Here Click Here
6.	Wifi Purchase Order (PO)	Click Here