FR. Conceicao Rodrigues College Of Engineering
Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50
Department of Production Engineering

B.E. (Production) (semester VIII) (2018-2019)

Lecture Plan

Subject: Computer Aided Manufacturing (PEC802)   **Credits-04**

1. **Syllabus.**

Module	Contents	Hrs.
01	**Introduction** Elements of CAM system, Computer Numerical control of Machine Tools, Fundamental elements of CNC, Benefits of CNC, Computer control concepts, Data processing units & Binary calculation.	04
02	**Rapid prototyping** Introduction to rapid Prototyping and rapid tooling.	04
03	**Basics of control systems** Motion controller, Interpolation-Linear & Circular, Positioning & Contouring control loops, Incremental & Absolute system, DNC & CNC systems and Adaptive control system. **CNC Hardware Basics** CNC drives, Spindle design, Actuation and Feedback devices	06
04	**CNC Tooling** Turning tools, Milling tools, Tool pre setter, ATC, work holding devices and Cutting process parameters.	06
05	**CNC Programming** Introduction to CNC Lathe & Milling, Touch probe system, Tool length, nose radius & Diameter compensation, Turning & Machining centre programming, CNC part programming using ISO controllers, Canned cycles, Looping Jumping Subroutines Macros, Parametric programming, Computer aided part programming using APT and Post processing.	16
06	**CIM** Computer applications in manufacturing, Automation and Integrated Production management systems. Automated Material handling systems, Conveyors, AVG, AS/RS, Automated inspection procedure, Distributed Numerical control & Benefits of CIM and implementation & computer aided shop floor control system.,	12

2. **CO Statements.**

PEC802.1: Student will be able to understand importance of CIM
PEC802.2: Student will be able to apply various manufacturing strategies.
PEC802.3: Student can demonstrate working of CNC m/c.
PEC802.4: Student can evaluate tool path in G and M Codes.

3. **CO-PO-PSO Mapping.**

CO# / PO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PEC802.1	2	0	0	-	-	-	-	-	-	-	-	0
PEC802.2	2	0	0	-	-	-	-	-	-	-	-	0
PEC802.3	2	0	2	-	3	-	-	-	-	-	-	2
PEC802.4	2	2	2	-	3	-	-	-	-	-	-	2

CO# / PSO#	PSO1	PSO2
PEC802.1	2	-
PEC802.2	2	-
PEC802.3	2	-
PEC802.4	2	-

4. **CO Assessment tools with target.**

Co Statement #	Target for Assessment Tools			
	Unit Test	**Assignment**	**End Semester Exam**	**Course Exit Survey**
PEC802.1	40%	20%	30%	10%
PEC802.2	40%	20%	30%	10%
PEC802.3	40%	20%	30%	10%
PEC802.4	40%	20%	30%	10%

5. Curriculum Gap/Content beyond syllabus (if any).
   --
6. Lecture/Lab/Mini Project/Assignment Plan.

Week No.	Topics	Module	Hours
Week 1 (02/7/18 – 08/07/18)	Elements of CAM system, Computer Numerical control of Machine Tools, Fundamental elements of CNC, Benefits of CNC, Computer control concepts, Data processing units & Binary calculation.	1	4
Week 2 (09/7/18 – 15/07/18)	Motion controller, Interpolation-Linear & Circular, Positioning & Contouring control loops, Incremental & Absolute system, DNC & CNC systems and Adaptive control system.	3	4

Week 3 (16/7/18 – 22/07/18)	CNC drives, Spindle design, Actuation and Feedback devices	3	4
Week 4 (23/7/18 – 29/07/18)	Turning tools, Milling tools, Tool pre setter, ATC	4	4
Week 5 (30/7/18 – 05/08/18)	Work holding devices and Cutting process parameters.	4	4
Week 6 (06/08/18 – 12/08/18)	Introduction to CNC Lathe & Milling, Touch probe system.	5	4
Week 7 (13/8/18 – 19/08/18)	**Unit Test 1 (Aug 13,14,16)**		
Week 8 (20/08/19 – 26/08/19)	Tool length nose radius & Diameter compensation, Turning & Machining centre programming,	5	4
Week 9 (27/8/18 – 02/09/18)	CNC part programming using ISO controllers, Canned cycles, Looping Jumping Subroutines Macros,	5	4
Week 10 (3/09/19 – 09/09/19)	Parametric programming, Computer aided part programming using APT and Post processing.	5	4
Week 11 (10/09/19 – 16/09/19)	Mid term break		
Week 12 (17/9/18 – 23/09/18)	Computer applications in manufacturing, Automation and Integrated Production management systems	6	4
Week 13 (01/10/18 – 07/10/18)	Automated Material handling systems, Conveyors, AVG, AS/RS. Automated inspection procedure.	6	4
Week 14 (08/10/18 – 14/10/18)	**Unit Test 2 (Oct 10,11,12)**	6	4

Week 15 (15/10/18 – 21/10/18)	Distributed Numerical control & Benefits of CIM and implementation & computer aided shop floor control system.	**6**	**4**
Week 16 (22/10/18 – 28/10/18)	Introduction to rapid Prototyping and rapid tooling.	**2**	**4**
Week 17 (29/10/18 – 04/11/18)	**Term Work Submission**	**-**	**-**
Week 18 (05/11/18 – 11/11/18)	**Term End (Nov.10)**	**-**	**-**

FR. Conceicao Rodrigues College Of Engineering
Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50
Department of Production Engineering

T.E. (Production) (semester VI) (2018-2019)

Lecture Plan

Subject: Process Engineering and Tooling Laboratory (PEL602)   **Credits-01**

1. **Syllabus.**

Sr no	Design Exercise /Assignment.
01	Assignment on CNC Control systems.
02	Assignment on CNC hardware.
03	Assignment on CNC Programming.
04	Assignment on CIM Tools.
05	Practical on CNC Lathe.
06	Practical on CNC Milling.
07	Practical on Modeling and Simulation

2. **Lab Plan.**

Week No.	Topics	Hours (Per Batch)
Week 3 (16/7/18 – 22/07/18)	Assignment on CNC Control systems.	2
Week 4 (23/7/18 – 29/07/18)	Assignment on CNC hardware.	2
Week 5 (30/7/18 – 05/08/18)	Assignment on CNC Programming.	2
Week 6 (06/08/18 – 12/08/18)	Assignment on CNC Programming.	-

Week 7 (13/8/18 – 19/08/18)	**Unit Test 1 (Aug 13,14,16)**	
Week 8 (20/08/19 – 26/08/19)	Assignment on CIM Tools.	**2**
Week 9 (27/8/18 – 02/09/18)	Practical on CNC Lathe.	**2**
Week 10 (3/09/19 – 09/09/19)	Practical on CNC Milling.	**2**
Week 11 (10/09/19 – 16/09/19)	Mid term break.	**2**
Week 12 (17/9/18 – 23/09/18)	Practical on Modeling and Simulation.	**2**
Week 13 (01/10/18 – 07/10/18)	Practical on Modeling and Simulation.	**2**
Week 14 (08/10/18 – 14/10/18)	**Unit Test 2 (Oct 10,11,12)**	**2**
Week 15 (15/10/18 – 21/10/18)	Practical on Modeling and Simulation	**--**
Week 17 (29/10/18 – 04/11/18)	**Term Work Submission**	**--**
Week 18 (05/11/18 – 11/11/18)	**Term End (Nov.10)**	