

**DEPARTMENT OF PRODUCTION ENGINEERING  
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI-620015.**

COURSE OUTLINE			
Course Title	<b>PRPC17 FORMING TECHNOLOGY</b>		
Course Code	PRPC17	No. of Credits	03
Department	Production Engineering	Faculty	Mr. N.M. Vijay Aravindhana
Pre-requisites Course Code			
Course Coordinator(s) (if, applicable)			
Email Id	nmvijay@nitt.edu	Contact No.	7845913442
Course Type	Core course	<input checked="" type="checkbox"/>	Elective course
Course overview			
<p>Yield criteria for ductile metals - Flow theories – strain hardening - recrystallization</p> <p>Fundamentals of metal forming- Effect of temperatures, speed and metallurgical microstructure on forming processes - Mechanics of Metal Forming</p> <p>Forging Processes Forging Equipment, Forging defects - Types of Rolling mill - process variables – defects</p> <p>Types of extrusion - Process variables - Wire drawing - Drawing and Deep drawing – Sheet metal working</p> <p>High energy rate forming processes.</p>			
Course objectives			
<ul style="list-style-type: none"> <li>➤ To apply basic of metal forming processes to shape products to their desired without any defects</li> </ul>			

## Course Outcomes

- Understand the properties of ductile materials
- Understand the effect of temperature, speed on metal forming process.
- Understand the principle procedure and applications of Bulk Metal Forming and Sheet Metal Forming.

## LESSON PLAN:

Topic	No of Hours	Cumulative Hours	Mode of delivery
Introduction to Metal Forming	01	01	C&T
Yield criteria for ductile metals	02	03	C&T
Flow theories	02	05	C&T
strain hardening in metal forming	01	06	C&T
recrystallization in metal forming	02	08	C&T
Fundamentals of metal forming	01	09	C&T
Effect of temperatures	02	11	C&T
Effect of speed	01	12	C&T
Effect of metallurgical microstructure	02	14	C&T
Effect of friction and lubrication	01	15	C&T
Mechanics of Metal Forming	01	16	C&T
Forging Processes – types and operations	02	18	C&T, PPT
Forging Equipment	01	19	C&T, PPT
Forging defects and problems	01	20	C&T, PPT
Types of Rolling mill	01	21	C&T, PPT
process variables in rolling	01	22	C&T, PPT
defects in rolling	01	23	C&T, PPT
Types of extrusion	01	24	C&T, PPT
Extrusion Process variables	01	25	C&T, PPT
Extrusion equipment, lubrication and defects	01	26	C&T, PPT
Sheet metal forming – equipment and toolings	01	27	C&T, PPT
Stretch forming	01	28	C&T, PPT
Deep drawing	01	29	C&T, PPT
Blanking, Punching, fine blanking	01	30	C&T, PPT

Bending	01	31	C&T, PPT
Wire drawing & Rod Drawing	01	32	C&T, PPT
Explosive Forming	01	33	C&T, PPT
Electro-hydraulic forming	01	34	C&T, PPT
Electromagnetic forming	01	35	C&T, PPT
High velocity forming	01	36	C&T, PPT
Recent trends in forming	02	38	C&T, PPT
Review	02	40	C&T, PPT

### COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Syllabus	Week	Duration	% Weightage
1	Cycle Test 1	Unit I & II	4 <sup>th</sup> Week	60 Minutes	20
2	Assignment I	Unit I & II	5 <sup>th</sup> Week		5
3	Cycle Test 2	Unit III & IV	9 <sup>th</sup> Week	60 Minutes	20
4	Assignment II	Unit III & IV	12 <sup>th</sup> Week		5
CPA	Compensation Assessment (Written Test)	–		60 Minutes	Refer course policy
5	Descriptive Type Examination (End Semester)	–		180 Minutes	50
Total Assessment					100

**ESSENTIAL READINGS: Textbooks, Reference Books Website addresses, journals, etc.**

**Text Books**

1. *Narayanasamy,R., “Metal forming technology”2nd Edition, Ahuja Pub,2000.*
2. *William F Hosford and Robert M Caddell “ Metal Forming Mechanics and Metallurgy” Third Edition, Cambridge University Press,2008*

**Reference Books**

*1.George E.Dieter , “Mechanical Metallurgy”,1st edition McGraw Hill book Co.- Koga, 2002 2.ASM Handbook on Forming and Forging, Vol.14, 9th Edition ,ASM International.,1998*

**COURSE EXIT SURVEY** (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

- Feedback from the students during class committee meetings
- Anonymous feedback through questionnaire

**COURSE POLICY** (including plagiarism, academic honesty, attendance, etc.)

**CORRESPONDENCE**

1. All the students are advised to check their NITT WEBMAIL regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be done through their webmail only.
2. Queries (if required) to the course teacher shall only be emailed to the email id specified by the teacher.

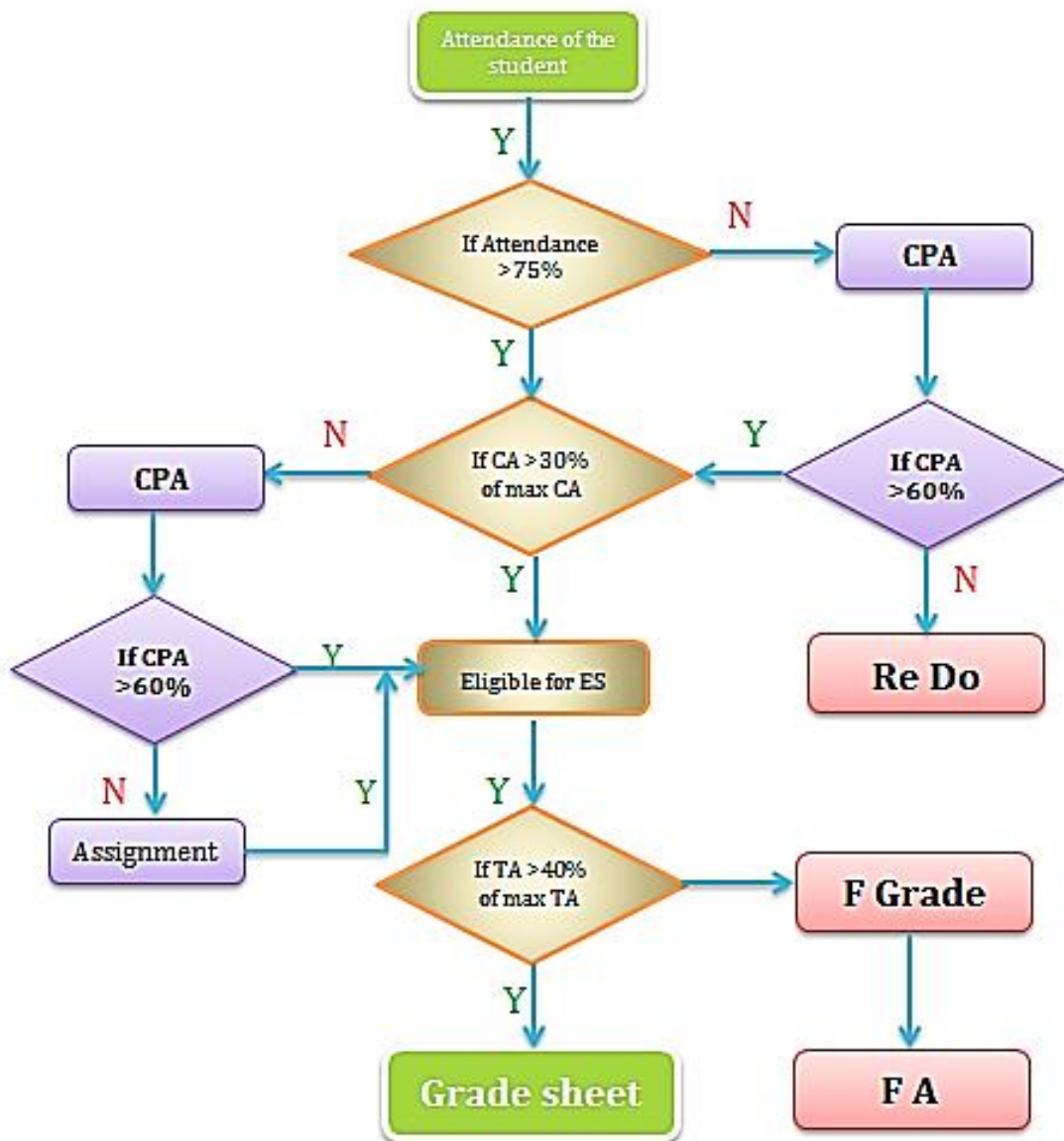
## **ATTENDANCE**

1. Attendance will be taken by the faculty in all the contact hours. Every student should maintain minimum 75 % physical attendance in these contact hours along with assessment criteria to attend the end semester examination.
2. Any student, who fails to maintain 75% attendance need to appear for the compensation assessment (CPA). Student who scores more than 60 % marks in the CPA along with assessment criteria will be eligible for attending the end semester examination.
3. Those students who have attendance lag and also missed any of the continuous assessments (CAs) can appear for CPA to get eligibility for writing the end semester examination as quoted in Pt. 2. Their scores in the CPA WILL NOT be taken into account for computing marks for CA.
4. Students not having 75% minimum attendance at the end of the semester and also fail in CPA (scoring less than 60%) will have to RE DO the course.

## **ASSESSMENT**

1. Attending all the assessments is MANDATORY for every student.
2. If any student is not able to attend any of the continuous assessments (CAs: Cycle test) due to genuine reason, student is permitted to attend the compensation assessment (CPA) with 20 % weightage. (This is not valid for students who have attendance lag also. Refer Pt. 3 under Attendance)
3. At any case, CPA will not be considered as an improvement test.
4. Students are expected to score minimum 30% of the maximum mark of the class in the CAs to attend the end semester examination in addition to the attendance requirement. Otherwise the student is permitted to attend CPA and is expected to score more than 60% marks to get eligibility to appear for end semester examination. However, the score in CPA WILL NOT be considered for computing marks for CA. Student who fails to score 60% in CPA will take up additional assignments to get eligibility for writing End Semester examination.
5. Finally, every student is expected to score minimum 40% of the maximum mark of the class in the total assessment (1, 2, 3, 4 and 5) to pass the course. Otherwise the student would be declared fail and 'F' grade will be awarded. Further he can take up only FORMATIVE ASSESSMENT.

Refer the following flow chart for more clarity:



CA: Continuous Assessment Mark of a student TA: Total Assessment Mark of a student  
 Max.CA : Maximum Continuous Assessment Mark of the class Max.TA : Maximum Total Assessment Mark of the class FA : Formative Assessment ES: End Semester  
 CPA: Compensation Assessment

**ACADEMIC HONESTY & PLAGIARISM**

1. All the students are expected to be genuine during the course work. Taking of information by means of copying simulations, assignments, looking or attempting to look at another student's paper or bringing and using study material in any form for copying during any assessments is considered dishonest.
2. Tendering of information such as giving one's program, simulation work, assignments to another student to use or copy is also considered dishonest.
3. Preventing or hampering other students from pursuing their academic activities is also considered as academic dishonesty.
4. Any evidence of such academic dishonesty will result in the loss of marks on that assessment. Additionally, the names of those students so penalized will be reported to the class committee chairperson and HoD of the concerned department.
5. Students who honestly producing ORIGINAL and OUTSTANDING WORK will be REWARDED.

**ADDITIONAL COURSE INFORMATION**

The faculty is available for consultation at times as per the intimation given by the faculty.

**FOR APPROVAL**

**Course Faculty**

**CC-Chairperson**

**HOD**