A Report on

“ME 1301 Surface Engineering”- A One credit Course

(IIBatch – ODD Semester2015-16)

Course offered by: **India Pistons Group**

Resource Persons from IP Rings: **1. Dr.N.Gowrishankar**

2.Mr.U. Jaikrishna

3. MrsMalathy

Summary:

SRM University took an initiative last year to bridge the gap between industry and academia through a one credit course offered by industry partners. The Department of Mechanical Engineering continues to take the journey ahead with the support of India Pistons. A one credit course on Surface Engineering was offered to second batch of students of Mechanical Engineering byDr.Gowri Shankar, Director India Pistons and his team during odd semester 2015-16. Eleven students of final year mechanical engineering and three IP Rings officials registered for this course.The course was startedwithpre-course test on 22nd August 2015 and was concluded with final examinationon 03thNovember 2015.During the course theory classes were conducted in SRM University and the students were taken to IP rings, IP pins and JATA Auto auxiliaries to demonstrate the industrial practices**.** The case studies presented by resourcepersonnel were really a great attraction for the students. The students were very enthusiastic during the course discussions every day and also recommended to organize such courses in future. Ten students did their final year project works in India Pistons Group. The students thanked the India pistons, IP Rings for helping their projects.

SRM Students during interactive session with Dr.Gowri Shankar- Director, India Pistons

Details of Classes handled during the Course:

ME 1301 Surface Engineering					
One Credit Course offered by Dr.N.Gowrishanker , Director , India Pistons.					
Session August -October2015					
Day	**Session**	**Topic**	**Duration**	**Time**	**Duration**
22/8/2015	FN	Pre Course test	30mins	8:15am-8:45am	45mins
		Importance of Surface Engineering In Industrial Environment	30mins	9:00am–9:30am	180mins
		Introduction, definition, classifications, principles, scope, surface dependent properties, friction and wear	60mins	9:30am-10:30am	
		Introduction to Surface Roughness and its measurement	30mins	10:30am-11:00am	
		Break	15 min	11:00am 11:15am	
	AN	Surface engineering to change surface chemistry-diffusion heat treatment coatings, carburizing, carbo-nitriding, nitriding,vacuum carburizing	60 mins	12:00pm-1:00pm	
29/8/2015	FN	Surface engineering to change surface metallurgy-flame hardening, induction hardening, laser beam hardening, laser melting, shot peening	60 mins	9:00am - 10:00am	135mins
		Surface engineering practices in auto component Part I	30 mins	10:00am-10:30am	
		Break	15mins	10:30am-10:45am	
		Surface engineering practices in auto component Part II	45mins	10:45am-11:30am	
05/09/2015	FN	Surface engineering to add surface layer or coating: Surface Characterization techniques:Scanning Electron Microscopes Images, Atomic Force Microscopes, Tunnelling Electron Microscopes, EDX,X-ray Diffraction	60mins	9:00 to 11:00am	180mins
		Surface engineering to add surface layer or coating: Electroplating,DLC,Plasma Spraying, HVOF, Carbide nitride coatings, chrome plating and Nickel plating	60mins		
		Break	15 min	11:00am-11:15am	
		Surface Engineering of cylinder components Part I	30 mins	11:15am-12:00pm	

	Lunch				**12:00pm-12:45pm**	
	AN	**Surface Engineering of cylinder components Part II**		**30 mins**	**12:45pm - 1:15pm**	
03/10/2015	**FN**	**Surface engineering to change surface chemistry**	**Phosphating**	**60 mins**	**9:00am-10:00am**	**165mins**
			Chromate chemical conversion, anodizing, oxidation treatments	**60mins**	**10:00am-11:00am**	
		Break		**15 mins**	**11:00-11:15am**	
		Faiure Analysis related to surface coating in automobile industry		**45 mins**	**11:15am - 12:00pm**	
10/10/2015	**FN**	**PVD,CVD,Cladding**		**60mins**	**9:00 to 10:00am**	**150mins**
		Total Quality Management in Surface Engineering in auto component industries Part I		**30mins**	**10:00 to 10:30am**	
		Break		**15mins**	**10:30am - 10:45am**	
		Total Quality Management in Surface Engineering in auto component industries Part II		**30mins**	**10:00 to 10:30am**	
		Discussion with Dr.NG and Mr. UJ		**30mins**	**12:00pm-12:30pm**	
	AN	**Visit to IP Rings (PVD,CVD)**				
3/11/2015	**FN**	**Examination (Duration 120minutes)Sujective :50marks,Objective 50marks.**				

Demonstrations of Industrial Practices	
Date	Name of Industry
3/09/2015	**Visit to JATA Auto Auxilliaries**
14/09/2015	**Visit to IP Rings and IP Pins**

- ## Supporting members:

The Course was organized by the Department of Mechanical Engineering with the support of the following faculty members:

1. Dr.M.Gopal (Prof/Mech)
2. Dr.G.Murali (HOD/Mechatronics)

3. Mr.ShubrajitBhaumik (AP/Mech)
4. Mr.A.Thirugnanam (AP/Mech)
5. Mr.R.Murugesan (AP/Mech)
6. Mr.Veeranath (AP/Mech)

- **Selection Procedure**:
  First come first servebasis and on the interest of students.
- **No Students selected and participated**: 14
- Participant's Attendance sheet

Sl. No.	Register No.	Participants	22.08.15		29.08.15		03.09.15		05.09.15		14.09.15		03.10.15		10.10.15	
			FN	AN	FN	AN	FN	AN	FN	AN	FN	AN	FN	AN	FN	AN
1	1021210195	Aditya Rai	p	P	A	NA	P	NA	P	P	A	NA	P	NA	P	P
2	1021210114	N Yuvaraj Singh	p	P	P	NA	P	NA	P	P	A	NA	P	NA	P	P
3	1021210108	Shubham	p	P	P	NA	P	NA	P	P	P	NA	P	NA	P	P
4	1021210646	Sai Kishore Vemana	p	P	P	NA	P	NA	P	P	A	NA	P	NA	P	P
5	1021210693	Hanu Chandra	p	P	P	NA	P	NA	P	P	P	NA	P	NA	P	P
6	1021210561	Vignesh B	p	P	P	NA	P	NA	P	P	P	NA	P	NA	P	P
7	1021210347	Sailesh K	p	P	P	NA	P	NA	P	P	P	NA	P	NA	P	P
8	1021210606	Tavarish Kumar	p	P	P	NA	P	NA	P	P	P	NA	P	NA	P	P
9	1021210576	MunavarFairoseShamsudien C	p	P	P	NA	P	NA	P	P	P	NA	P	NA	P	P
10	1021210116	SiddhantGuha	p	P	P	NA	P	NA	P	P	P	NA	P	NA	P	P
11	1021210579	Gurashish Singh Mehadwan	p	P	P	NA	P	NA	P	P	P	NA	P	NA	P	P
12	IP RINGS	C. Mahadevan	p	P	P	NA	P	NA	P	P	NA	NA	NA	NA	P	P
13	IP RINGS	P. Jeevanandham	p	P	P	NA	P	NA	P	P	NA	NA	NA	NA	P	P
14	IP RINGS	S.Arun Prasad	p	P	P	NA	P	NA	P	P	NA	NA	NA	NA	P	P

- **Pre Session Test** :
  A pre session test was conducted to test the knowledge level of the students in Surface Engineering.

PRE-COURSE TES MARK - "ME 1301 SURFACE ENGINEERING "			
Sl no.	Regd Number	Name	Before the course max marks 100
1	1021210108	SHUBHAM	23
2	1021210693	V.HANU CHANDRA	31
3	1021210606	TAVARISH KUMAR	11
4	1021210116	SIDDHANT	21
5	1021210646	SAI KISHORE VEMANA	19
6	1021210576	MUNAVAR FAIROZE	25
7	1021210579	GURASHISH SINGH	11
8	1021210561	V.VIGNESH	36
9	1021210114	N. YUVRAJ SINGH	22
10	1021210195	ADITYA RAI	21
11	1021210347	K.SAILESH	21
12	IP RINGS	P.JEEVANANDAM	63
13	IP RINGS	S.ARUN PRAsad	47
14	IP RINGS	C.MAHADEVAN	56

- **Details of Final Year Projects taken by studentsduring Even semester**

Sl No	Project Team Members	Register Number	Project Title	Industry
1	V.HanuChandra , V.SaiKishore	1021210693, 1021210646	Plasma spraying-a project for recovery,reprocessing,and recycling of sprayed, undeposited powder	IP rings , MM Nagar
2	MunavarFairose , Tavarish Kumar , GurashishSingh	1021210576 , 1021210606 , 1021210579	Cold forming vs hot and cold forming a surface quality assessment	IP rings , MM Nagar
3	Shubham, SiddhantGuha AbhayHoshing	1021210108 , 1021210116 , 1021210110	Effect of time delay in grinding and carburising on TCD and ECD	IP rings , MM Nagar
4	Aditya Rai, Vignesh	1021210195, 1021210561	Etched Chrome Performance Evaluation	India Pistons, Sembium

- **Feedback from students**:

  A Feedback was collected from students in standard format. The overall response was Good. The students expressed such programme can be continued.

Evaluation of the Course

Sl No	Objectives of one credit course on Surface Engineering Course	Status
1	Creating Awareness on Surface Engineering	Met
2	Avenue to take industry related problems	Met
3	Students learn industrial practices	Met
4	Improve industry –institute relations	Met
5	To Make students Employable	Met. IP rings interested to take 3 students

- ## Examination :

Final Examination is conducted on 3rd November 2015 from 9:00am – 11:00am.

Question Paper Pattern:

Multiple Choice Questions : 50x1marks = 50 marks.

The marks obtained was submitted to COE for necessary actions.

This course was co-ordinated by Prof.M.Gopal and assisted by Mr.ShubrajitBhaumik (AP/Mech).