MOU - 18 (1)

CONFIDENTIALITY AND NON- DISCLOSURE AGREEMENT

This Confidentiality and Non- Disclosure Agreement ("Agreement") dated this **24th day of April 2015**, effective from **24th day of April 2015,** is made by and between VEL TECH DR.RR & DR.SR TECHNICAL UNIVERSITY at No.42&60,Avadi-Vel TechRoad,Avadi,Chennai-600062. (hereinafter referred to as "VELTECH") of the One Part, And WABCO INDIA LIMITED, a company incorporated under the laws of India and having its registered office at Plot No. 3, 3rd Main Road, Ambattur Industrial Estate, Chennai – 600058 (hereinafter referred to as "WABCO", which expression shall unless it be repugnant to the context or meaning thereof shall mean and include its successors and permitted assigns) of the Other Part.

(hereinafter VELTECH, and WABCO shall be individually referred to as the "Party" and collectively as the "Parties")

WHEREAS WABCO is engaged in the business of manufacturing and selling of Vehicle Control and breaking Systems;

WABCO and VELTECH intend to develop a collaborative partnership to address the concerns of academic institutions and industry.

VELTECH approached WABCO for internship/project opportunities/Placement opportunities to its students/sponsoring employees for B.Tech & M.Tech Part Time Programmes/ Identify areas of Research in Contemporary Technology appropriate to respective WABCO manufactured Products, / Providing inputs to Curriculum Design to improve relevance to Industry and also requested delivery of guest lectures by WABCO personnel.

WABCO agreed to consider internships/project opportunities /Placement opportunities /sponsoring employees for B.Tech & M.Tech Part Time Programmes/ Identify areas of Research in Contemporary Technology appropriate to WABCO manufactured Products, / Providing inputs to Curriculum Design to improve relevance to Industry to VELTECH students on need basis and also willing to deliver guest lectures' at VELTECH subject to availability of experts from WABCO. WABCO is not under a mandatory obligation to provide internship/projects Placement opportunities /sponsoring employees for B.Tech & M.Tech Part Time Programmes/ Identify areas of Research in Contemporary Technology appropriate to respective WABCO manufactured Products, / Providing inputs to

Curriculum Design to improve relevance to Industry and deliver guest lectures at VELTECH.

WHEREAS during the process of internship/ project or any other opportunities at or with WABCO, VELTECH and its professors and students may come to know of certain information concerningWABCO, its Affiliate companiesand its products, customers and operations which may also be of a strategic, confidential or proprietary nature (hereinafter also referred to as the "Confidential Information");

AND WHEREAS VELTECH agrees that this information is confidential and valuable, and that this information constitutes special and unique proprietary rights and assets of the WABCO;

AND WHEREASVELTECH recognizes that careful protection and non-disclosure by it of the Confidential Information is of utmost importance to WABCO;

THEREFORE in consideration of the promises made herein, WABCO agrees to disclose and VELTECH agrees to receive certain confidential and proprietary information under the terms and conditions hereinafter appearing

1. **AUTHORIZED PURPOSE**. WABCO will disclose certain information that is confidential and proprietary in connection with Academia and Industry collaboration with Vel Tech. Under this collaboration, WABCO may consider internship/project opportunities/Identify areas of Research in Contemporary Technology appropriate to WABCO manufactured Products,/Providing inputs to Curriculum Design to improve relevance to Industry(the "Authorized Purpose").VELTECH shall use the Confidential Information for the Authorized Purpose only.

2. CONFIDENTIAL INFORMATION

2.1 **Definition:** Confidential Information shall mean any information and data which is relative to WABCO business affairs, policies, methods, services, customers or associates; and all record bearing media containing or disclosing such information and techniques which are disclosed pursuant to this Agreement. In addition to (i) Any business, technical or other non-public and proprietary information relating to WABCO that is disclosed by WABCO to VELTECH or acquired by VELTECH in the course of the Authorized

Purpose, regardless of the medium of conveyance, directly or indirectly, in oral, written, graphic, electronic, or any other form, or through inspection, review, or analysis and which is marked "confidential" or with other words of a similar nature, or is actually known by VELTECH (or from all the relevant circumstances should reasonably be understood by VELTECH)to be confidential or of a proprietary nature; (ii) Customer/Consumer Information, defined as (A) current, prospective or former customer of WABCO or any Affiliate type (For the purpose of this clause,"Affiliate" means WABCO HOLDING INC and/or any legal entity where WABCO Holding Inc directly or indirectly owns shareholdings.) whether the customer is an individual, business entity, governmental unit, or otherwise, (B) consumer of WABCO or any Affiliate, (C) nonpublic personal information of WABCO or any Affiliate regarding its customers or consumers (iii) any information relating to WABCO's, its Affiliates', or its suppliers' computer systems and architecture, security systems and procedures, or personnel (collectively, "WABCO Confidential Information").Information transmitted orally or visually shall be considered to be Confidential and proprietary Information provided such Confidential Information is first identified by the disclosing Party as being confidential, and is later reduced to written summary form, marked as being "confidential" or "proprietary" by the transmitting party, and transmitted to the recipient within thirty (30) days after such oral or visual transmission. During this thirty (30) day period, such oral or visual information so disclosed shall be provided the same protection as provided for the Confidential Information as set forth below.

1.3 **Ownership.** The Confidential Information shall be considered, as a valuable trade secret owned by WABCO. WABCO retains all right, title, and interest in the Confidential Information. No license to VELTECH, under any trademark, patent or copyright, or applications for same which are now or may thereafter be obtained by WABCO, is either granted or implied by the conveying of Confidential Information to VELTECH.

2. NONDISCLOSURE

2.1 Use of Confidential Information. VELTECH may only use the Confidential Information for the Authorized Purpose stated in Clause 1 hereinabove. VELTECH recognizes that this Agreement imposes an affirmative duty on VELTECH to hold such information in confidence and to protect it from dissemination to and use by, unauthorized parties. In the absence of WABCO prior written consent, VELTECH shall neither reproduce

nor disclose the Confidential Information to any third party except the Related Parties as provided in clause 2.2 hereinbelow.

2.2 Further Responsibility. VELTECH agrees to use the same degree of care to protect the confidentiality of the Confidential Information as it would exercise to protect its own trade secrets and information but in no case less than a reasonable degree of care. VELTECH will grant access to the Confidential Information only to its directors, officers, employees, affiliates, agents, advisors and VELTECHs ("Related Parties") who have a clear need to know, for Authorized Purpose of this Agreement and shall advise such Related Parties of the existence and terms of this Agreement and of the obligations of confidentiality herein. Each Party shall be responsible for the breach of the terms of this Agreement by such Party, or by its Related Parties.

2.3 Return of Confidential Information. Promptly following the request of WABCO, VELTECH will return to the, or certify in writing to WABCO as to the destruction of (without retaining any copy), all Confidential Information (and copies and extracts thereof) furnished to, or created by or on behalf of WABCO.

2.4 Exceptions. The foregoing notwithstanding, no information shall be considered Confidential Information if such information:

(a) are already known to or in the possession of VELTECH before execution of this Agreement, provided that the source of such information, to the knowledge of VELTECH after due inquiry, was not bound by an obligation of confidentiality with respect to such information

(b) are or become publicly known without breach of this Agreement or other obligations of non-disclosure by the VELTECH or its personnel;

(c) are obtained by the VELTECH from a third party who is not under a duty of confidentiality to WABCO;

(d) were independently developed by VELTECH and without the use of the Confidential Information of WABCO, as demonstrated by the competent proof of VELTECH or it; or

(e) if disclosure was required by law, rule or regulation or was in response to a valid order of a court or authorized agency of government or other legal process, provided that prior written notice is given to WABCO so that a protective order or other relief, if appropriate, may be sought by WABCO.

(f) WABCO agrees in writing are free of the restrictions set out in this Agreement.

2.5 Remedies. VELTECH recognize and acknowledge that Confidential Information is of a special, unique and extraordinary character to WABCO and that disclosure, misappropriation or unauthorized use of such Confidential Information by VELTECH may cause serious injury to WABCO. VELTECH expressly agrees, therefore, that WABCO, shall be entitled to seek injunctive and other equitable relief to prevent the breach, or the further breach, of any of the terms and provisions hereof. Provided however that, the VELTECH shall not be entitled to claim or recover from WABCO any losses, liabilities, damages, costs and expenses.

2.6 Public Statements. In addition to the limitations on the use and disclosures of Confidential Information set forth herein, VELTECH agrees that it shall neither issue or release or confirm any statement, to the general public, to the news media, or to any third party, except with the prior concurrence of WABCO, both as to the content and timing of any such issue or release or confirmation.

3. GENERAL

3.1 Term and Termination.

The terms of this Agreement is for a period of 5 years from the date of signing this Agreement. VELTECH will not: (i) disclose the Confidential Information of WABCO, except as permitted in this Agreement; (ii) copy or transmit the Confidential Information for any purpose other than the Authorized Purpose; or (iii) use the Confidential Information of WABCO, except as permitted herein, without the prior express written consent of WABCO.

(b) During the collaboration between Parties, Vel Tech and/or its students may work on projects/internships wherein WABCO and/or it's customer's proprietary information in different forms shall be shared to/ or accessed by Vel Tech and/or it's students. Veltech and/or its students shall return all WABCO and/or customer proprietary information to WABCO upon completion of the Project/Assignment.

(c) Either Party may terminate this Agreement upon written notice of thirty (30) days to the other Party. Further, duties of non-disclosure as set forth in Clause 2 hereinabove shall survive any expiration/termination of the Agreement from date of receipt of the Confidential Information.

3.2 No Obligation to Complete Transaction. Unless and until a final agreement with respect to a transaction involving the Parties has been executed and delivered, neither Party will be under any legal obligation of any kind whatsoever with respect to such a transaction by virtue of this Agreement except for the matters expressly agreed to herein.

3.3 No Conflicts. Each Party represents and warrants that its actions with respect to this Agreement do not conflict with any prior obligations to any third party. The Parties further agree not to disclose or to use on behalf of the other Party any Confidential Information belonging to any third party, unless sufficient written authorization from the third party is provided.

4. General Terms. This Agreement shall be binding upon and inure to the benefit of the Parties and their successors and assigns. The waiver or failure of either Party to exercise in any respect any right provided for in this Agreement shall not be deemed a waiver of any further right under this Agreement. If any provision of this Agreement is deemed or held by a court of competent jurisdiction, to be contrary to law or otherwise unenforceable, it shall be enforced to the extent legally permissible and as necessary to reflect the intent of the Parties and shall not affect the remaining provisions of this Agreement, which shall remain in full force and effect. This Agreement may only be amended by a writing executed by duly authorized representatives of both the Parties.

5. Jurisdiction : This Agreement shall be governed by and construedin accordance with the laws of India and the courts atChennai, India shall have exclusive jurisdiction.

6. Arbitration: In the event of any dispute or difference between the Parties arising out of or relating to or regarding the interpretation of this Agreement, or consequent on the termination of this Agreement, such dispute or difference shall be referred to a single Arbitrator mutually appointed by the both parties and arbitration shall be conducted in accordance with the Indian Arbitration and Conciliation, 1996. Such arbitration shall be conducted in Chennai, India. The Arbitration proceedings shall be governed by the law of India. English language shall be used in the arbitration proceedings. The arbitration award shall be final and binding on all the Parties.

7.Entire Agreement. This Agreement represents the entire agreement and understanding between the Parties with respect to the subject matter herein and supersedes all prior

agreements and understandings and writings of any kind, written or oral, express or implied, with respect to the subject matter hereof.

8.Counterparts: This Agreement may be executed in one or more counterparts, all of which are considered but one and the same agreement and become effective when one or more such counterparts have been signed by each of the parties and delivered to the other party.

IN WITNESS WHEREOF, the Parties have through their duly authorized representatives executed this Agreement the day and the year first hereinabove written.

For VEL TECH

Col.Prof.Dr.Vel.R. Rangarajan,
Founder-President ,
Vel Tech Dr. RR & Dr. SR Technical University
#42, Avadi-Vel Tech Road,
Avadi, Chennai-600 062,

Vel Tech Rangarajan Dr. Sagunthala R&D
Institute of Science and Technology,
(Vel Tech Dr.RR & Dr.SR Technical University
42&60, Avadi-Vel Tech Road, Avadi,
Chennai-600 062.

WITNESS:

Dr. P. SARASU
DIRECTOR R&D
VEL TECH Dr. RR & Dr. SR
TECHNICAL UNIVERSITY

For WABCO

Mr.V.Thiagarajan,
General Manager(TQM & Six Sigma)
WABCO INDIA LIMITED
Ambattur Industrial Estate,
Chennai-600058

WABCO INDIA LIMITED * CHENNAI 600 058

WITNESS:

T.R. NARASIMHAN
Sr. Manager - TQM & GG
WABCO INDIA

Vel Tech
Rangarajan Dr. Sagunthala R&D Institute of Science and Technology
(Deemed to be University Estd. u/s 3 of UGC Act, 1956)

Date: 12th Feb 2022

MOU signed with WABCO INDIA LIMITED

MOU Number	**MOU - 18**
Name of the Organization	**M/s. WABCO INDIA LIMITED**
Date of signing of MoU	**24.04.2015**
Date of MoU Renewal (If any)	
Next renewal due on	**23.04.2020**
Objectives of MoU	**Project for Final year students, GL, IPT**

Academic Year	No. of Students	Course	Duration (15 Hours)	Project/IPT/ CREDIT COURSE
2017 -18	25	B.TECH MECH	12.08.2017, 06.09.2017, 07.09.2017	CREDIT COURSE
2017 -18	13	B.TECH MECH	29.07.2017, 05.092017, 14.10.2017	CREDIT COURSE
2017 -18	25	B.TECH MECH	22.07.2017, 29.072017, 12.08.2017, 14.10.2017	CREDIT COURSE

Dr. P. Chandrakumar

Dean Industry Relations & TBI

MoU Coordinator

No.42, Avadi-Vel Tech Road, Vel Nagar,
Avadi, Chennai - 600 062, Tamil Nadu, India.
Landline : +91 44 2684 0262 / 2684 0605
Toll Free : 1800 212 7669
Email : registrar@veltech.edu.in
Website : www.veltech.edu.in

Ref No. L1/8000

Vel Tech

Rangarajan Dr. Sagunthala

R&D Institute of Science and Technology

(Deemed to be University Estd. u/s 3 of UGC Act, 1956)

WABCO INDIA LIMITED

MOU – 18

WABCO

ICC-23

ICC-23

1/2

Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction Engineering

Department of Mechanical Engineering

Credit Course on

"AIR BRAKE SYSTEM ENGINEERING"

by

Mr.V.THIAGARAJAN,

WABCO INDIA LIMITED,

Held on

12/08/17, 06/09/17 & 07/09/17

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Veltech Dr.RR & Dr.SR University
(Estd. u/s 3 of UGC Act. 1956)

School of Mechanical & Construction Engineering

Department of Mechanical Engineering

Credit Course on

"AIR BRAKE SYSTEM ENGINEERING"

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Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction Engineering
Department of Mechanical Engineering

INDEPENDENT LEARNING COURSE ON
"AIR BRAKE SYSTEM ENGINEERING"

Held on

12/08/17, 06/09/17 & 07/09/17

Table of Contents

Sl. No	TITLE
1	Acceptance by industry expert
2	Expert profile
3	Course syllabus
4	Approval letter
5	Course schedule
6	Student's name list
7	Student attendance
8	Student attendance percentage
9	Student Assessment marks
10	Student Assessment result
11	Photos
12	Expert Feedback
13	Student's Feedback
14	Certificate copy
15	Course Material – annexure I

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Fwd: Short presentation on Single credit course on Air Brake System Engineering - sec9.veltech@gmail.com - Gmail

7/2017

om: Thiagarajan -HR-WINC, V <thiagarajan.v@wabco-auto.com>
ate: Thu, Jul 13, 2017 at 3:21 PM
ubject: Short presentation on Single credit course on Air Brake System Engineering
o: S Balachandran <balachandran.s@wabco-auto.com>, "Industry Relations Office Veltech, Chennai" <dindoffice@veltechuniv.edu.in>

ear Both,

lease find attached the presentation on Single credit course on Air Brake System Engineering, to be discussed during tomorrow's meeting.

et us deliberate on this tomorrow.

est regards,

T

roprietary and confidential. It is for use by the addressee only. If you are not the addressee or if you received this email in error, please notify the sender and delete it and any attachments. All communications are subject to our Data Protection Policy that can be found at http://www.wabco-auto.com/footer/legal/data-protection-policy/ . By communicating with us via e-mail, you agree to the policy. WABCO does not guarantee that this email has not been intercepted, amended, or is virus-free. No liability is accepted for viruses and it is your responsibility to scan any attachments. Technical data and/or information provided in this email or any attachment may be subject to U.S. export control laws. Export, re-export, diversion or disclosure contrary to U.S. law is prohibited

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Expert Profile



Name:	V.THIAGARAJAN (Contact Phone No. +91 98409 35685)
Qualification:	B.E (Mechanical Engineering), Madurai Kamaraj University, 1982 M.Tech (Mechanical Engineering), Indian Institute of Technology, Madras, 1984
Designation:	General Manager (TQM & Six Sigma)
Experience:	Manager (Design) – Hindustan Aeronautics Limited, Bangalore – 1983 to 1995 Member (R&D) – Sundaram Clayton Limited, Chennai - 1995 to 2005 Currently General Manager (TQM & Six Sigma) – WABCO INDIA Limited.

Nature of job:

I. Member (R&D):

- Design and development of new products as a member of cross-functional team
- Solving problems in current products such as assembly rework, customer end line rejection
- Reliability analysis of current products to enhance product warranty

II. General Manager (TQM & HRD):

- Recruitment of executives and managers as per the approved organisation chart
- Consolidation of training needs companywide and imparting training as per annual training calendar
- Facilitation of total employee involvement through employee suggestions, quality control circle (QCC), supervisory improvement team (SIT) and cross functional team (CFT) projects
- Participation in annual policy planning process and monitoring interfacing of all department objectives and action plans to achieve Divisional objectives.
- Nurturing and sustaining TQM practices of the organization with the help of TQC coordinators

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- Facilitation of total employee involvement through employee suggestions, quality control circle (QCC), supervisory improvement team (SIT) and cross functional team (CFT) projects
- Participation in annual policy planning process and monitoring interfacing of all department objectives and action plans to achieve Divisional objectives.
- Nurturing and sustaining TQM practices of the organization with the help of TQC coordinators

Training Undergone:

- Workshop on reliability concepts, India
- Statistical methods for reliability data, India
- Mid America Truck show and exposition, USA
- JUSE TQM Seminar, Japan
- Lean Six Sigma convention of WABCO companies at Malta, Europe
- HR training programme by Michigan School of Business
- Value Stream Standardization training program at WABCO, China
- Measuring HR, XLRI programme
- Quick resolution Six Sigma, Yellow belt certification
- Six Sigma green belt certification
- WABCO Leadership meeting and convention at Spain, Europe

Training Faculty:

As a faculty trained many engineers in the plant

Topics – Brake system engineering, Product function and testing, Problem solving techniques using 7 QC tools, Design of experiments, Statistical process control, Six Sigma awareness, TQM concepts, Policy Management, Total Employee Involvement.

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Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

Department of Mechanical Engineering

One credit course on Air Brake System Engineering

on 12/08/17, 06/09/17 & 07/09/17

By

Mr.V.THIAGARAJAN

General Manager, Wabco India Private Limited

Course Syllabus

Contents:

LECTURE

- TYPES OF BRAKE SYSTEM
- INTRODUCTION TO AIR BRAKE SYSTEM
- LAYOUT OF AIR BRAKE SYSTEM
- COMPONENTTS OF AIR BRAKE SYSTEM
- COMERCIAL VEHICLE BRAKE SYSTEM OVERVIEW
- ADVANCE BRAKE SYSTEMS
- ANTI LOCK BRAKING SYSTEM

LABORATORY

- ACTUAL PRODUCTS DEMONSTRATION
- AIR BRAKE SYSTEM WITH VEHICLE LAYOUT
- ANTI LOCK BRAKE SYTEM DEMONSTATION
- CONVENTIONAL BRAKE SYSTEM LAYOUT

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Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction Engineering
Department of Mechanical Engineering

Submitted for Approval

20 November 2017

Sir,

The Department of Mechanical Engineering has organized a 15 hrs course on "Air Brake System Engineering" for II Year and III year Mechanical Engineering Students during the following days, 12/08/17, 06/09/17 and 07/09/17. The course code is assigned as 1157ME909. Mr.V.Thiagarajan, General Manager, WABCO India Limited was the resource person. The course was taught 5hours on the respective dates.

Initially 30 students have registered for the specialised course. But only the following 25 students were regular and secured more than 75% attendance. These students cleared the final examination. One final examination was conducted and evaluated by the resource person. The attendance particulars, marks secured by the students in the final examination are given in Annexure A

The course syllabus, daily schedule, final examination question paper along with few students' feedback is enclosed herewith.

This course may be considered as course offered under the Section 7.2.8 Higher Learning Institute Interaction and the above students are eligible for one credit under the VTU R15 Section 7.2.8.3.

Approval is kindly requested for

1. To accept the above course under the specialized course category as per the VTUR15
2. To award one credits to the 25 students under the Specialized course category under VTU R15 Section 7.2.8.3.

Submitted for approval please

(D L Belgin Paul)
Course Coordinator

(Dr A T Ravichandran)
HoD Mechanical

24.11

Prof. Dr. techn. Koteswara Rao Anne
Director Academics
Veltech Dr. RR & Dr. SR University
(Estd. u/s 3 of UGC Act, 1956)

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Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction Engineering

Department of Mechanical Engineering

INDEPENDENT LEARNING COURSE ON

"AIR BRAKE SYSTEM ENGINEERING"

By

Mr. V.THIAGARAJAN, WABCO INDIA LIMITED

Held on

12/8/17, 6/9/17 & 7/9/17

Course Schedule

Date	Topic
12/7/17	**LECTURE** • TYPES OF BRAKE SYSTEM • INTRODUCTION TO AIR BRAKE SYSTEM • LAYOUT OF AIR BRAKE SYSTEM • COMPONENTTS OF AIR BRAKE SYSTEM • COMERCIAL VEHICLE BRAKE SYSTEM OVERVIEW • ADVANCE BRAKE SYSTEMS • ANTI LOCK BRAKING SYSTEM
5/09/17	**LABORATORY** • ACTUAL PRODUCTS DEMONSTRATION • AIR BRAKE SYSTEM WITH VEHICLE LAYOUT • ANTI LOCK BRAKE SYTEM DEMONSTATION • CONVENTIONAL BRAKE SYSTEM LAYOUT
14/10/17	**ASSESSMENT PHASE** • IDENTIFYING THE BRAKE COMPONENTS • CONCEPT TEST ON BRAKE SYSTEM • ASSIGNMENT EVALUATION • TEST

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Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction Engineering

Department of Mechanical Engineering

The following students have been shortlisted to attend the independent learning course on "**AIR BRAKE SYSTEM ENGINEERING**" to be held on 12/08/17, 06/09/17 & 07/09/17

S.NO	VTU NO	NAME
1	6072	S.SAI ASHWIN
2	5935	R.VAISAKH
3	6255	R.PRAMODH
4	5887	RAMANUJA SREAUS R.S
5	6105	SARTHAK KUMAR.B
6	6112	ROSHAN RAJ.R
7	6116	RAHUL RAJ.R
8	6384	PURUSHOTHAM
9	6258	SELVARAJAN.R
10	6063	SELVIN RUFUS
11	6514	VENKATA MUNI.A
12	6203	MOHAMMAD ABID
13	6542	ARINDAM DUTTU
14	6676	N.VIVEK
15	6552	AZHAN AHMED
16	6583	VINODH KUMAR.A.P

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17	5903	DINESH.K
18	6502	D.DEEPAK KUMAR
19	6631	V.ARAVIND
20	6306	K.AKASH
21	6528	P.BHARATH KUMAR REDDY
22	6252	P.DASARADHA RAM
23	6430	E.BHANU PRAKASH
24	6449	K.S.SAI CHARAN TEJ
25	6296	L.VENKATA KRISHNA
26	6076	P.VENKATA SIVA REDDY
27	6516	K.SUSHANTH KUMAR
28	6008	M.SAI BHAVANI SRAVAN
29	5902	K.RAVI TEJA
30	6551	N.HARSHAVARDHAN REDDY

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COURSE FACULTY : Mr.Thiyagarajan,HR wabco India Private Ltd.,Chennai

VENUE:

SL.NO	VTU NO	NAME	YEAR	SIGNATURE					
				12.8.2017		6/9/17		7/9/17	
				F.N	A.N	F.N	A.N	F.N	A.N
1	6072	S.SAI ASHWIN	III						
2	5935	R.VAISAKH	III						
3	6255	R.PRAMODH	III						
4	5887	RAMANUJA SREAUS R.S	III						
5	6105	SARTHAK KUMAR.B	III						
6	6112	ROSHAN RAJ.R	III						
7	6116	RAHUL RAJ.R	III						
8	6384	PURUSHOTHAM	III						
9	6258	SELVARAJAN.R	III						
10	6063	SELVIN RUFUS	III						
11	6514	VENKATA MUNI.A	III						
12	6203	MOHAMMAD ABID	III			AB	AB	AB	AB
13	6542	ARINDAM DUTTU	III			AB	AB	AB	AB
14	6676	N.VIVEK	III			AB	AB	AB	AB
15	6552	AZHAN AHMED	III	AB	AB	AB	AB	AB	AB
16	6583	VINODH KUMAR.A.P	III						
17	5903	DINESH.K	III						
18	6502	D.DEEPAK KUMAR	III						
19	6631	V.ARAVIND	III						
20	6306	K.AKASH	III						
21	6528	P.BHARATH KUMAR REDDY	III						
22	6252	P.DASARADHA RAM	III						
23	6430	E.BHANU PRAKASH	III	AB	AB	AB	AB	AB	AB
24	6449	K.S.SAI CHARAN TEJ	III						
25	6296	L.VENKATA KRISHNA	III						
26	6076	P.VENKATA SIVA REDDY	III						
27	6516	K.SUSHANTH KUMAR	III						
28	6008	M.SAI BHAVANI SRAVAN	III						
29	5902	K.RAVI TEJA	III						
30	6551	N.HARSHAVARDHAN REDDY	III						
		No.of Absent:		02	02	05	05	05	05
		Faculty Signature :							

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COURSE FACULTY : Mr.Thiyagarajan,HR wabco India Private Ltd.,Chennai

VENUE:

SL. NO	VTU NO	NAME	YEAR	SIGNATURE					
				12.8.2017		6/9/17		7/9/17	
				F.N	A.N	F.N	A.N	F.N	A.N
1	6072	S.SAI ASHWIN	III						
2	5935	R.VAISAKH	III						
3	6255	R.PRAMODH	III						
4	5887	RAMANUJA SREAUS R.S	III						
5	6105	SARTHAK KUMAR.B	III						
6	6112	ROSHAN RAJ.R	III						
7	6116	RAHUL RAJ.R	III						
8	6384	PURUSHOTHAM	III						
9	6258	SELVARAJAN.R	III						
10	6063	SELVIN RUFUS	III						
11	6514	VENKATA MUNI.A	III						
12	6203	MOHAMMAD ABID	III						
13	6542	ARINDAM DUTTU	III			AB	AB	AB	AB
14	6676	N.VIVEK	III			AB	AB	AB	AB
15	6552	AZHAN AHMED	III			AB	AB	AB	AB
16	6583	VINODH KUMAR.A.P	III	AB	AB	AB	AB	AB	AB
17	5903	DINESH.K	III						
18	6502	D.DEEPAK KUMAR	III						
19	6631	V.ARAVIND	III						
20	6306	K.AKASH	III						
21	6528	P.BHARATH KUMAR REDDY	III						
22	6252	P.DASARADHA RAM	III						
23	6430	E.BHANU PRAKASH	III						
24	6449	K.S.SAI CHARAN TEJ	III	AB	AB	AB	AB	AB	AB
25	6296	L.VENKATA KRISHNA	III						
26	6076	P.VENKATA SIVA REDDY	III						
27	6516	K.SUSHANTH KUMAR	III						
28	6008	M.SAI BHAVANI SRAVAN	III						
29	5902	K.RAVI TEJA	III						
30	6551	N.HARSHAVARDHAN REDDY	III						
		No.of Absent:		02	02	05	05	05	05
		Faculty Signature:							

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Veltech Dr.RR & Dr.SR University
(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction Engineering
Department of Mechanical Engineering

Students Attendance percentage

S.NO	Year	VTU Id	Name	Attendance Percentage
1	III	6072	S.SAI ASHWIN	100
2	III	5935	R.VAISAKH	100
3	III	6255	R.PRAMODH	100
4	III	5887	RAMANUJA SREAUS R.S	100
5	III	6105	SARTHAK KUMAR.B	100
6	III	6112	ROSHAN RAJ.R	100
7	III	6116	RAHUL RAJ.R	100
8	III	6384	PURUSHOTHAM	100
9	III	6258	SELVARAJAN.R	100
10	III	6063	SELVIN RUFUS	100
11	III	6514	VENKATA MUNI.A	100
12	III	6203	MOHAMMAD ABID	33
13	III	6542	ARINDAM DUTTU	33
14	III	6676	N.VIVEK	33
15	III	6552	AZHAN AHMED	0
16	III	6583	VINODH KUMAR.A.P	100
17	III	5903	DINESH.K	100
18	III	6502	D.DEEPAK KUMAR	100
19	III	6631	V.ARAVIND	100
20	III	6306	K.AKASH	100
21	III	6528	P.BHARATH KUMAR REDDY	100
22	III	6252	P.DASARADHA RAM	100
23	III	6430	E.BHANU PRAKASH	0
24	III	6449	K.S.SAI CHARAN TEJ	100
25	III	6296	L.VENKATA KRISHNA	100
26	III	6076	P.VENKATA SIVA REDDY	100
27	III	6516	K.SUSHANTH KUMAR	100
28	III	6008	M.SAI BHAVANI SRAVAN	100
29	III	5902	K.RAVI TEJA	100
30	III	6551	N.HARSHAVARDHAN REDDY	100

Dr. A. Harichandran
Head of the Department
Mechanical Engineering
Veltech Dr.RR & Dr.SR University

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Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction
Department of Mechanical Engineering
One Credit Course on "Air Brake System Engineering"
Attendance percentage and consolidated marks

S.NO	Year	VTU Id	Name	Attendance Percentage	Total Marks			
					Test Marks(30)	Assignment Marks(10)	TOTAL MARKS(100)	GRADE
1	III	6072	S.SAI ASHWIN	100	26	8	85	A
2	III	5935	R.VAISAKH	100	21	6.5	69	C
3	III	6255	R.PRAMODH	100	24	7	78	B
4	III	5887	RAMANUJA SREAUS R.S	100	26	8	85	A
5	III	6105	SARTHAK KUMAR.B	100	24	8.5	81	A
6	III	6112	ROSHAN RAJ.R	100	25	7.5	81	A
7	III	6116	RAHUL RAJ.R	100	25	7.5	81	A
8	III	6384	PURUSHOTHAM	100	25	7.5	81	A
9	III	6258	SELVARAJAN.R	100	19	8	68	C
10	III	6063	SELVIN RUFUS	100	25	6.5	79	B
11	III	6514	VENKATA MUNI.A	100	19	7	65	C
12	III	6203	MOHAMMAD ABID	33	AB	0	0	RA
13	III	6542	ARINDAM DUTTU	33	AB	0	0	RA
14	III	6676	N.VIVEK	33	AB	0	0	RA
15	III	6552	AZHAN AHMED	0	AB	0	0	RA
16	III	6583	VINODH KUMAR.A.P	100	19	6	63	C
17	III	5903	DINESH.K	100	22	7	73	B
18	III	6502	D.DEEPAK KUMAR	100	19	6	63	C
19	III	6631	V.ARAVIND	100	23	8.5	79	B
20	III	6306	K.AKASH	100	16	6	55	D
21	III	6528	P.BHARATH KUMAR REDDY	100	27	9.5	91	A
22	III	6252	P.DASARADHA RAM	100	20	8	70	C
23	III	6430	E.BHANU PRAKASH	0	AB	0	0	RA
24	III	6449	K.S.SAI CHARAN TEJ	100	25	9	85	A
25	III	6296	L.VENKATA KRISHNA	100	27	8	88	A
26	III	6076	P.VENKATA SIVA REDDY	100	25	8	83	A
27	III	6516	K.SUSHANTH KUMAR	100	19	8.5	69	C
28	III	6008	M.SAI BHAVANI SRAVAN	100	24	8	80	B
29	III	5902	K.RAVI TEJA	100	21	7	70	C
30	III	6551	N.HARSHAVARDHAN REDDY	100	26	9	88	A

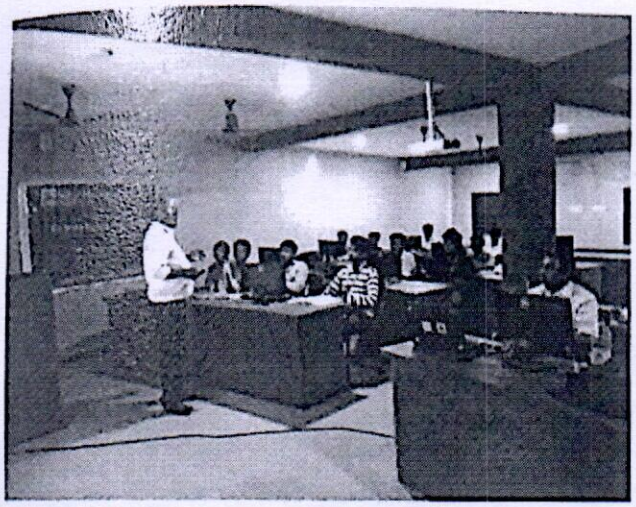
Course In-charge

HOD Mechanical 24/11

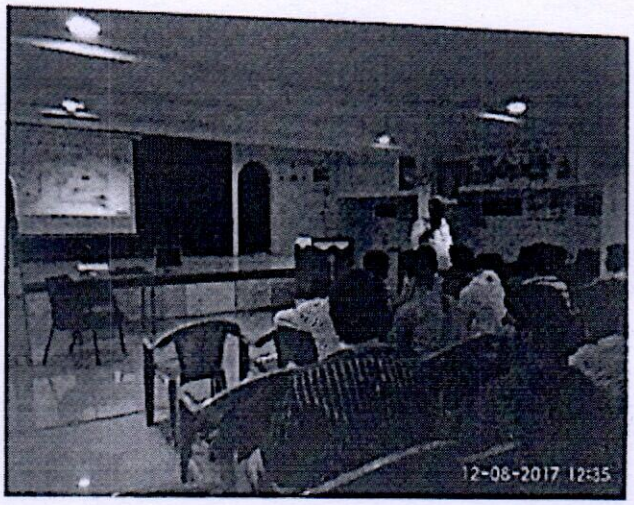
Dr. A.T. [illegible]
Head of the Department
Mechanical Engg.
Veltech Dr.RR & Dr.SR University

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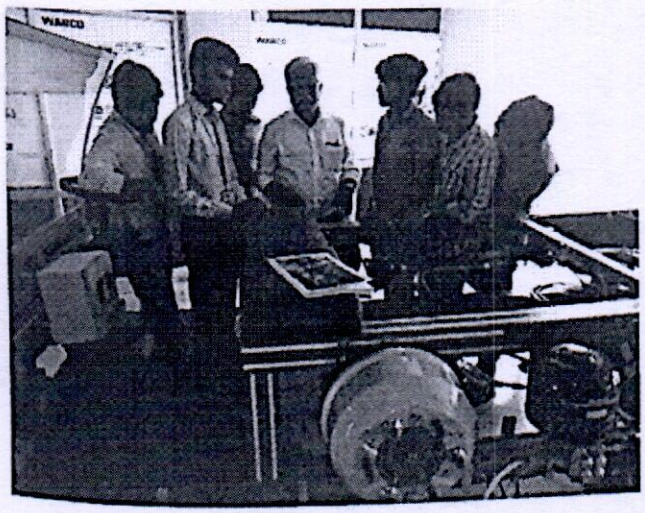
Photos



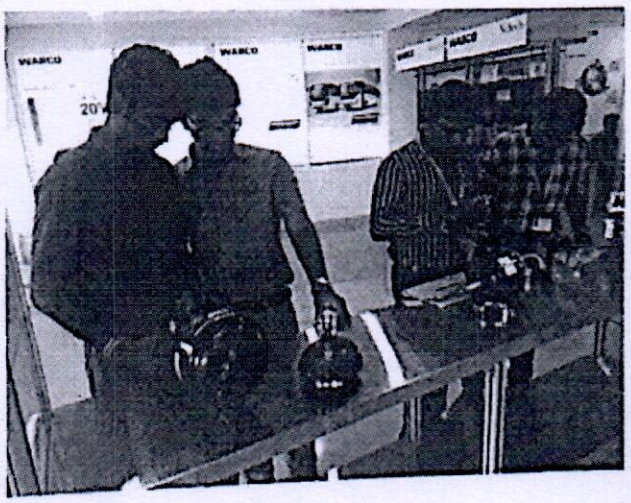
EXPERT INTERACTION WITH STUDENTS



EXPERT EXPLAINING THE LAYOUT OF AIR BRAKE SYSTEM



LAB SESSION-EXPERT DEMONSTRATING LAYOUT OF COMMERCIAL VEHICLE WITH AIR BRAKE



LAB SESSION-PRODUCT IDENTIFICATION BY STUDENTS

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Credit Course Expert Feedback Form

Course Name: AIR BRAKE SYSTEM ENGINEERING

Industry: WABCO INDIA LIMITED

School: SOMC **Dept:MECHANICAL**

S.No	Description	4 Very Good	3 Good	2 Fair	1 Poor
1	Lecture Hall Arrangements	✓			
2	Laboratory Facilities		✓		
3	Hospitality	✓			
4	Travel Arrangements	✓			
5	Interactions by the students	✓			
6	Overall Satisfaction	✓			

Any other Comments:

Department of Management Staffs are very much appreciable.

Name: S. ULAGANATHAN

Designation: SENIOR CONSULTANT

Signature

S. ULAGANATHAN

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Students Feedback Form

Course Name: AIR BRAKE SYSTEM ENGINEERING

Industry: WABCO INDIA LIMITED

School: SOMC Dept: MECHANICAL Date: 07th September 2017

Q1. The training sessions were relevant to my needs?

✓ Yes ○ No

Q2. Experts were well prepared?

✓ Yes ○ No

Q3. The exercises helped me to learn the material?

✓ Yes ○ No

Q4. There was enough time to cover all materials?

✓ Yes ○ No

Q5. The training facilities were adequate

✓ Yes ○ No

Q6. The Course notes / slides were very useful

✓ Yes ○ No

Q7. I would recommend this training course to a colleague

✓ Yes ○ No

Any other Suggestions:

The training went well and good

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(Estd. u/s 3 of UGC Act, 1956)

Certificate of Completion

Mr./Ms. R.SELVARAJAN

(VTU 6258) belongs to 2015 - 2016 Batch pursuing B.Tech.

in Mechanical Engineering at

Veltech Dr.RR & Dr.SR University, Chennai

has successfully completed the 15 hours Specialized Course on

Air Brake System Engineering.

Conducted by

WABCO India Limited

organized by the

Department of Mechanical Engineering

Topics Covered

- Basic Vehicle Braking Dynamics, Parking Brake, Basic Air Brake Actuation System – S Cam Full Air
- Components of Air Brake Actuation System – Construction, Working Principles
- Auxiliary Braking System, System for Tractor / Trailer – Products and Working Principles
- Advances in Air Brake System - Products and Working principles
- Maintenance and Service practices of Air Brake System

Mr.V.Thiagarajan
General Manager
TQM & Six Sigma
WABCO India Limited

Dr.Ravichandran.A.T
HOD – Mechanical / Dean (I/c) - SOMC

Prof. Dr. Techn. Koteswara Rao Anne
Director Academics

Prof. Dr.Beela Satyanarayana
Vice Chancellor

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ICC - 21 ICC-21

1/2

Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction Engineering

Department of Mechanical Engineering

Credit Course on

"PROBLEM SOLVING USING SHAININ TECHNIQUE"

by

Mr. M. SENTHIL KUMAR,

PRODUCT DEVELOPMENT,

WABCO INDIA LIMITED,

Held on

29/07/17, 5/09/17, 14/10/17

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Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction Engineering

Department of Mechanical Engineering

Credit Course on

"PROBLEM SOLVING USING SHAININ TECHNIQUE"

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Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction Engineering
Department of Mechanical Engineering

One Credit Course on "Problem solving using Shainin Technique"
By

Mr. M.Senthil Kumar
Product Development, Wabco India Limited
29/07/2017, 05/09/2017, 14/10/2017

TABLE OF CONTENTS

Sl. No	TITLE
1	Acceptance by industry expert
2	Expert profile
3	Course syllabus
4	Approval letter
5	Course schedule
6	Student's name list
7	Student attendance
8	Student attendance percentage, marks and result
9	Photos
10	Expert Feedback
11	Student's Feedback
12	Honorarium
13	Certificate copy
14	Course Material – annexure I

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From: Senthil -PD-WINC, kumar M <senthilkumar.m@wabco-auto.com>
Date: Mon, Aug 28, 2017 at 12:46 PM
Subject: Re: Schedule for the remaining portion of Credit course on Shainin Technique" - Regarding .
To: "Industry Relations Office Veltech, Chennai" <dindoffice@veltechuniv.edu.in>

Dear All,

Thanks for your mail, self will take care.

Thanks,

MSK.

On Mon, Aug 28, 2017 at 12:42 PM, Industry Relations Office Veltech, Chennai <dindoffice@veltechuniv.edu.in> wrote:

> Dear Sir,
> As discussed we are scheduling the classes as under:Tuesday 5th Sep 9.45 AM to 3.45 AM and on Saturday 9th Sep same timing. .Request make it convenient.
> **Best Regards,**
>
> **Prof. C.S.SIVAKUMAR**
> Adviser Industry Relations & Professor-Mech Dept,
> **Veltech Dr. RR & Dr. SR University.**
> **Mobile: 09445049402**
> Email ID: dindoffice@veltechuniv.edu.in
> Website:http://www.veltechuniv.edu.in
> **Best Regards,**
>
> **Prof. C.S.SIVAKUMAR**
> Adviser Industry Relations & Professor-Mech Dept,
> **Veltech Dr. RR & Dr. SR University.**
> **Mobile: 09445049402**
> Email ID: dindoffice@veltechuniv.edu.in
> Website:http://www.veltechuniv.edu.in

---------- Forwarded message ----------
From: Senthil -PD-WINC, kumar M <senthilkumar.m@wabco-auto.com>
Date: Fri, Jul 21, 2017 at 8:50 AM
Subject: Re: Credit course on Shainin Technique" - Regarding .
To: "Industry Relations Office Veltech, Chennai" <dindoffice@veltechuniv.edu.in>

Dear Sir,

Pl. find attached herewith...

- my profile
- my course details *"Problem Solving using Shainin Technique (Six Sigma Methodology)"*

Thanks,

MSK.

On Thu, Jul 20, 2017 at 9:35 AM, Industry Relations Office Veltech, Chennai <dindoffice@veltechuniv.edu.in> wrote:

> Dear Sir,
> Greetings from Veltech University!!
> We request you to commence the subject credit course from 22nd July as already discussed.
> Request you to send your bio data/profile for the benefit of students immediately.
> Request also send the PPT /Write up for the first session of 22nd July. .
> First sesion will be of
> 5 hours (9.45 to 12.45 and 1.45 to 3.45 on 22nd july.,totaling 5 hours)
>
> Request you to come by your own transport.We shall reimburse Rs 1250 for to and fro.Honororium will be paid at the end of the completion of 15 hours lectures ie on completion of 3 to 4 sessions.
> Request arrange to send the profile and the PPT/Write up for students.
> Please Confirm.
> With best Regards.
> **Prof. C.S.SIVAKUMAR**
> **Technical Secretary to Founder President,**
> Dynamic Development Department (DDD)
> **Veltech Dr. RR & Dr. SR University.**
> **Mobile: 09445049402**
> Email ID: dindoffice@veltechuniv.edu.in
> Website:http://www.veltechuniv.edu.in

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2017

---------- Forwarded message ----------
From: Industry Relations Office Veltech, Chennai <dindoffice@veltechuniv.edu.in>
Date: 17 July 2017 at 13:31
Subject: Schedule for Problem Solving using Shainin Technique" - Regarding .
To: senthilkumar.m@wabco-auto.com
Cc: "Wohltmann, Dirk" <dirk.wohltmann@wabco-auto.com>

Dear Sir,
As discussed we are going ahead with the following schedule of guest lecture hours for the one credit course:
22nd July Saturday 5hours
29th July Saturday 5hours
9th Sep Saturday 5hours.
Kindly make it convenient.
With best Regards.

Prof. C.S.SIVAKUMAR
Technical Secretary to Founder President,
Dynamic Development Department (DDD)
Veltech Dr. RR & Dr. SR University.
Mobile: 09445049402
Email ID: dindoffice@veltechuniv.edu.in
Website:http://www.veltechuniv.edu.in

---------- Forwarded message ----------
From: Technical Secretary to Chancellor Sivakumar <sec11.veltech@gmail.com>
Date: 11 July 2017 at 15:01
Subject: Problem Solving using Shainin Technique"Fwd: Expert lectures from industry experts - Regarding .
To: "Industry Relations Office Veltech, Chennai" <dindoffice@veltechuniv.edu.in>

mail to: senthilkumar.m@wabco-auto.com
copy to: dirk.wohltmann@wabco-auto.com
Dear Sir,
Greetings from Veltech University!!!.
This has reference to the single credit course for Veltech students which is good for the students to get exposed to. We propose generally that the 15 hours of lectures be taken on any 5 days out of the following dates (Timing 9 A.M to12.PM).However on the days when unit test/mid term test/Practicals for students clash with these dates shown in red , we shall request for change in timing to 10am/11 am to 2.00 pm/3pm including break for lunch between 12 to 1pm on these dates.

1. 21ST July Friday
2. 22nd July Sat
3. 28th July Fri
4. 29th July Sat
5. 11th Aug Fri
6. 12th Aug Sat
7. 25th Aug Fri
8. 26th Aug Sat
9. 8thSep Fri
10. 9th Sep Sat

Your convenient dates will help us in planning the schedule of conduct of single credit course .
With best regards.
Best Regards,

Prof. C.S.SIVAKUMAR
Technical Secretary to Founder President,
Dynamic Development Department (DDD)
Veltech Dr. RR & Dr. SR University.
Mobile: 09445049402
Email ID: dindoffice@veltechuniv.edu.in
Website:http://www.veltechuniv.edu.in
Best Regards,

Prof. C.S.SIVAKUMAR
Technical Secretary to Founder President,
Dynamic Development Department (DDD)
Veltech Dr. RR & Dr. SR University.

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Email ID: dindoffice@veltechuniv.edu.in
Website:http://www.veltechuniv.edu.in

---------- Forwarded message ----------
From: Technical Secretary to Chancellor Sivakumar <sec11.veltech@gmail.com>
Date: 10 July 2017 at 15:24
Subject: Problem Solving using Shainin Technique"Fwd: Expert lectures from industry experts - Regarding .
To: Technical Secretary to Chancellor Sivakumar <sec11.veltech@gmail.com>

Best Regards,

Prof. C.S.SIVAKUMAR
Technical Secretary to Founder President,
Dynamic Development Department (DDD)
Veltech Dr. RR & Dr. SR University.
Mobile: 09445049402
Email ID: dindoffice@veltechuniv.edu.in
Website:http://www.veltechuniv.edu.in

---------- Forwarded message ----------
From: Industry Relations Office Veltech, Chennai <dindoffice@veltechuniv.edu.in>
Date: 7 July 2017 at 14:52
Subject: Fwd: Expert lectures from industry experts - Regarding .
To: SEC11.VELTECH@gmail.com
Cc: Director Industry Relations <DIND@veltechuniv.edu.in>

---------- Forwarded message ----------
From: Senthil -PD-WINC, kumar M <senthilkumar.m@wabco-auto.com>
Date: Fri, Jul 7, 2017 at 2:42 PM
Subject: Re: Expert lectures from industry experts - Regarding .
To: "Industry Relations Office Veltech, Chennai" <dindoffice@veltechuniv.edu.in>
Cc: "Wohltmann, Dirk" <dirk.wohltmann@wabco-auto.com>

Dear Sir,

I can provide week end lecture on the following topics, if you find this is useful for your students.

"Problem Solving using Shainin Technique"

Thanks,

MSK.

On Thu, Apr 13, 2017 at 3:39 PM, Industry Relations Office Veltech, Chennai <dindoffice@veltechuniv.edu.in> wrote:

Dear Sir,

Greetings from Veltech Dr.RR & Dr.SR.University !!!

You are aware that Guest Lectures by experts from Industries are arranged by Universities to expose the students to the ever changing technology developments and the best practices in modern industries.

It is our experience that these guest lecturers of two to three hours can only introduce the topic and give a general outlay but no doubt it generates a lot of interest among the students to know more on such topics taken by Industry experts. It is our endeavor to provide more exposure on these topics and encourage the students to specialize in that topic to the level he is useful and employable in similar industries.

Considering the constraint that availability of Industry experts vary depending on their schedule of work and the time they can spare, we propose to request Industry experts to give Guest Lecture according to the time that can be spared by them under the following 3 categories :

- Industry experts delivering one credit course of 15 hours during the ensuing semester (either on two or three Saturday's or Saturday Sunday continuously).The ensuing semester will start in 1st week of July 2017 and will end in Second week of Dec 2017.
- Industry experts delivering the Lecture to cover one unit (9 hours) or two Units (18 hours of one particular course as in the Academic syllabus (during the ensuing period of one semester).
- Industry experts delivering Guest Lecture for 3 hours.

their own area of specialization for such courses. This will also help imparting the expectations make the students to improve their technical skills in a variety of to Industry experts.

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We request you to give your expert advice on this by email and give your convenient date and time to further discuss on this subject.

With best Regards.

C.S.SIVAKUMAR,
Professor&Technical Secretary to Founder President,
Dynamic Development Department (DDD)
Vel Tech Dr. RR & Dr. SR Technical University.
Phone: 044 26841622 Fax: 044 26840605 **Mobile:09445049402**



Industry Relations Office
Veltech Dr.RR & Dr.SR University
400 feet Outer Ring Road, Avadi, Chennai-600 062, Tamil Nadu, India.
t: 044 2684 0605 | w: www.veltechuniv.edu.in | e: dindoffice@veltechuniv.edu.in



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Expert Profile

Brief introduction about Mr. M. SenthilKumar



Professional Synopsis

An Engineering Professional with around **23 years** experience and proven track record in **Product Development, Test Center , Application Engineering & Sustaining Engineering,** Project Management, New Product Development, , Product Testing, Prototype development , vendor development, Field/ Aftermarket/STU/Dealer support, End customer interaction during New product development and implementation, Closely working with Business development/Program Management for product promotion and technology day at Customer end & Reverse Engineering Projects in Automobile ,Tractor & Construction equipment Industries.

Joined in **WABCO INDIA Limited Chennai, Heading Test Center Since April-2015.**

Core Competencies include:

- **Product Validation**	**Test Center Set up**	**- Test rig Development**
- Field Trail	- Retro Fitment Projects	- 6 Sigma
- Sustaining Engineering	-Application Engineering	- Business Development
- Field Service support	- New product Development	- Key Account Management - VAVE

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Major Achievements

- First Time Self successfully developed the First fully indigenous Hydrostatic Steering Control Unit by Reverse Engineering route in India. This was announced as a breakthrough in Rane Madras Ltd.

- First Time Self Successfully Developed Torque Generator Steering System for Indian Agriculture Tractor application.

- Global Standard Test Center transferred developed and Supported the entire product validation requirement at Spicer India Ltd.

- Green Belt certification in Six Sigma by applying AHP and QFD tools at Eaton India Pvt. Ltd.

- Black Belt Level-1 in Six Sigma by applying shainin technique Tools to solve Dome Weld crack issue at Meritor India.

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Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

Department of Mechanical Engineering

One credit course on Problem solving using Shainin Technique

on 29/07/17, 5/9/17 & 14/10/17

By

Mr.M.Senthil Kumar

Product Development, Wabco India Private Limited

Course Syllabus

Contents:

- **INTRODUCTION TO SIX SIGMA**

1. DEFINE PHASE
2. MEASURE PHASE
3. ANALYZE PHASE
4. IMPROVE PHASE
5. CONTROL PHASE
6. PROBLEM DEFINITION
7. CATEGORIZING THE PROBLEMS
8. METHOD OF SOLVING
9. GO GEMBA

DEFINE PHASE

1.SUSPECTED SOURCE OF VARIATION
2. PAIED COMPARISON
3. PRODUCT/PROCESS SEARCH
4. COMPONENT SEARCH
5. MODIFIED COMPONENT SEARCH
6. MULTIVARI ANALYSIS
7. CONCENTERATION CHARTS
8. R&R STUDY
9. INSTRUMENT CALIBRATION

CASE STUDY

1. DIFFERENT TYPE OF PROBLEM
2. SOFT SKILL

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(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction Engineering

Department of Mechanical Engineering

Ref : VTU/DoME/Specilized courses/2017 – 18

Date: 8 July 2017

Submitted for Approval

Sir,

The Department of Mechanical Engineering offers the following One/Two credit course for the students of III Year Mechanical Engineering under Regulation VTU R 15 Section 7.2.8.3. These courses are offered by industry experts.

S. No	Course Name	Expert Name	Organization	Date(s)	No. of Credits	Max no of seats
1	Welding Technology - 15 Hrs	V.P.Balaji Sr. Manager R&D	WABCO India Limited	22 & 29.07.2017 12.08.2017 & 09.09.2017	One	30
2	Gear Cutting tools, basics, Design, Mfg, application & Development - 15 hrs	Mr. Rajagopalan GM (Rtd.) & Mr. Veera Ragavan Manager (Rtd.)	ADDISONS & CO. LTD	22.07.2017 29.07.2017 12.08.2017 or 26.08.2017	One	30
3	Wind Energy Technology – 15 Hrs	R.Kumaravel AVP & Head – Engg. & Develop	Regen Power Tech	22.07.2017 26.08.2017 09.09.2017	One	30
4	Metal Testing Lab	Mr.G.Srinivas Manager	TVS Brakes India Sholingur	22.07.2017 - 8 hrs	One	20
5	New Product Development - 30 Hrs	Dr. Sundararajan Head – R & D	Wheels India	22 & 29 July, 12, 25 & 26 Aug. 8 & 9 Sep. 2017	Two	30
6	Problem solving using Shainin Technique - 15 Hrs	Mr.Senthil Kumar - PD	WABCO India Limited	22.07.2017 29.07.2017 09.09.2017	One	30
7	Alternate Fuels and Engine – 20 Hrs	Dr.N.Saravanan Technology Innovation and Sustainability	Mahindra & Mahindra	22 July, 26 Aug, 9, 23 & 30 September 2017	One	30

Approval is requested for the above courses and also for the consideration of credit based on the attendance, assignment & test (The report will be submitted after the completion of the program).

Submitted for approval please

S.Karthik

AP/Mech & Co-ordinator

Dr.A.T.Ravichandran

HOD Mechanical

Prof. Dr. techn. Koteswara Rao Anne

Director Academics

Veltech Dr. RR & Dr. SR University

(Estd u/s of UGC Act, 1956)

400 feet Outer Ring Road, Avadi,
Chennai-600 062, Tamil Nadu, India.
Landline : +044 2684 0332 / 2684 0262
Toll Free : 1800 3070 6949
Email : vtu@veltechuniv.edu.in
Website : www.veltechuniv.edu.in

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Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction Engineering

Department of Mechanical Engineering

INDEPENDENT LEARNING COURSE ON

"PROBLEM SOLVING USING SHAININ TECHNIQUE"

By

Mr. M.SENTHIL KUMAR, PD, WABCO INDIA LIMITED

. Held on

29/7/17, 5/9/17 & 14/10/17

Course Schedule

Date	Topic
29/7/17	**INTRODUCTION TO SIX SIGMA** • DEFINE PHASE • MEASURE PHASE • ANALYZE PHASE • IMPROVE PHASE • CONTROL PHASE • PROBLEM DEFINITION • CATEGORIZING THE PROBLEMS • METHOD OF SOLVING • GO GEMBA
5/09/17	**DEFINE PHASE** • 1.SUSPECTED SOURCE OF VARIATION • 2. PAIED COMPARISON • 3. PRODUCT/PROCESS SEARCH • 4. COMPONENT SEARCH • 5. MODIFIED COMPONENT SEARCH • 6. MULTIVARI ANALYSIS • 7. CONCENTERATION CHARTS • 8. R&R STUDY • 9. INSTRUMENT CALIBRATION
14/10/17	**CASE STUDY** • DIFFERENT TYPE OF PROBLEM • SOFT SKILL

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School of Mechanical & Construction Engineering

Department of Mechanical Engineering

The following students have been shortlisted to attend the independent learning course on "PROBLEM SOLVING USING SHAININ TECHNIQUE" to be held on 29/7/17, 5/9/17 & 14/10/17.

S.NO	VTU NO	NAME	YEAR
1	7710	D.Prudhvi Raj	II
2	7337	P.Suresh	II
3	7793	R.B.S.V.Siva Kumar	II
4	8176	R.Vamsi	II
5	8177	Harsha	II
6	7559	B.Vineeth reddy	II
7	7624	P.Ganesh Shankar	II
8	7659	P.Hema teja	II
9	6293	M.Sai venkat raju	II
10	7600	U.Manoj	II
11	7651	D.Gokula krishnan	II
12	7652	Aravind Gurudharan	II
13	7576	Y.Sivanjaney Reddy	II
14	7703	K.Prudhvi Raj	II
15	7538	A.Nikhil Andrew	II
16	8061	Krithick Vignesh.R	II
17	7570	Dharmendra Kumar	II
18	7638	Ashwin Rao.V	II
19	8438	Rubesh Khanna.S	II
20	6679	Sandipan Roy	III
21	6293	A.Vinod Kumar	III
22	6663	G.R.Kranthi Kumar	III
23	5997	Akhil S.Nair	III
24	6107	V.Puneeth	III
25	6192	Ram Chandra Sharma	III
26	5886	Ramana A.B	III
27	8346	Karthikeyan.B	III
28	6207	K.Pavan kumar	III
29	6558	Raja Ahmed Saikia	III
30	6595	T.Phani Mohan	III

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Department of Mechanical Engineering

Attendance List of Students

Registered for the Specialized Course under Section 7.2.8.3 VTU R 15

Name of the Course: Problem solving using Shainin Technique

Hall: National, Instrument Lab, Research Park, VTU Date: 29/07/2017,09/09/2017

S.NO	VTU NO	NAME	YEAR	29/07/17		05/09/17		14/10/
				FN	AN	FN	AN	FN
1	7710	D.Prudhvi Raj	II					
2	7337	P.Suresh	II					
3	7793	R.B.S.V.Siva Kumar	II					
4	8176	R.Vamsi	II					
5	8177	Harsha	II					
6	7559	B.Vineeth reddy	II			AB		
7	7624	P.Ganesh Shankar	II					
8	7659	P.Hema teja	II					
9	6293	M.Sai venkat raju	II			AB	AB	AB
10	7600	U.Manoj	II					
11	7651	D.Gokula krishnan	II	AB		AB	AB	AB
12	7652	Aravind Gurudharan	II			AB	AB	AB
13	7576	Y.Sivanjaney Reddy	II	AB		AB	AB	AB
14	7703	K.Prudhvi Raj	II	AB		AB	AB	AB
15	7538	A.Nikhil Andrew	II			AB	AB	AB
16	8061	Krithick Vignesh.R	II			AB	AB	AB
17	7570	Dharmendra Kumar	II	AB		AB	AB	AB
18	7638	Ashwin Rao.V	II			AB	AB	AB
19	8438	Rubesh Khanna.S	II	AB		AB	AB	AB
20	6679	Sandipan Roy	III			AB	AB	AB
21	6293	A.Vinod Kumar	III	AB				
22	6663	G.R.Kranthi Kumar	III					AB
23	5997	Akhil S.Nair	III			AB	AB	AB
24	6107	V.Puneeth	III					
25	6192	RamChandra Sharma	III					
26	5886	Ramana A.B	III			AB	AB	AB
27	8346	Karthikeyan.B	III			AB	AB	AB
28	6207	K.Pavan kumar	III					AB
29	6558	Raja Ahmed Saikia	III					
30	6595	T.Phani Mohan	III					
				NO OF ABS : 6		15	14	14

S. Kaul

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School of Mechanical & Construction Engineering

Department of Mechanical Engineering

Attendance percentage and consolidated marks

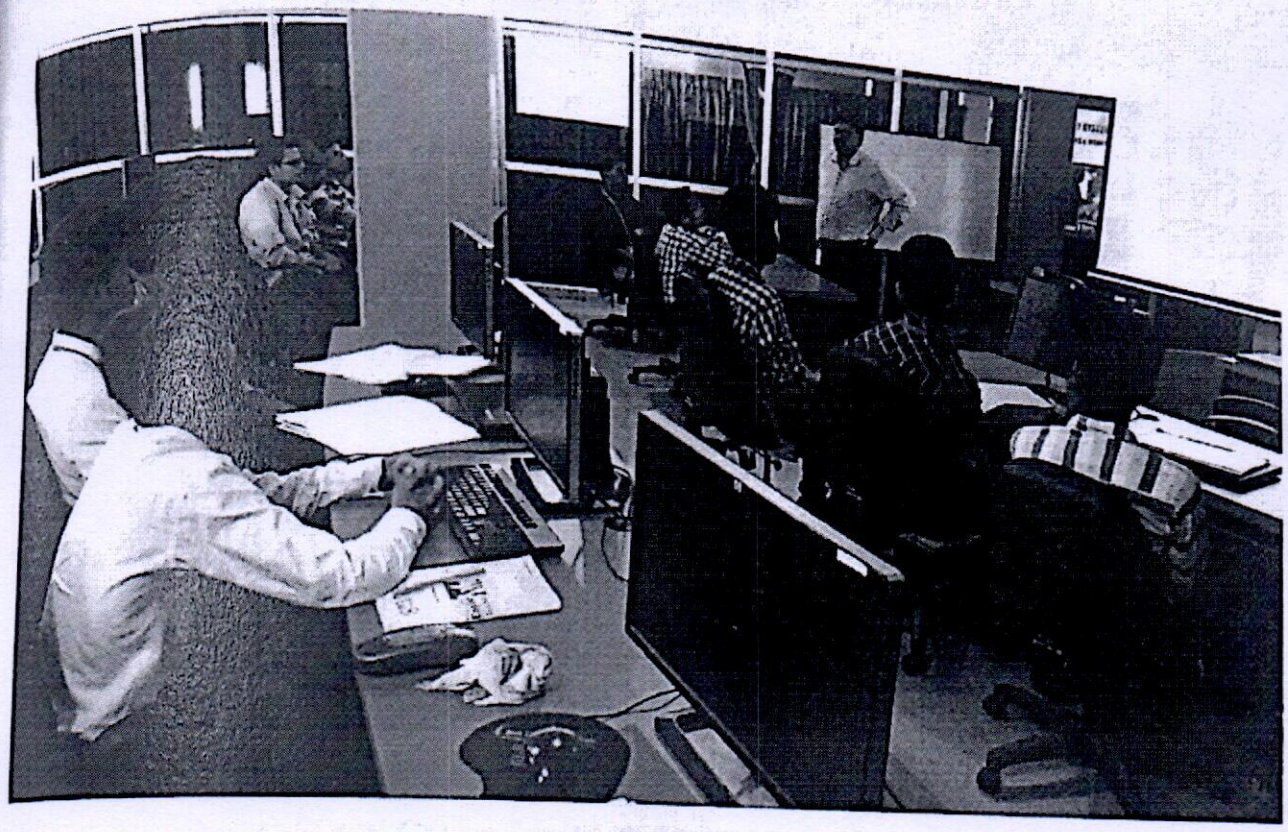
S.NO	Year	VTU Id	Name	Attendance Percentage	Total Marks			
					Test Marks	Assignment Marks	Total Marks	Grades
1	II	7710	D.Prudhvi Raj	100	68	18	86	A
2	II	7337	P.Suresh	100	64	15	79	B
3	II	7793	R.B.S.V.Siva Kumar	100	60	17	77	B
4	II	8176	R.Vamsi	100	68	15	83	A
5	II	8177	Harsha	100	60	16	76	B
6	II	7624	P.Ganesh Shankar	100	64	16	80	B
7	II	7659	P.Hema teja	100	60	13	73	B
8	II	7600	U.Manoj	100	52	12	64	C
9	III	6107	V.Puneeth	100	76	16	92	S
10	III	6192	Ram Chandra Sharma	100	64	18	82	A
11	III	5886	Ramana A.B	100	48	16	64	C
12	III	6595	T.Phani Mohan	100	76	12	88	A
13	II	7559	B.Vineeth reddy	80	60	17	77	B
14	III	6293	A.Vinod Kumar	66	72	18	90	A
15	III	6663	G.R.Kranthi Kumar	66	0	19	19	RA
16	III	6558	Raja Ahmed Saikia	66	0	0	0	RA
17	II	6293	M.Sai venkat raju	33	0	0	0	RA
18	II	7652	Aravind Gurudharan	33	0	0	0	RA
19	II	7538	A.Nikhil Andrew	33	0	0	0	RA
20	II	8061	Krithick Vignesh.R	33	0	0	0	RA
21	II	7638	Ashwin Rao.V	33	0	0	0	RA
22	III	6679	Sandipan Roy	33	0	0	0	RA
23	III	5997	Akhil S.Nair	33	0	0	0	RA
24	III	8346	Karthikeyan.B	33	0	0	0	RA
25	III	6207	K.Pavan kumar	0	0	0	0	RA
26	II	7651	D.Gokula krishnan	0	0	0	0	RA
27	II	7576	Y.Sivanjaney Reddy	0	0	0	0	RA
28	II	7703	K.Prudhvi Raj	0	0	0	0	RA
29	II	7570	Dharmendra Kumar	0	0	0	0	RA
30	II	8438	Rubesh Khanna.S					

M. SAKTHIVEL KUMAR.

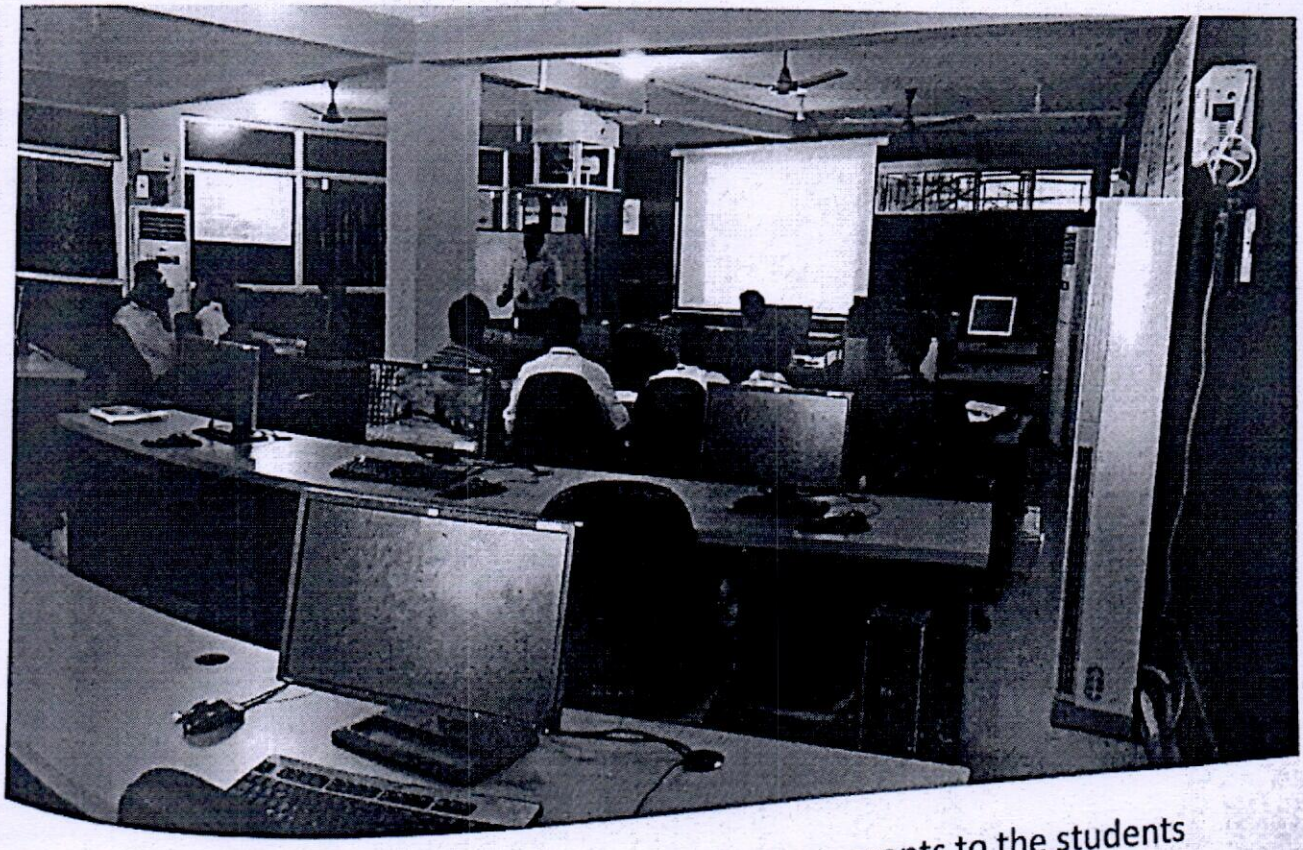
...avichandran
...f the Department.
...anical Engineering
...RR & Dr.SR University

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Photos

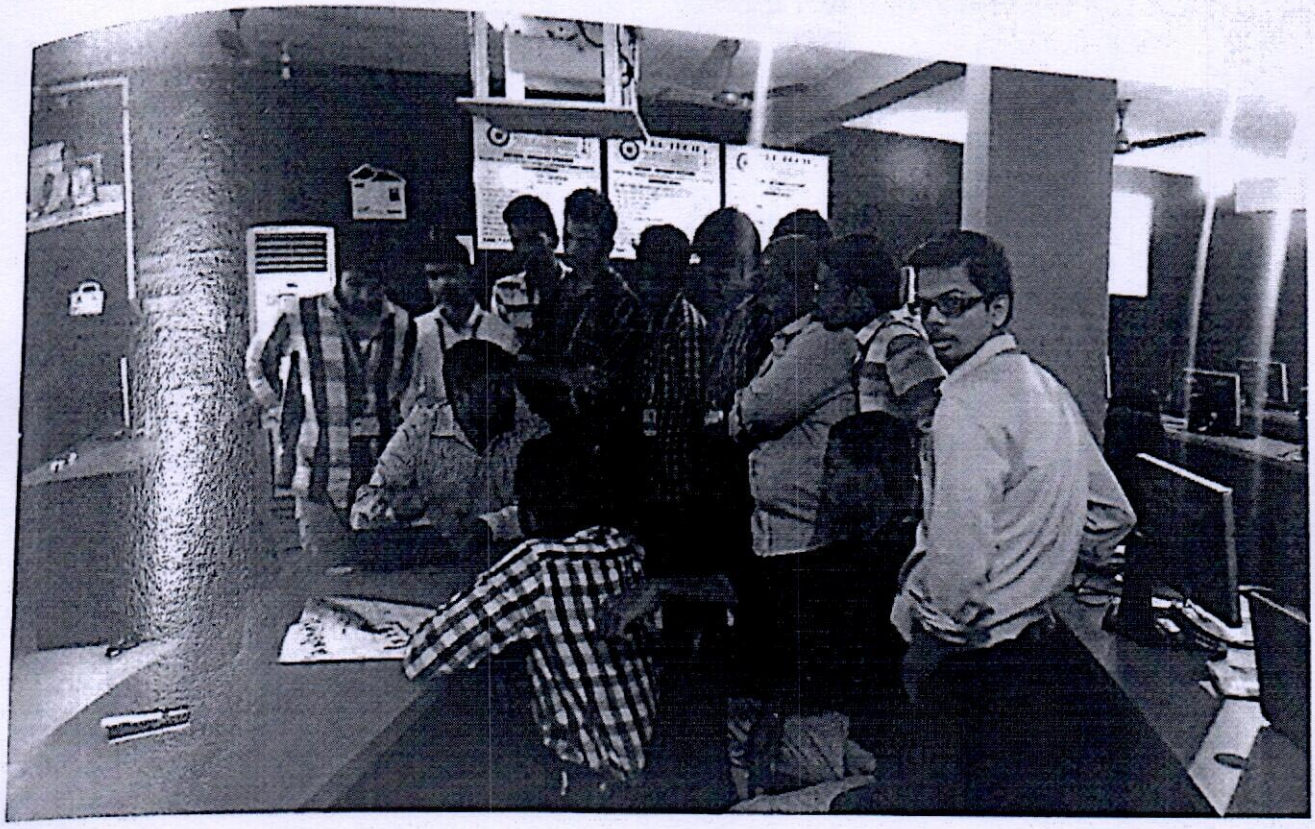


Students listening to the lecture given by Mr.M. Senthil Kumar

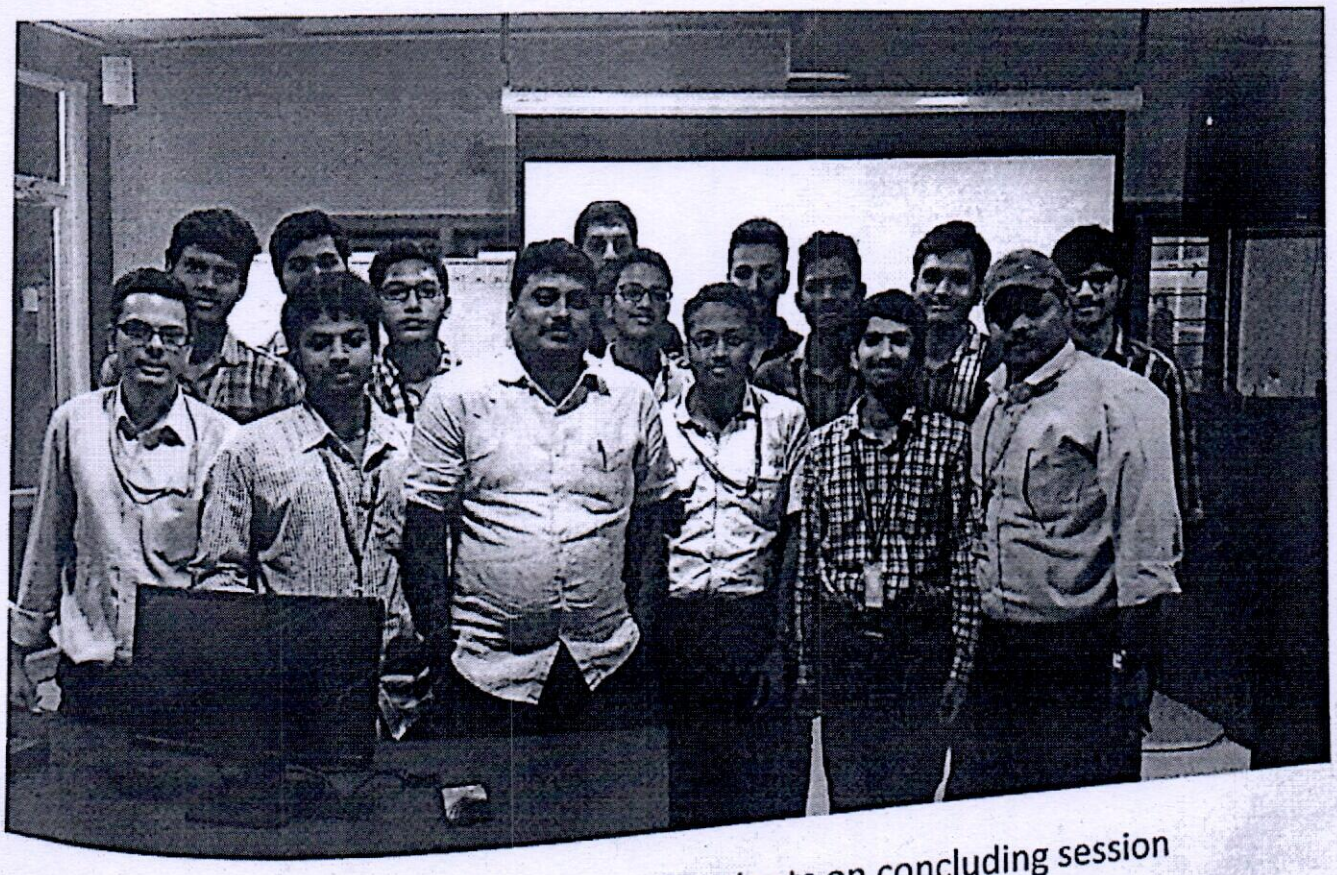


Mr.M. Senthil Kumar explaining six sigma concepts to the students

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Students interacting with Mr.M. Senthil Kumar



Mr.M.Senthil Kumar with the students on concluding session

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Credit Course Expert Feedback Form

Course Name: Problem solving using Shainin Technique

Industry: Wabco India Limited

School: SOMC Dept: Mechanical Date: 14th October 2017

S.No	Description	4 Very Good	3 Good	2 Fair	1 Poor
1	Lecture Hall Arrangements		✓		
2	Laboratory Facilities		✓		
3	Hospitality	✓			
4	Travel Arrangements	✓			
5	Interactions by the students		✓		
6	Overall Satisfaction		✓		

Any other Comments:

While teaching the Students, through Credit Course I am learning lot of new things through their doubts and Questions. Win-Win for both Students gets what industry looking for and We gets what new generations needs

Name: M. Senthil Kumar

Designation: DGM – DRD Test lab

Signature

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Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

Students Feedback Form

Course Name: Problem Solving Using Shainin Technique

Industry: Wabco India Limited

School: SOMC **Dept: Mechanical** **Date: 14th October 2017**

Q1. The training sessions were relevant to my needs?

✓ Yes ○ No

Q2. Experts were well prepared?

✓ Yes ○ No

Q3. The exercises helped me to learn the material?

✓ Yes ○ No

Q4. There was enough time to cover all materials?

✓ Yes ○ No

Q5. The training facilities were adequate

○ Yes ✓ No

Q6. The Course notes / slides were very useful

✓ Yes ○ No

Q7. I would recommend this training course to a colleague

✓ Yes ○ No

Any other Suggestions:

provide systems to solve the problem.

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(Estd. u/s 3 of UGC Act, 1956)

Certificate of Completion

Mr./~~Ms.~~ U. MANOJ

(VTU 7600) belongs to 2016 - 2017 Batch pursuing B.Tech.

in Mechanical Engineering at

Veltech Dr.RR & Dr.SR University, Chennai has successfully completed the 15 hours Specialized Course on

Problem Solving using Shainin Technique.

Conducted by

Mr. M.Senthilkumar

Product Development, WABCO India Limited

organized by the

Department of Mechanical Engineering



Topics Covered

- Problem definition
- Categorizing the problem
- Method of solving
- Go gemba
- DMAIC process
- Various tools used in Problem solving and their application.
- Paired comparison
- Product/Process search
- Component search
- Modified Component search
- Multivari Analysis
- Concentration charts
- Repeatability and Reproducibility study
- Instrument calibration
- Various case study
- Different types of problem and the soft skills

Mr. M.Senthilkumar
Product Development
WABCO India Limited

Dr.Ravichandran.A.T
HOD – Mechanical / Dean (I/c) - SOMC

Prof. Dr.Techn.Koteswara Rao Anne
Director Academics

Prof. Dr.Beela Satyanarayana
Vice Chancellor

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ICC-17

1/2

Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction Engineering

Department of Mechanical Engineering

Credit Course on

"WELDING TECHNOLOGY"

by

Mr. V. P. BALAJI,

SENIOR MANAGER,

WABCO INDIA LIMITED,

Held on

22/07/17, 29/07/17, 12/08/17, 14/10/17

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Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction Engineering
Department of Automobile Engineering

One Credit Course on "Welding Technology"

By

Mr. V. P. BALAJI
Senior Manager, WABCO India Limited
22/07/17, 29/07/17, 12/08/17 & 14/10/17

TABLE OF CONTENTS

Sl. No	TITLE
1	Acceptance by industry expert
2	Expert profile
3	Course syllabus
4	Approval letter
5	Course schedule
6	Student's name list
7	Student attendance
8	Student attendance percentage
9	Student Assessment marks
10	Student Assessment result
11	Course Material – annexure I
11	Photos
12	Expert Feedback
13	Head of the Department Feedback
14	Student's Feedback
15	Honorarium
16	Certificate copy

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Industry Relations Office Veltech, Chennai <dindoffice@veltechuniv.edu.in>
21 July 2017 at 09:54
Fwd. Credit course on Welding Technology_ Regarding
SEC11 VELTECH@gmail.com
Director Industry Relations <DIND@veltechuniv.edu.in>

---------- Forwarded message ----------
Balaji -PD-WINC, VP <vp.balaji@wabco-auto.com>
Fri, Jul 21, 2017 at 9:51 AM
Re: Credit course on Welding Technology_ Regarding
Industry Relations Office Veltech, Chennai" <dindoffice@veltechuniv.edu.in>

Sir

find attached my bio-data and content for presentation.
revert to me if anything further.

ards
Balaji

Thu, Jul 20, 2017 at 9:35 AM, Industry Relations Office Veltech, Chennai <dindoffice@veltechuniv.edu.in> wrote:

ear Sir,
reetings from Veltech University!!
e request you to commence the subject credit course from 22nd July as already discussed.
equest you to send your bio data/profile for the benefit of students immediately.
equest also send the PPT /Write up for the first session of 22nd July. .
rst sesion will be of 4 hours (10.45 to 12.45 and 1.45 to 3.45 on 22nd july.,totaling 4 hours)
equest you to come by your own transport.We shall reimburse Rs 1250 for to and fro.Honororium will be paid at the end of
e completion of 15 hours lectures ie on completion of 3 to 4 sessions.
equest arrange to send the profile and the PPT/Write up for students.
ease Confirm.
ith best Regards.
est Regards,

rof. C.S.SIVAKUMAR
echnical Secretary to Founder President,
ynamic Development Department (DDD)
eltech Dr. RR & Dr. SR University.
obile: 09445049402
mail ID: dindoffice@veltechuniv.edu.in
ebsite:http://www.veltechuniv.edu.in

---------- Forwarded message ----------
ont Balaji -PD-WINC, VP <vp.balaji@wabco-auto.com>
ate: Tue, Jul 11, 2017 at 4:34 PM
ubject: Re: Finalizing the schedule for Single credit course on Welding Technology._ Veltech university_ Regarding
: "Industry Relations Office Veltech, Chennai" <dindoffice@veltechuniv.edu.in>

ear Sir

he following dates are acceptable for me.

2nd July
9th July
2th Aug
h Sep
3rd Sep

lease confirm the same.

egards
P.Balaji

n Thu, Jul 6, 2017 at 10:25 AM, Industry Relations Office Veltech, Chennai <dindoffice@veltechuniv.edu.in> wrote:

Dear Sir,
Greetings from Veltech University!!!
This has reference to the single credit course for Veltech students. Kindly note that we have included Fridays also for giving Guest Lectures on this topic.We propose generally that the 15 hours of lectures be taken on any 5 days out of the following dates (Timing 9 A.M to 12.PM).However on the days when unit test/mid term test/Practicals for students clash with these dates shown in red , we shall request for change in timing to 10am/11 am to 2.00 pm/3pm including break for lunch between 12 to 1pm on these dates.

1. 21ST July, Friday

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2017

2. 22nd July Sat
3. 28th July Fri
4. 29th July Sat
5. 11th Aug Fri
6. 12th Aug Sat
7. 25th Aug Fri
8. 26th Aug Sat
9. 8thSep Fri
10. 9th Sep Sat
11. 22nd Sep Fri
12. 23rd Sep Sat
13. 13th Oct Fri
14. 14th Oct Sat

Your convenient dates will help us in planning the schedule of conduct of single credit course .
With best regards.
Best Regards,

Prof. C.S.SIVAKUMAR
Technical Secretary to Founder President,
Dynamic Development Department (DDD)
Veltech Dr. RR & Dr. SR University.
Mobile: 09445049402
Email ID: dindoffice@veltechuniv.edu.in
Website:http://www.veltechuniv.edu.in

---------- Forwarded message ----------
From: **Balaji -PD-WINC, VP** <vp.balaji@wabco-auto.com>
Date: Fri, Apr 28, 2017 at 2:01 PM
Subject: Re: Sample _Course Outcome details _ Veltech University.
To: "Industry Relations Office Veltech, Chennai" <dindoffice@veltechuniv.edu.in>

Dear Sir

As discussed, I made first level content for the course "Welding Technology-Industry Perspective". Please find attachment for the same.
Please revert me, if you have any queries.

Regards
VP.Balaji

On Thu, Apr 20, 2017 at 4:54 PM, Industry Relations Office Veltech, Chennai <dindoffice@veltechuniv.edu.in> wrote:

Dear Sir,
Greetings from Veltech Dr.RR& Dr.SR.University!!!
This has reference to the discussion on this subject.We thank you for sending the first level content for one / two credit course.
Request you to let us know as to how many hours will be required to cover these topics.
Should you require further details we are glad to meet you on any convenient date.
With best Regards.
C.S.SIVAKUMAR,
Professor&Technical Secretary to Founder President,
Dynamic Development Department (DDD)
Vel Tech Dr. RR & Dr. SR Technical University.
Phone: 044 26841622 Fax: 044 26840605 **Mobile:09445049402**
Email ID: veltech@vsnl.com & chancellor@vel-tech.org
Website:http://www.veltechuniv.edu.in

---------- Forwarded message ----------

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Expert Profile



V.P. BALAJI

Experience Summary

S.NO	DESIGNATION	ORGANISATION
1	Leader – Materials	WABCO India Ltd, Chennai
2	Welding Engineer	Petroleum Development of Oman
3	Metallurgist (R&D -QA/QC-Materials - Welding),	Ajantha Autocast P Ltd, Chennai
4	Metallurgist (R&D -QA/QC-Materials - Welding)	Emirates Techno Casting (ETC), Sharjah, UAE
5	Scientist – DRDO	Naval Materials Research Laboratory (NMRL-DRDO)

- 16 years of professional experience in Material Selection, Welding, Heat treatment, Inspection, NDT, Corrosion Engineering, Casting, ,Fracture Mechanics studies, QA/QC activities., Modern testing of Materials and Failure Analysis of the components.

Educational Qualifications

S.NO	DEGREE	DEPARTMENT	COLLEGE	YEAR OF STUDY
1	D.M.E	Mechanical	Thiagarajar Polytechnic Salem	(1992-1995)
2	B.E	Metallurgy	Madras University Chennai	(1996 -1999)
3	M.S (By Research)	Welding	Indian Institute of Technology Chennai	(2000 - 2004)

Professional Qualification/Certification

S.NO	CERTIFICATION
1	IWE – International Welding Engineer Certification by IIW
2	Six Sigma Green belt certified

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3	ASNT Level III in RT – No - 191512
4	ASNT Level II in VT, UT, MT, PT

Membership

S.NO	MEMBERSHIP
1	Executive member in Indian Institute of Metals (IIM) Ambernath chapter
2	Membership in ASNT- Membership No -191512.
3	Petroleum Development of Omen (PDO) approved Welding Engineer

Publications

- 9 Journal papers including conference proceedings.

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Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

Department of Mechanical Engineering

One credit course on Welding Technology

on 22/07/17, 29/07/17, 12/08/17 & 14/10/17

By

Mr.V. P. BALAJI

Senior Manager, Wabco India Private Limited

Course Syllabus

Contents:

Chapter 1 • Introduction of welding • Welding history • Welding fundamentals • Welding processes and techniques • Welding terminology • Types of weld joints • Welding symbols • Industrial application
Chapter 2 • Welding Equipment • Solidification of weld metal • Heat flow in welds • Physical Metallurgy • Assessment-1 • Metallurgy of Welding • Weldability of steel and other alloys • Weld defects
Chapter 3 • Filler wire classification • International and Indian standards • Assessment-2 • Weld testing standards • Welding procedure specification • Procedure qualification record • Welding pre-qualification • Weld defects • Online Test

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School of Mechanical & Construction Engineering

Department of Mechanical Engineering

Ref : VTU/DoME/Specilized courses/2017 – 18

Date: 8 July 2017

Submitted for Approval

Sir,

The Department of Mechanical Engineering offers the following One/Two credit course for the students of III Year Mechanical Engineering under Regulation VTU R 15 Section 7.2.8.3. These courses are offered by industry experts.

S. No	Course Name	Expert Name	Organization	Date(s)	No. of Credits	Max no of seats
1	Welding Technology - 15 Hrs	V.P.Balaji Sr. Manager R&D	WABCO India Limited	22 & 29.07.2017 12.08.2017 & 09.09.2017	One	30
2	Gear Cutting tools, basics, Design, Mfg, application & Development - 15 hrs	Mr. Rajagopalan GM (Rtd.) & Mr. Veera Ragavan Manager (Rtd.)	ADDISONS & CO. LTD	22.07.2017 29.07.2017 12.08.2017 or 26.08.2017	One	30
3	Wind Energy Technology – 15 Hrs	R.Kumaravel AVP & Head – Engg. & Develop	Regen Power Tech	22.07.2017 26.08.2017 09.09.2017	One	30
4	Metal Testing Lab	Mr.G.Srinivas Manager	TVS Brakes India Sholingur	22.07.2017 - 8 hrs	One	20
5	New Product Development - 30 Hrs	Dr. Sundararajan Head – R & D	Wheels India	22 & 29 July, 12, 25 & 26 Aug. 8 & 9 Sep. 2017	Two	30
6	Problem solving using Shainin Technique - 15 Hrs	Mr.Senthil Kumar - PD	WABCO India Limited	22.07.2017 29.07.2017 09.09.2017	One	30
7	Alternate Fuels and Engine – 20 Hrs	Dr.N.Saravanan Technology Innovation and Sustainability	Mahindra & Mahindra	22 July, 26 Aug, 9, 23 & 30 September 2017	One	30

Approval is requested for the above courses and also for the consideration of credit based on the attendance, assignment & test (The report will be submitted after the completion of the program).

Submitted for approval please

S.Karthik

AP/Mech & Co-ordinator

Dr.A.T.Ravichandran

HOD Mechanical

Prof. Dr. techn. Koteswara Rao Anne

Director Academics

Veltech Dr. RR & Dr. SR University

(Estd u/s of UGC Act, 1956)

400 feet Outer Ring Road, Avadi,
Chennai-600 062, Tamil Nadu, India.
Landline : +044 2684 0332 / 2684 0262
Toll Free : 1800 3070 6949
Email : vtu@veltechuniv.edu.in

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(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction Engineering
Department of Mechanical Engineering

INDEPENDENT LEARNING COURSE ON
"WELDING TECHNOLOGY"
by
Mr. V P. BALAJI, WABCO INDIA LIMITED
Held on
22/07/17, 29/07/17, 12/08/17 & 14/10/17

Course Schedule

Date	Topic
22/07/17	**Chapter 1** • Introduction of welding • Welding history • Welding fundamentals • Welding processes and techniques • Welding terminology • Types of weld joints • Welding symbols • Industrial application
29/07/17	**Chapter 2** • Welding Equipments • Solidification of weld metal • Heat flow in welds • Physical Metallurgy • Assessment-1
12/08/17	**Chapter 2** • Metallurgy of Welding • Weldability of steel and other alloys • Weld defects **Chapter 3** • Filler wire classification • International and Indian standards • Assessment-2
13/10/17	**Chapter 3** • Weld testing standards • Welding procedure specification • Procedure qualification record • Welding pre-qualification • Weld defects • Online Test

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Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction Engineering

Department. of Mechanical Engineering

Name list

The following students have been shortlisted to attend the independent learning course on **'WELDING TECHNOLOGY"** to be held on **22/07/17, 29/07/17, 12/08/17 & 14/10/17.**

S.NO	VTU NO	NAME	YEAR
1	6635	T. SATYANARAYANA	III
2	6655	A. MALLIKARJUNA RAO	III
3	5929	S. KISHORE NAIDU	III
4	6253	S. VARUN KUMAR	III
5	6430	E. BHANU PRAKASH	III
6	6581	B. SURESH RATNA KUMAR	III
7	6447	P. PAVAN KUMAR REDDY	III
8	6476	CH. RAJU	III
9	6650	VAINAYAK PRASAD	III
10	6649	VIGHNESH PRASAD	III
11	6657	JAYADEEP. R	III
12	6140	S. MOHAMMED ASAN	III
13	6220	A. NAGARAJAN	III
14	8347	R. RAJESH	III
15	6287	G. CHARAN TEJA REDDY	III
16	6343	E. JESWANTH KALYAN KRISHNA	III
17	8132	K. V. SURYA SAI RAM	III
18	6188	D. GOPI SAI CHANDU	III
19	6294	G. YASWANTH	III
20	6139	CH.N.V. RAGHURAM	III
21	5971	PRATIM PARAL	III
22	6389	PATAN ABDUL KHADAR	III
23	7557	J. KIRAN MANIKANTA NAGARAJU	II
24	8261	CH. BALAJI	II
25	7776	N. SAI KIRAN	II
26	7683	NAVEEN. S	II
27	7032	E. GIREESH	II
28	7601	B. PRAKASH RAJ	II
29	7644	G. M. S. S. K. BHARATH KUMAR	II
30	7569	A. BHARGAV RAJA	II

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WELDING TECHNOLOGY

COURSE FACULTY : V. P. BALAJI, SR Manager - R&D, WABCO INDIA LTD., CHENNAI

VENUE: 1722 - WRITE BRITHORS ..'GINEERING HIVE

SL. NO	VTU NO	NAME	YEAR	SIGNATURE							
				22.07.2017 (4HRS)		29.07.17 (4HRS)		12.08.2017 (4HRS)		(4HRS)	
				F.N	A.N	F.N	A.N	F.N	A.N	F.N	A.N
1	6635	T. SATYANARAYANA	III								
2	6655	A. MALLIKARJUNA RAO	III	AB	AB	AB		AB		AB	AB
3	5929	S. KISHORE NAIDU	III								
4	6253	S. VARUN KUMAR	III	AB	AB	AB		AB		AB	AB
5	6430	E. BHANU PRAKASH	III								
6	6581	B. SURESH RATNA KUMAR	III								
7	6447	P. PAVAN KUMAR REDDY	III	P. Pavan	P. Pavan	P. Pavan		P. Pavan		P. Pavan	P. Pavan
8	6476	CH. RAJU	III			AB					
9	6650	VAINAYAK PRASAD	III								
10	6649	VIGHNESH PRASAD	III								
11	6657	JAYADEEP. R	III								
12	6140	S. MOHAMMED ASAN	III								
13	6220	A. NAGARAJAN	III								
14	8347	R. RAJESH	III			AB					
15	6287	G. CHARAN TEJA REDDY	III								AB
16	6343	E. JESWANTH KALYAN KRISHNA	III								
17	8132	K.V.S. SURYA SAI RAM	III								
18	6188	D. GOPI SAI CHANDU	III								
19	6294	G. YASWANTH	III								
20	6139	CH.N.V. RAGHURAM	III								
21	5971	PRATIM PARAL	III					AB			
22	6389	PATAN ABDUL KHADAR	III								
23	7557	J. KIRAN MANIKANTA NAGARAJU	II					AB		AB	AB
24	8261	CH. BALAJI	II								
25	7776	N. SAI KIRAN	II								
26	7683	NAVEEN. S	II	AB	AB						
27	7032	E. GIREESH	II								
28	7601	B. PRAKASH RAJ	II		AB						
29	7644	G. M. S. S. K. BHARATH KUMAR	II	Bharat Kumar	Bharat Kumar	Bharat Kumar		AB		Bharat Kumar	Bharat Kumar
30	7569	A. BHARGAV RAJA	II			AB		AB		AB	
		No of. AB:		3	4	7		7		5	5

Faculty coordinator:

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Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

Attendance Percentage

S.NO	VTU NO	NAME	YEAR	ATTENDANCE PERCENTAGE %
1	6635	T. SATYANARAYANA	III	100
2	6655	A. MALLIKARJUNA RAO	III	0
3	5929	S. KISHORE NAIDU	III	100
4	6253	S. VARUN KUMAR	III	0
5	6430	E. BHANU PRAKASH	III	100
6	6581	B. SURESH RATNA KUMAR	III	100
7	6447	P. PAVAN KUMAR REDDY	III	100
8	6476	CH. RAJU	III	80
9	6650	VAINAYAK PRASAD	III	100
10	6649	VIGHNESH PRASAD	III	100
11	6657	JAYADEEP. R	III	80
12	6140	S. MOHAMMED ASAN	III	75
13	6220	A. NAGARAJAN	III	75
14	8347	R. RAJESH	III	53
15	6287	G. CHARAN TEJA REDDY	III	100
16	6343	E. JESWANTH KALYAN KRISHNA	III	100
17	8132	K. V. SURYA SAI RAM	III	100
18	6188	D. GOPI SAI CHANDU	III	100
19	6294	G. YASWANTH	III	100
20	6139	CH.N.V. RAGHURAM	III	75
21	5971	PRATIM PARAL	III	100
22	6389	PATAN ABDUL KHADAR	III	100
23	7557	J. KIRAN MANIKANTA NAGARAJU	II	47
24	8261	CH. BALAJI	II	100
25	7776	N. SAI KIRAN	II	75
26	7683	NAVEEN. S	II	75
27	7032	E. GIREESH	II	100
28	7601	B. PRAKASH RAJ	II	87
29	7644	G. M. S. S. K. BHARATH KUMAR	II	75
30	7569	A. BHARGAV RAJA	II	27

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Veltech Dr.RR & Dr.SR University

(Estd. u/s 3 of UGC Act, 1956)

School of Mechanical & Construction Engineering
Department of Mechanical Engineering

Submitted for Approval

20 November 2017

Sir,

The Department of Mechanical Engineering has organized a 15 hrs course on "Welding Technology" for II Year and III year Mechanical Engineering Students during the following days, 22/07/17, 29/07/17, 12/08/17 and 14/10/17. The course code is assigned as 1157ME903. Mr.V.P.Balaji, Senior Manager, WABCO India Limited was the resource person. The course was taught 4hrs, 3hrs, 4hrs, 4hrs on the respective dates.

Initially 30 students have registered for the specialised course. But only the following 25 students were regular and secured more than 75% attendance. These students cleared the final examination. One final online examination was conducted and evaluated by the resource person. The attendance particulars, marks secured by the students in the final examination are given in Annexure A

The course syllabus, daily schedule, final examination question paper along with few students' feedback is enclosed herewith.

This course may be considered as course offered under the Section 7.2.8 Higher Learning Institute Interaction and the above students are eligible for one credit under the VTU R15 Section 7.2.8.3.

Approval is kindly requested for

1. To accept the above course under the specialized course category as per the VTUR15
2. To award one credits to the 25 students under the Specialized course category under VTU R15 Section 7.2.8.3.

Submitted for approval please

(I Irfan Ahmed)
Course Coordinator

20/11

(Dr A T Ravichandran)
HoD Mechanical

Prof. Dr. techn. Koteswara Rao Anne
Director Academics
Veltech Dr. RR & Dr. SR University
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School of Mechanical & Construction Engineering

Department of Mechanical Engineering

Attendance percentage and consolidated marks

S.NO	Year	VTU Id	Name	Attendance Percentage	Total Assessment			
					Test Marks	Assignment Marks	Total marks	Grade
1	III	6635	T. SATYANARAYANA	100	30.4	16.5	66	D
2	III	6655	A. MALLIKARJUNA RAO	0	0	0	0	RA
3	III	5929	S. KISHORE NAIDU	100	36.8	9	65	D
4	III	6253	S. VARUN KUMAR	0	0	0	0	RA
5	III	6430	E. BHANU PRAKASH	100	22	14	51	E
6	III	6581	B. SURESH RATNA KUMAR	100	38.4	12	71	C
7	III	6447	P. PAVAN KUMAR REDDY	100	36.8	10.5	67	D
8	III	6476	CH. RAJU	80	32	9	58	E
9	III	6650	VAINAYAK PRASAD	100	33.6	12.5	65	D
10	III	6649	VIGHNESH PRASAD	100	30.4	11.5	59	E
11	III	6657	JAYADEEP. R	80	51.2	16	95	A
12	III	6140	S. MOHAMMED ASAN	75	33.6	5.5	55	E
13	III	6220	A. NAGARAJAN	75	27.2	9	51	E
14	III	8347	R. RAJESH	53	0	6	8	RA
15	III	6287	G. CHARAN TEJA REDDY	100	30.4	12	60	D
16	III	6343	E. JESWANTH KALYAN KRISHNA	100	41.6	14	79	C
17	III	8132	K. V. SURYA SAI RAM	100	40	13.5	76	C

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18	III	6188	D. GOPI SAI CHANDU	100	30.4	13.5	62	D
19	III	6294	G. YASWANTH	100	32	11.5	61	D
20	III	6139	CH.N.V. RAGHURAM	75	36.8	13.5	71	C
21	III	5971	PRATIM PARAL	100	33.6	11	63	D
22	III	6389	PATAN ABDUL KHADAR	100	30.4	11.5	59	E
23	II	7557	J. KIRAN MANIKANTA NAGARAJU	47	0	0	0	RA
24	II	8261	CH. BALAJI	100	30.4	12	60	D
25	II	7776	N. SAI KIRAN	75	43.2	9	74	C
26	II	7683	NAVEEN. S	75	30.4	12.5	61	D
27	II	7032	E. GIREESH	100	30.4	6	51	E
28	II	7601	B. PRAKASH RAJ	87	40	11	72	C
29	II	7644	G. M. S. S. K. BHARATH KUMAR	75	41.6	5.5	67	D
30	II	7569	A. BHARGAV RAJA	27	0	0	0	RA

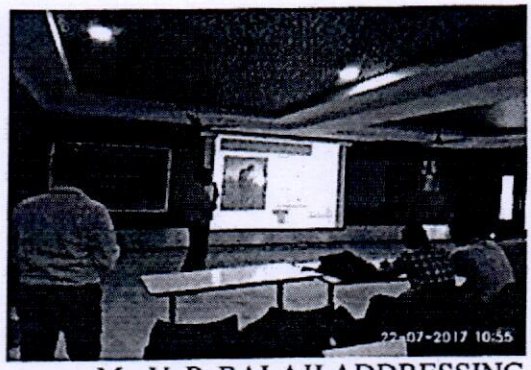
Dr. T. R. Chandran
Head of the Department
Mechanical Engineering
VelTech SR University

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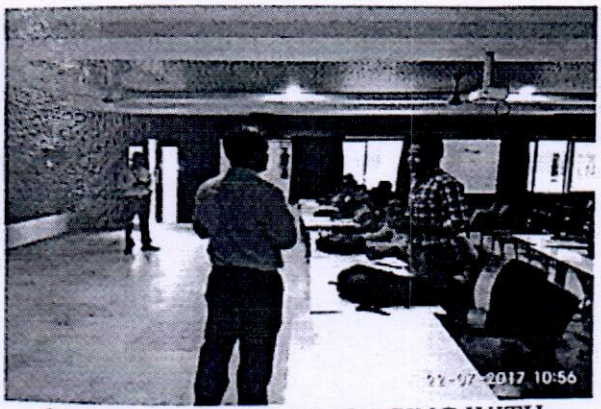
PHOTOS



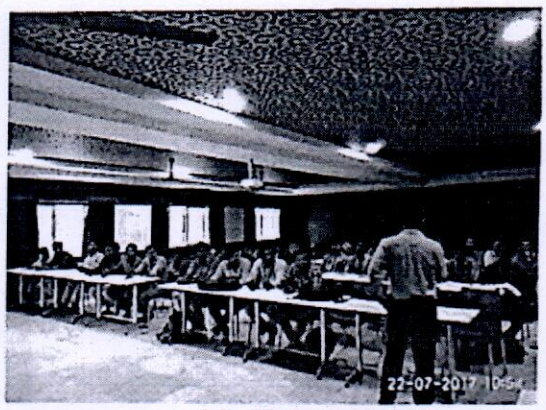
WELDING TECHNOLOGY CLASS ARRANGEMENTS



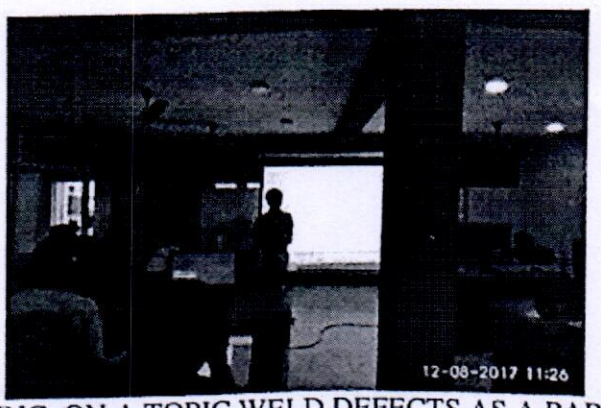
Mr. V. P. BALAJI ADDRESSING THE STUDENTS



Mr. V. P. BALAJI INTERACING WITH STUDENTS ABOUT THE TYPES OF WELDING



Mr. V. P. BALAJI SUMMARIZING THE TOPICS AT THE END OF SESSION



STUDENT PRESENTING ON A TOPIC WELD DEFECTS AS A PART OF ASSIGNMENT

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Credit Course Expert Feedback Form

Course Name: WELDING TECHNOLOGY

Industry: WABCO INDIA LTD

School: SOMC **Dept:MECHANICAL** **Date: 30-10-2017**

S.No	Description	4 Very Good	3 Good	2 Fair	1 Poor
1	Lecture Hall Arrangements		√		
2	Laboratory Facilities		√		
3	Hospitality	√			
4	Travel Arrangements	√			
5	Interactions by the students	√			
6	Overall Satisfaction	√			

Any other Comments:

It is really awesome experience that sharing my learnings and experiences to students.

I must thank Veltech and its management for giving this wonderful opportunity to share my experience to students. Really I'm delighted.

Name: V. P. BALAJI

Designation: Senior Manager

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