OTTO VON GUERICKE UNIVERSITÄT MAGDEBURG

OTTO VON GUERICKE UNIVERSITY MAGDEBURG

CERTIFICATE

FACULTY OF ELECTRICAL ENGINEERING AND INFORMATION TECHNOLOGY

Abhik Ghosh

born on April 20, 1987 in Bishnupur
having successfully passed all examinations in the study program

Electrical Engineering and Information Technology

has been awarded the degree

Master of Science (M.Sc.)

(Official Stamp/Seal)

Magdeburg, June 08, 2017

Prof. Dr.-Ing. Ralf Vick

Dean

OTTO VON GUERICKE UNIVERSITÄT MAGDEBURG

OTTO VON GUERICKE UNIVERSITY MAGDEBURG

FINAL DEGREE

FACULTY OF ELECTRICAL ENGINEERING AND INFORMATION TECHNOLOGY

Abhik Ghosh

born on April 20, 1987 in Bishnupur
having successfully passed all examinations in the master program in accordance with examination regulations of 07.02.2007.

Course of Studies:

Electrical Engineering and Information Technology

Master's Thesis:

Development of an Energy Management System for Demand Response Programs within Smart DC houses

Grade of Master's Thesis:

good (2,2)

Final Grade:

good (1,9)

Magdeburg, June 08, 2017

Otto-von-Guericke-Universität * Magdeburg * 2

(Official Stamp/Seal)

Prof. Dr. rer. nat. Christoph Hoeschen

Chair of Board of Examiners

Prof. Dr.-Ing. Ralf Vick

Dean

OTTO VON GUERICKE UNIVERSITÄT MAGDEBURG

OTTO VON GUERICKE UNIVERSITY MAGDEBURG

TRANSCRIPT OF RECORDS

FACULTY OF ELECTRICAL ENGINEERING AND INFORMATION TECHNOLOGY

(Official Stamp/Seal)

Abhik Ghosh

born on April 20, 1987 in Bishnupur

REQUIRED COURSES	CP	Grade
Digital Communication Systems	5	2,0
Digital Information Processing	5	passed
Electromagnetic Field Theory	5	3,0
Electronic Circuits	5	1,0
Power Electronics	5	1,0
Power Network Planning and Operation	5	1,7
Systems and Control	5	1,7
Project	**5**	**2,0**

OPTIONAL COURSES	CP	Grade
Advanced Power Electronics	5	2,0
Automation Lab	5	1,3
Distributed Control Systems	5	1,7
FPGA and Microcontroller Programming	5	1,0
Power Systems Control and Optimization	5	2,0
Process Control	5	2,0
Renewable Energy Sources	5	2,0
Structure and Behaviour Modelling - UML	5	2,0

NON-TECHNICAL COURSES	CP	Grade
German as a foreign language	10	3,1

	CP	Grade
Master's Thesis	**30**	**2,2**

ADDITIONAL SUBJECTS	CP	Grade
Integrated Project	10	2,3
Nonlinear Control	5	3,7
Power Electronic Components and Systems	5	2,7
Power System Economics and Special Topics	5	2,3

Grade: 1,0-1,5 excellent; 1,6-2,5 good; 2,6-3,5 satisfactory; 3,6-4,0 pass; 4,1-5,0 fail;
CP = Credit Points, European Credit Transfer System (ECTS)

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ

VISVESWARAIAH TECHNOLOGICAL UNIVERSITY, BELGAUM

KARNATAKA, INDIA

Certifies that

ABHIK GHOSH

ಬ್ಯಾಚಲರ್ ಆಫ್ ಇಂಜಿನಿಯರಿಂಗ್

ಪದವಿಗೆ ಅಗತ್ಯವಾದ ಅರ್ಹತೆಗಳನ್ನು ಳ್ಳವರೆಂದು ಪರಿಗಣಿತವಾಗಿರುವ ಕಾರಣ
ಮೇಲೆ ಕಾಣಿಸಿದ ಪದವಿಗೆ ಅವರನ್ನು ಅಂಗೀಕರಿಸಲಾಗಿದೆ.

has been duly admitted to the Degree of

Bachelor of Engineering

in recognition of the fulfilment of requirements

for the said degree

ಪರೀಕ್ಷಾ ಕ್ರಮ ಸಂಖ್ಯೆ
University Seat Number : 1RN05EE001

ವಿಷಯ
Subject : *Electrical & Electronics Engineering*

ಶ್ರೇಣಿ
Class : *First Class with Distinction*

D 09 046389

ವಿಶ್ವವಿದ್ಯಾಲಯದ ಮುದ್ರೆಯೊಂದಿಗೆ ಕೊಡಲ್ಪಟ್ಟಿದೆ
Given under the seal of the University

ಬೆಳಗಾವಿ
Belgaum

ದಿನಾಂಕ
Date : *JAN 07, 2010*

H.P. Khincha

ಕುಲಪತಿ
VICE CHANCELLOR

Visveswaraiah Technological University, Belgaum
Karnataka State, INDIA 44021

TRANSCRIPT AS PER RECORDS

We do not have GPA scheme of evaluation

Name : ABHIK GHOSH
University Seat No : 1RN05EE001
Year of Entrance : 2005
Year of Leaving : 2009
Degree Received : Bachelor of Engineering
(Electrical & Electronics Engineering)

1. Duration of the Course : 4 Years
2. Medium of Instruction : English
3. First class with distinction (FCD) : Not less than 70% of the aggregate marks in first attempt
4. First class (FC) : Less than 70% but not less than 60% of the aggregate marks in first attempt
5. Second class (SC) : Less than 60% of the aggregate marks in first attempt

SUBJECTS	Hours Per Week: Lecture	Hours Per Week: Drawing/ Practical	Marks Obtained	Max. Marks
I Semester				
1 Engineering Mathematics - I	4		101	125
2 Engineering Physics	4		106	125
3 Elements of Civil Engineering	4		109	125
4 Elements of Mechanical Engineering	4		99	125
5 Basic Electrical Engineering	4		99	125
6 Workshop Practice		3	63	75
7 Engineering Physics Lab		3	70	75
First Attempt Total: 647 / 775 ; Class : FCD ; # 1				
II Semester				
1 Engineering Mathematics - II	4		117	125
2 Engineering Chemistry	4		100	125
3 Computer Concepts & 'C' Programming	4		87	125
4 Engineering Graphics	4		76	125
5 Basic Electronics	4		68	125
6 Computer Programming Lab		3	69	75
7 Engineering Chemistry Lab		3	57	75
First Attempt Total: 574 / 775 ; Class : FCD ; # 1				
III Semester				
1 Engineering Mathematics - III	4		95	125
2 Electronics Circuits	4		77	125
3 Logic Design	4		76	125
4 Network Analysis	4		79	125
5 Electrical & Electronics Measurement	4		75	125
6 Signals & Systems	4		68	125
7 Analog Electronics Lab		3	58	75
8 Digital Electronics Lab		3	66	75
First Attempt Total: 594 / 900 ; Class : FC ; # 1				
IV Semester				
1 Engineering Mathematics - IV	4		89	125
2 Power Electronics	4		74	125
3 Control Systems	4		65	125
4 Field Theory	4		90	125
5 Microprocessors	4		63	125
6 Computer Organisation	4		76	125
7 Microprocessors Lab		3	46	75
8 Power Electronics Lab		3	62	75
First Attempt Total: 565 / 900 ; Class : FC ; # 1				

SUBJECTS	Hours Per Week: Lecture	Hours Per Week: Drawing/ Practical	Marks Obtained	Max. Marks
V Semester				
1 Electrical Power Generation	4		87	125
2 Modern Control Theory	4		108	125
3 Electrical Power Transmission & Distribution	4		104	125
4 DC Machines & Synchronous Machine	4		89	125
5 Digital Signal Processing	4		67	125
6 Operational Amplifiers & Linear IC's	4		81	125
7 DC Machines & Synchronous Machines Lab		3	62	75
8 Circuits Simulation & Measurements Lab		3	61	75
First Attempt Total 659 / 900 ; Class: FCD ; # 1				
VI Semester				
1 Power System Analysis and Stability	4		114	125
2 Electrical Machine Design	4		86	125
3 Switch Gear and Protection	4		98	125
4 Transformer and Induction Machine	4		95	125
5 Electrical Drawing and CAD	4		92	125
6 Digital System Design using VHDL	4		85	125
7 Transforms Induction Machines Lab		3	66	75
8 Control System Lab		3	69	75
First Attempt Total 705 / 900 ; Class: FCD ; # 1				
VII Semester				
1 Constitution of India & Professional Ethics	4		83	125
2 Computer Techniques in Power System	4		81	125
3 Electrical Power utilization	4		98	125
4 High Voltage Engineering	4		91	125
5 Renewable energy Source	4		99	125
6 Operations Research	4		81	125
7 Relay HV Lab		3	57	75
8 Power Simulation Lab		3	62	75
First Attempt Total 569 / 775 ; Class: FCD ; # 1				
VIII Semester				
1 Ind. Mgmt.,Electrical Estimation & Economics	4		100	125
2 Industrial Drives & Application	4		98	125
3 Computer Communication Networking	4		95	125
4 VLSI circuits and Design	4		91	125
5 Project Work	3		177	200
6 Seminar on Project Work			42	50
First Attempt Total 603 / 750 ; Class: FCD ; # 1				

Grand total of V to VIII Semester : 2536 out of 3325 (max.)

Class of the Degree * First Class with Distinction

CIP71 is not considered for Grand Total and the Class Declaration

AUTHENTIC

Visveswaraiah Technological University BELGAUM

*Based on First Attempt Marks of V to VIII Semesters # Number of Attempts taken to clear the semester

Registrar (Evaluation)

Visveswaraiah Technological University, Belgaum
Karnataka State, INDIA – 590 014

The **Visveswaraiah Technological University (VTU)** has been established by the Government of Karnataka on 1st April 1998 with its headquarters at Belgaum, as per the provisions of the VTU Act 1994. For effective administration, four Regional Offices at the four Revenue Divisional Head Quarters, namely, Belgaum, Bangalore, Gulbarga and Mysore have been established. **VTU is a Member of Association of Commonwealth Universities.**

There are at present 198 Engineering Colleges affiliated to VTU (100 under Bangalore Region, 52 under Mysore Region, 29 under Belgaum Region and 17 under Gulbarga region)

The University offers 27 graduate courses (B.E. / B.Tech. / B.Arch.), 85 Postgraduate courses (M.Tech.), and other courses like M.B.A., M.C.A., M.Sc.(Engg.) by research and Ph.D. programmes. Every year about 55,497 students take admission for undergraduate courses, 3,200 students for PG courses, 2,608 students for MCA and 4,839 students for MBA.

Graduate Courses

The graduate course is of four years duration comprising eight semesters, except for Architecture, which is of five years duration. The first year of study is common to all engineering (B.E. / B.Tech.) disciplines. The students have to complete the B.E./B.Tech. course within 8 years and B.Arch. course within 10 years.

Bachelors degree in Engineering / Technology shall be awarded to the candidates who have passed all the stipulated examination from 1st to 8th semesters. However, declaration of the class of the degree shall be based on the performance of the candidate from 5th to 8th semester examinations taken together. We do not have a GPA scheme of Evaluation.

- *A candidate who passes all the subjects with 70% and above marks in aggregate in the 1st attempt of 5th to 8th semester shall be declared as First Class with Distinction.*
- *A candidate who passes all the subjects with between 60% and 70% of aggregate in the 1st attempt of 5th to 8th semester shall be declared as First Class.*
- *A candidate who passes all the subjects with less than 60% of aggregate marks in the 1st attempt of 5th to 8th semester shall be declared as Second Class.*

A candidate shall be eligible for a rank at the time of award of degree in each branch of Engineering / Technology, considering *the cumulative aggregate of first attempt marks secured by the candidate from 5th semester to 8th semester,* **provided the candidate has:**

a. *Passed in all the subjects from 1st to 8th semester in 1st attempt only.*
b. *Not repeated/rejected any of the lower semesters.*
c. *Completed the course within 4 academic years.*

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Candidate: Abhik Ghosh **University Seat No:** 1RN05EE001
Institution: R. N. S. Institute of Technology, Bangalore
Degree: Bachelor of Engineering in Electrical & Electronics Engineering
Class of Degree: First Class with Distinction.

REGISTRAR (EVALUATION)

Phone: 91-831-2405461, 2405473 Fax: 91--831-2405464.
Website : www.vtu.ac.in for enquiry: re@vtu.ac.in.

Sl. No. 23269

JSW Energy Centre of Excellence
(Recognized by Central Electricity Authority, Govt. of India)

JSW Energy Limited, P B No. 9, Toranagullu - 583 123, Dist. Bellary, Karnataka, India.

M.S. Ramaiah Institute of Technology
(Autonomous Institute Affiliated to Visvesvaraya Technological University)

M.S. Ramaiah Nagar, Bangalore - 560 054, Karnataka, India.

Certificate

Post Graduate Diploma in Power Plant Engineering

Issued as per the provisions of Indian Electricity (Amendment) Rules, 1981, Central Electricity Authority, Govt. of India

This is to certify that Mr. / Ms. ***ABHIK GHOSH***

Son / Daughter of Shri ***MAYA PADA GHOSH*** *has successfully completed one year Post Graduate Diploma in Power Plant Engineering from JSW Energy Centre of Excellence, JSW Energy Limited, Toranagallu, Bellary Dist. Karnataka, India in the Year* ***2009 - 2010***

Date: 16-8-2010

In charge JSWECE

Principal - MSRIT

This Diploma authorizes the certificate holder to operate or undertake maintenance of any part or whole of a generating station of capacity 100 MW and above together with the associated sub-station

JSW Energy Centre of Excellence

JSW Energy Limited
P. B. No. 9, Toranagallu P.O. - 583 123
Dist. Bellary, Karnataka, India.

Phone : 08395 - 250 222, 252 124
Fax : 08395 - 250 222, 250 757
E-mail : jswece@jsw.in
Website : www.jswel.net/jswece.html

TRANSCRIPT AS PER RECORDS

Name	: **ABHIK GHOSH**
Father / Mother's Name	: **MAYA PADA GHOSH**
Institute Seat No.	: **0109PGD01**
Year of Entrance	: **March 2009**
Year of Leaving	: **March 2010**
Course: **POST GRADUATE DIPLOMA IN POWER PLANT ENGINEERING**	

1. Duration of the Course : **1 Year**
2. Medium of Instruction : **English**
3. First class with distinction (FCD) : **70% of the total marks and above**
4. First class (FC) : **60% and above, but below 70% of the total marks**
5. Second class (SC) : **50% and above, but below 60% of the total marks**
6. Fail : **less than 50% of the total marks**

Semester: I

Sl No	SUBJECT		Examination Marks			Internal Assessment Marks			Total Marks			Module Result
	CODE	MODULE	Max	Min	Obtained	Max	Min	Obtained	Max	Min	Obtained	
01	PGDC 1	Industrial Safety, Energy Resources, Concepts of Thermal Power Station	100	50	92	50	25	48	150	75	140	PASS
02	PGDC 2	Boiler and their Auxiliaries	100	50	76	50	25	41	150	75	117	PASS
03	PGDC 3	Turbine and their Auxiliaries	100	50	96	50	25	42	150	75	138	PASS
04	PGDC 4	Generators, Electrical Auxiliaries and Control & Instrumentation	100	50	75	50	25	38	150	75	113	PASS
05	PGDC 5	Power Plant Chemistry & Pollution Control	100	50	92	50	25	42	150	75	134	PASS
06	PGDC 6	Scheme Briefing & Scheme Tracing	50	25	47	-	-	-	50	25	47	PASS
07	PGDC 7	Power Plant Operation, Protection & 300MW Simulator Training	50	25	46	-	-	-	50	25	46	PASS
GRAND TOTAL									**850**	**425**	**735**	

Total Marks Obtained (In words): SEVEN HUNDRED AND THIRTY FIVE **SEMESTER PERCENTAGE: 86.47%**
Result of the Semester: FIRST CLASS WITH DISTINCTION

Semester: II

Sl No	SUBJECT		Examination Marks			Internal Assessment Marks			Total Marks			Module Result
	CODE	MODULE	Max	Min	Obtained	Max	Min	Obtained	Max	Min	Obtained	
01	PGDC 8	NDT, Welding & Metallurgy	50	25	47	30	15	28	80	40	75	PASS
02	PGDC 9	Project Management & Plant Commissioning	50	25	43	30	15	28	80	40	71	PASS
03	PGDC 10	Maintenance Planning & Cost Control, Protections Interlocks	50	25	42	30	15	27	80	40	69	PASS
04	PGDC 11	Other Power Plant Technologies, Plant Performance and Monitoring	50	25	46	30	15	25	80	40	71	PASS
05	PGDC 12	Project Work	50	25	46	-	-	-	50	25	46	PASS
06	PGDC 13	On Job Training – Operations	50	25	46	-	-	-	50	25	46	PASS
07	PGDC 14	On Job Training - Maintenance	50	25	46	-	-	-	50	25	46	PASS
GRAND TOTAL									**470**	**235**	**424**	

Total Marks Obtained (In words): FOUR HUNDRED AND TWENTY FOUR **SEMESTER PERCENTAGE: 90.21%**
Result of the Semester: FIRST CLASS WITH DISTINCTION

Result of I & II Semesters:

Semesters :	I	II	I & II
Marks at First Attempt	735	424	1159
Total Marks (Max)	850	470	1320
Result	FCD	FCD	FCD

RESULT OF THE COURSE : FIRST CLASS WITH DISTINCTION
COURSE PERCENTAGE : 87.80%

Energy Centre of Excellence • JSW • Toranagallu

In-charge JSWECE

In-Charge
JSW Energy Centre of Excellence
OPJ Centre, Toranagallu-583 123.

About JSWECE:

JSW Energy Centre of Excellence (JSWECE) is established with a strong determination and vision to provide a world-class training facility to the Indian power sector by imparting high-quality training to the power sector professionals. It was started by **JSW Energy Ltd.**, the energy vertical of the dynamic USD 12 Billions JSW Group, in the year 2008.

JSW Energy Limited is having total installed capacity of 3, 140MW with a capacity of 8, 630MW under implementation and development at various locations. At Toranagallu (Vijaynagar), it is having units of 4x300MW and 2x130MW coal / gas-fired thermal power stations. JSW Energy Ltd. is recognized by Government of India and Government of Karnataka for its Excellence in Performance.

JSWECE is recognized by **Central Electricity Authority (CEA)**, a statutory body, under Ministry of Power, Government of India. This recognition empowers this Institute to conduct Power Plant Training Courses, meeting the high standards and requirements of the power sector professionals.

Post Graduate Diploma in Power Plant Engineering:

Apart from conducting training courses for the plant working Engineers, this Institute also conducts one year (52 weeks) **Post-Graduate Diploma Course in Power Plant Engineering** for Fresh Engineers in collaboration with **M S Ramaiah Institute of Technology,** a renowned autonomous Engineering College in Bangalore, Karnataka, India.

This **Post-Graduate Diploma Course in Power Plant Engineering** is exclusively designed to train fresh Graduate Engineers into power engineers, to carryout operation and Maintenance activities in Thermal Power Plants. This course also meets the specific mandatory requirements prescribed under Rule 3(2) of the ***Indian Electricity Rule*** *which stipulates* ***"No person shall be authorized to operate or undertake maintenance of any part or whole of generating station of capacity 100MW and above together with the associated sub-station, unless he adequately qualified and has undergone the specified training at a recognized institute."***

- Medium of Instruction: English

Grading system followed by the JSW Energy Centre of Excellence:

- Those obtaining 70% of the total marks and above: First Class with Distinction
- Those obtaining 60% and above, but below 70% of the total marks: First Class
- Those obtaining 50% and above, but below 60% of the total marks: Second Class
- Those obtaining less than 50% of the total marks: Fail

A student would be considered to have completed the course successfully, if he/she secures a **50%** marks in that course.

JSW Energy Centre of Excellence does not follow the GPA system of evaluation. Absolute marks are awarded on a percentage basis.

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Candidate: Abhik Ghosh
Institution: JSW Energy Centre of Excellence, Toranagallu
Course: Post Graduate Diploma in Power Plant Engineering
Class: First Class with Distinction

Institute Seat No.: 0109PGD01

Energy Centre of Excellence • MSR • Toranagallu •

In-charge JSWECE