



DEPARTMENT OF STATISTICS
SAURASHTRA UNIVERSITY
VALUE ADDED COURSE

(60 Hours with Theory & Practical)

ON

Data Science Using SAS

05/08/2018 TO 11/09/2018

Course: Data Science Using SAS

Course Outcomes:

On completion of the course, the student should be able to:

1. Critical SAS programming skills.
2. Accessing, transforming and manipulating data.
3. Improving data quality for reporting and analytics.
4. Fundamentals of statistics and analytics.
5. Working with Hadoop, Hive, Pig and SAS.
6. Exploring and visualizing data.

Course Content:

1. SAS Programs
2. Decision Making
3. SAS Functions
4. SAS Input Methods
5. SAS Macros
6. SAS DataSet Operations
7. SAS-SQL (CRUD)
8. SAS Output Delivery System
9. SAS Predictive Analytics

Reference Books:

1. An Introduction to SAS® University Edition By Ron Cody
2. A Gentle Introduction to Statistics Using SAS® Studio By Ron Cody

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(60 Hours with Theory & Practical)

ON

MACHINE LEARNING

27/07/2018 TO 09/09/2018

Course: Machine Learning

Course Outcomes:

On completion of the course, the student will gain following skills

1. Logistic Regression
2. Neural Network
3. Machine Learning Algorithms

Course Content:

1. Linear Regression with one variable
2. Linear Regression with multiple variables
3. MATLAB Tutorials
4. Logistic Regression
5. Regularization
6. Neural Networks: Representations

Reference Books:

1. Machine Learning for Hackers: Case Studies and Algorithms to Get You Started (1st Edition) by Drew Conway & John Myles
2. Machine Learning by Ethem Alpaydin
3. Pattern Recognition and Machine Learning by Christopher M. Bishop

DEPARTMENT OF STATISTICS
SAURASHTRA UNIVERSITY

VALUE ADDED COURSE

(60 Hours with Theory & Practical)

ON

Predictive Analysis Using R

28/07/2018 TO 09/09/2018

Course: Predictive Analysis Using R

Course Outcomes:

Students successfully completing the course will:

1. Gain understanding of the computational foundations in Big Data Science.
2. Develop critical inferential thinking.
3. Gather a tool chest of R libraries for managing and interrogating raw and derived, observed, experimental, and simulated big healthcare datasets.
4. Possess practical skills for handling complex datasets.

Course Content:

1. Linear Methods for Regression and Classification
2. Model Assessment and
3. Additive Models, Trees, and Boosting
4. Neural Networks (NN)
5. Unsupervised Learning and Random forests
6. Overview of R for Predictive Modeling
7. Study of various methods to build predictive classification models using decision trees, rather than regression models

Reference Books:

1. Mastering Predictive Analytics with R Paperback by Rui Miguel Forte
2. [Fundamentals of Database Systems, Global Edition Ramez Elmasri](#)
3. [Fundamentals of Database Systems, Global Edition Kindle Edition by Ramez Elmasri](#)

DEPARTMENT OF STATISTICS

SAURASHTRA UNIVERSITY

VALUE ADDED COURSE

(60 Hours with Theory & Practical)

ON

DATA MINING USING SQL

27/07/2018 TO 11/09/2018

Course: Data Mining Using SQL

Course Outcomes:

This course covers fundamental concepts of database and information systems. These concepts include database modelling and design, relational databases, querying and SQL, object-based databases, XML and web databases, data storage, transactions, database system architectures, data mining and warehousing techniques, client/server paradigm, middleware, ODBC, JDBC, CORBA, privacy, integrity, and security

Course Content:

1. Introduction
2. Data modelling: physical, logical and conceptual data models, the entity-relationship model
3. The relational database model, Hierarchical model, Network Model
4. Relational database design, functional dependencies, and normalization, Multi-valued dependencies
5. SQL query language and Relational algebra
6. What is SQLData Mining?
7. Parameters for Data Mining
8. Tools and Techniques Used for Data Mining in SQL
9. Several Phases of Data Mining in SQL Development
 - a. Problem Definition
 - b. Data Preparation
 - c. Data Exploration
 - d. Data Mining Model Development
10. Data Mining Applications

Reference Books:

1. T. Hastie, R. Tibshirani, and J. Friedman (2001) *The Elements of Statistical Learning: data mining, inference and prediction*. Springer Verlag.
2. *Principles of Data Mining* (D. Hand, H. Mannila, and P. Smyth, MIT Press, 2001) J. Han and M. Kamber (2000) *Data mining: concepts and techniques*. Morgan Kaufman.
3. Gordon S. Linoff & Michael J. A. Berry *Data Mining Techniques: For Marketing, Sales, and Customer Relationship Management*
4. Ben Klemens *Modeling With Data*

**DEPARTMENT OF STATISTICS
SAURASHTRA UNIVERSITY**

VALUE ADDED COURSE

(60 Hours with Theory & Practical)

ON

Regression Analysis

05/08/2018 TO 11/09/2018

Course: Regression Analysis

Course Outcomes:

On completion of the course, the student should be able to:

1. formulate simple and multiple regression models;
2. give an account of the principle of least squares;
3. carry out tests of linear hypothesis;
4. perform validation of a regression model;
5. select the important explanatory variables;
6. use R for analysing real data sets;
7. be able to interpret the results in practical examples.

Course Content:

1. Simple linear regression
2. Multiple linear regression
3. Variable selection
4. F-tests. Least-squares estimation
5. Collinearity. Residual analysis
6. Nonlinear regression
7. R commands

Reference Books:

1. Keith, T. Z. (2015). *Multiple regression and beyond* (2nd ed.). New York: Routledge.
2. Fox, J. (2016). *Applied regression analysis & generalized linear models* (3rd ed.). Thousand Oaks, CA: Sage.
3. Fox, J. & Weisberg, S. (2011). *An R companion to applied regression* (2nd ed.). Thousand Oaks, CA: Sage

The background features a normal distribution curve with three overlapping bell curves in blue, green, and red. The x-axis is labeled from -6 to 6. Vertical lines represent process specifications: LSL at -6 and USL at 6. A central vertical line is at 0. The area under the curve is divided into six sigma levels, with labels for $\mu \pm 0.5\sigma$, $\mu \pm 1\sigma$, $\mu \pm 1.5\sigma$, $\mu \pm 2\sigma$, $\mu \pm 2.5\sigma$, and $\mu \pm 3\sigma$. Text boxes provide data for the fraction of area left of LSL and right of USL for each sigma level.

DEPARTMENT OF STATISTICS
SAURASHTRA UNIVERSITY

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ON

SIX SIGMA

27/07/2018 TO 09/09/2018

Course: Six Sigma

Course Outcomes:

Student become proficient in all of the analytical tools necessary to define, measure, analyze, improve, and control Lean **Six Sigma** improvement projects, including the design and analysis of general and fractional factorial experiments. You will learn team leadership and project management skills.

Course Content:

1. Basics of Six Sigma
2. Fundamentals of Six Sigma
3. Selection of Six Sigma Projects
4. Six Sigma Statistics
5. Measurement System Analysis
6. Process Capability
7. Patterns of Variation
8. Inferential Statistics
9. Six Sigma Control Plans

Reference Books:

1. The Certified Six Sigma Black Belt Handbook By T.M. Kubiak and Donald W. Benbow
2. The Lean Six Sigma Pocket Toolbook By Michael L. Jones and John Maxey
3. [Lean Six Sigma For Dummies](#) by John Morgan (Author), Martin Brenig-Jones



Center of Excellence

“SUMMER TRAINING PROGRAM”

THIS IS TO CERTIFY THAT **MS. GOL DHRUVITA HARESHBHAI** FROM **SHREE M & N VIRANI SCIENCE COLLEGE (AUTONOMOUS COLLEGE)**, HAS PARTICIPATED IN SUMMER TRAINING PROGRAM ON “GAS CHROMATOGRAPH (GC-MS, HS-GC FID)” DURING 10TH MAY TO 10TH JUNE, 2018 ORGANIZED BY CENTER OF EXCELLENCE, DEPARTMENT OF CHEMISTRY, SAURASHTRA UNIVERSITY, RAJKOT.



Dr. Madhavi Patel
(Assistant Director, CoE)

Dr. Bipin Pandey
(Director, CoE)

NATIONAL WORKSHOP ON FRONTIERS OF NMR SPECTROSCOPY: “ NUCLEUS TO NUCLEOTIDES ”

at

Center of Excellence, NFDD Complex, Department of Chemistry,
Saurashtra University, Rajkot-360005

Duration: 7 Days, Jan 15-21, 2016

Objectives of the workshop: To create the awareness in the area of principles and interdisciplinary applications of NMR among young researchers.

Program

15th January 2016			
Inauguration 9:00-9:30			
Lecture 1	09:30	Historical Developments of NMR	C. L. Khetrapal
Lecture 2	10:15	NMR Spectroscopy Principles	N. Suryaprakash
	11:00	Tea	
Lecture 3	11:30	Chemical Shifts and J Couplings	N. Suryaprakash
Lecture 4	12:15	Relaxation Phenomenon and their Measurement	N. Suryaprakash
	13:00	Lunch	
Lecture 5	14:00	Examples of Analysis of spectra of different Hetero Nuclei	N. Suryaprakash
Lecture 6	14:45	Two Dimensional NMR	N. Suryaprakash
	15:30	Tea	
Lecture 7	15:45	Practical Aspects of NMR Data acquisition and processing	N. Suryaprakash
Lecture 8	16:30	Analysis of ¹ H NMR Spectra	N. Suryaprakash
16th January, 2016			
Lecture 9	09:00	Multinuclear NMR	C.L.Khetrapal
Lecture 10	09:45	Homo and Heteronuclear Decoupling	N. Suryaprakash
	10:30	Tea	
Lecture 11	11:00	Nuclear Overhauser Effect and its Applications	N. Suryaprakash
Lecture 12	11:45	Liquid Crystal NMR	C.L. Khetrapal

	12:30	Lunch	
Lecture 13	14:00	Multiple Quantum NMR	N. Suryaprakash
Lecture 14	14:45	Fundamentals of Solid State NMR	N. Suryaprakash
	15:30	Tea	
Lecture 15	15:45	Sensitivity enhancement and editing	N. Suryaprakash
Lecture 16	16:15	Principles of Solid State NMR	N. Suryaprakash
17th January, 2016			
Lecture 17	09:00	Magic Angle Spinning and CP	N. Suryaprakash
Lecture 18	09:45	2D experiments in Solid State	N. Suryaprakash
	10:30	Tea	
Lecture 19	11:00	Applications of Solid State NMR	N. Suryaprakash
Lecture 20	11:45	Chiral Analysis by NMR	N. Suryaprakash
	12:30	Lunch	
Lecture 21	14:00	Hydrogen Bonding by NMR	N. Suryaprakash
Lecture 22	14:45	Advanced 2D Techniques in Liquid State	N. Suryaprakash
	15:30	Tea	
Lecture 23	16:00	Principles of Magnetic Resonance	N. Suryaprakash
		Imaging	
18th January, 2016			
Lecture 24	09:00	Protein Structure Determination -I	H.S. Atreya
Lecture 25	09:45	Protein Structure Determination -II	H.S. Atreya
	10:30	Tea	
Lecture 26	11:00	NMR In Biology - I	H.S. Atreya
Lecture 27	11:45	NMR in Biology-II	H.S. Atreya
	12:30	Discussion	
	13:00	Lunch	
Lecture 28	14:00	Heteronuclear 2D of Biomolecules - I	H.S. Atreya
Lecture 29	14:45	Heteronuclear 2D of Biomolecules - II	H.S. Atreya
	15:30	Tea	
Lecture 30	15:45	3D NMR -I	H.S. Atreya
Lecture 31	16:15	3D NMR-II	H.S. Atreya
19st January, 2016			
Lecture 32	09:00	Fast NMR Methods - I	H.S. Atreya
Lecture 33	09:45	Fast NMR Methods - II	H.S. Atreya
	10:30	Tea	
Lecture 34	11:00	Isotope Labeling Methods -I	H.S. Atreya
Lecture 35	11:45	Isotope Labeling Methods -II	H.S. Atreya

	12:30	Discussion	
	13:00	Lunch	
Lecture 36	14:00	Nucleic Acid NMR-I	H. S. Atreya
Lecture 37	14:45	Nucleic Acid NMR-II	H. S. Atreya
	15:30	Tea	
Lecture 38	15:45	NMR Based Metabonomics -I	H S Atreya
Lecture 39	16:15	NMR Based Metabonomics -II	H.S. Atreya
20th January,2016			
Lecture 40	09:00	Demostration of Instruments-I	Uday Prabhu
	10:30	Tea	
Lecture 41	11:00	Demostration of Instruments-II	Uday Prabhu
Lecture 42	11:45	NMR processing	Uday Prabhu
	12:30	Discussion	
	13:00	Lunch	
Lecture 43	14;00	1D NMR experiments	Uday Prabhu
Lecture 44	14:45	2D NMR experiments	Uday Prabhu
	15:30	Tea	
21st January,2016			
Lecture 45	09:00	Intigration and Interpretation -1D NMR	Uday Prabhu
Lecture 46	09:45	Intigration and Interpretation -2D NMR	Uday Prabhu
Lecture 47	09:45	Experimental Protocols-I	Uday Prabhu
	10:30	Tea	
Lecture 48	11:00	Multinuclear NMR	Uday Prabhu
	12:30	Discussion	
		Lunch	
		Valedictory Session	

Organized by,
Center of Excellence, NFDD Complex, Department of
Chemistry,
Saurashtra University, Rajkot-360005
www.coenfdd.com
analyticalnfdd@gmail.com
coeanalytical@gmail.com

25th September, 2017
 Venue:- Centre of Excellence, NFDD,
 Department of Chemistry, Rajkot

Lecture 1	10:30-11:30	Principles of NMR Spectroscopy	N. Suryaprakash
Lecture 2	11:30-12:30	NMR Interaction Parameters	N. Suryaprakash
	12:30-12:45	Break	
Lecture 3	12:45-13:45	Analysis of ¹ H Spectra : Representative examples	N. Suryaprakash
Lecture 4	13:45-14:00	Decoupling and NOE	N. Suryaprakash
	14.00-15:00	Lunch	
Lecture 5	15:00-16:00	Multinuclear NMR and their Analysis	N. Suryaprakash
	16.00-16:15	Tea	
Lecture 6	16:15-17:15	T1/T2: Mechanisms & Measurements	N. Suryaprakash

26 th September, 2017			
Lecture 7	10:00-11:00	Multiple Quantum NMR	N. Suryaprakash
Lecture 8	11:00-12:00	Polarization Transfer Techniques	N. Suryaprakash
	12:00-12:15	Tea	
Lecture 9	12:15-13:15	2D NMR Techniques	N. Suryaprakash
Lecture 10	13:15-14:15	Analysis of 2D Spectra, COSY, TOCSY, HSQC, etc.	N. Suryaprakash
		with representative examples	
	14:15-15:00	Lunch	
Lecture 11	15:00-16:00	Chemical Applications of NMR: Study of Hydrogen Bonding	N. Suryaprakash
	16:00-16:15	Tea	
Lecture 12	16:15-17:15	Chemical Applications of NMR : Chiral Analysis	N. Suryaprakash

27 th September, 2017			
Lecture 13	10:00-11.00	Solid State NMR : General Concepts, MAS and CP	K.V. Ramanathan
Lecture 14	11.00-12.00	2D Techniques in Solid State	K.V. Ramanathan
	12.00-12:15	Tea	
Lecture 15	12:15-13.15	Applications of Solid State NMR	K.V. Ramanathan
Lecture 16	13.15-14.15	NMR based Metabolomics	H.S. Atreya
	14.15-15.00	Lunch	
Lecture 17	15.00-16.00	3D NMR Techniques	H.S. Atreya
	16.00-16.15	Tea	
Lecture 18	16.15-17.15	Isotope Labelling Techniques	H.S. Atreya

28 th September, 2017			
Lecture 19	10:00-11.00	NMR In Biology - I	H.S. Atreya
Lecture 20	11.00-12.00	NMR in Biology - II	H.S. Atreya
	12.00-12:15	Tea	
Lecture 21	12:15-13.15	Heteronuclear 2D of Biomolecules	H.S. Atreya
Lecture 22	13.15-14.15	Fast NMR Methods	H.S. Atreya
	14.15-15.00	Lunch	
Lecture 23	15.00-16.00	3D NMR and Protein Structure Determination-I	RV Hosur
	16.00-16.15	Tea	
Lecture 24	16.15-17.15	3D NMR and Protein Structure Determination-II	R.V. Hosur

29 th September, 2017			
Lecture 25	10:00-11.00	Nucleic Acids NMR -I	R.V. Hosur
Lecture 26	11.00-12.00	Nucleic Acids NMR -II	R.V. Hosur
	12.00-12:15	Tea	
Lecture 27	12:15-13.15	Basics of Magnetic Resonance Imaging	N.R. Jagannathan
Lecture 28	13.15-14.15	Applications of MRI, including functional MRI	N.R. Jagannathan
	14.15-15.00	Lunch	
Lecture 29	15.00-16.00	In-vivo MR Spectroscopy in clinical research	N.R. Jagannathan
Lecture 29	16.00-17.15	In-vivo MR Spectroscopy in clinical research	N.R. Jagannathan
		Tea followed by valedictory	



UGC-SAP SPONSORED
5 DAYS NATIONAL WORKSHOP ON
"FRONTIERS OF NMR SPECTROSCOPY AND MRI"



GRADE "A" by NAAC

Jointly Organized by

SHREE M. & N. VIRANI
SCIENCE COLLEGE (AUTONOMOUS), RAJKOT

DEPARTMENT OF CHEMISTRY
SAURASHTRA UNIVERSITY, RAJKOT

THIS IS TO CERTIFY THAT PROF./DR./MR./MRS./MS. _____ HAS PARTICIPATED
IN THE 5 DAYS NATIONAL WORKSHOP ON "FRONTIERS OF NMR SPECTROSCOPY AND MRI" DURING 25TH SEPTEMBER, 2017

Prof. Shipra Baluja
Co-Convener

Dr. K.D. Ladva
Co-Convener

Dr. R. C. Khunt
Organizing Secretary

Prof. H. S. Joshi
Convener

11th July - 2018		
Time	Topic	Speaker
8:30-9:30	Registration & Break fast	
9:30-10:00	Inaugural Ceremony	
10:00-12	Basics of NMR & 1D NMR	N. Suryaprakash
12:15-12:30	Tea	
12:30-14.00	Principles and Applications of Solid State NMR	K V Ramanathan
14.00-15:00	Lunch	
15:00-17.00	Basic & Analysis of 2D NMR	N. Suryaprakash
17.00 -17.15	Tea	
17.15 to 18.15	Analysis of 2D NMR	N. Suryaprakash
12th July – 2018		
Time	Topic	Speaker
9:00-10:00	Break Fast	
10:00-12	Protein NMR	R. V. Housar
12:15-12:30	Tea	
12:30-14.00	NMR Based Metabolomics	R. V. Housar
14.00-15:00	Lunch	
15:00-17.00	Instrument Demonstration and Practical	R. C. Khunt
17.00 -17.15	Tea	
17.15 to 19.00	Instrument Demonstration and Practical	R. C. Khunt
13th July – 2018		
Time	Topic	Speaker
9:00-10:00	Break Fast	
10:00-12	Principles of MRI	Subhash Khusu
12:15-12:30	Tea	
12:30-14.00	Applications of MRI	Subhash Khusu
14.00-15:00	Lunch	
15:00-18.00	Instrument Demonstration and Practical	R. C. Khunt
18.30-19.00	Valedictory Function	



NATIONAL MAGNETIC RESONANCE SOCIETY

Commemorating 25 years of NMR activities with National Workshops at

Rajkot, Chennai, Behrampur, Darjeeling, IIT Roorkee



GUJ-COST



Department of Chemistry
Saurashtra University



H. N. Shukla
Group of College

Certificate of Attendance

This is to certify that

has attended the Silver Jubilee NMRS Workshop held during July 11-13, 2018 at
Saurashtra University, Rajkot

Dr. Ranjan Khunt
Convener, NMRS
Workshop, Rajkot

Dr. Mehul Rupani
Principal
H.N.S Group of Colleges

Prof. H. S. Joshi
Prof. & Head, DOC,
SU, Rajkot

Prof S. Subramanian
President, NMRS



NATIONAL MAGNETIC RESONANCE SOCIETY

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Rajkot, Chennai, Behrampur, Darjeeling, IIT Roorkee



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Saurashtra University, Rajkot

A handwritten signature in black ink, appearing to read 'Dr. Ranjan Khunt', written over a light blue background.

Dr. Ranjan Khunt
Convener, NMRS Workshop, Rajkot

A handwritten signature in black ink, appearing to read 'Prof. S. Subramanian', written over a light blue background.

Prof S. Subramanian
President, NMRS

NMR School – 2018

(11th to 13th July)

Sponsored by

GUJ-COST



Jointly Organized by



**NMRS
BENGALURU**

**Department of Chemistry
&
Center of Excellence
Saurashtra University**

**Shree H. N. Shukla
Group of Colleges**

Chief Patron

Prof. N. R. Dave
Vice Chancellor, SU

Key Note Speaker

Prof. N. Suryaprakash
IISc Bengaluru

Resource Persons

**Prof. H. Atreya
Prof. K. V. Ramnathan
Prof. S. Subramanian**

Invitees

Dr. Dhiren Pandya
Registrar
Saurashtra University

Dr. Mehul Rupani
Dean, Faculty of Science
Saurashtra University

Prof. H. S. Joshi
Prof. & Head
Department of Chemistry
Saurashtra University

:: Venue ::

**NFDD Auditorium
Department of Chemistry
Saurashtra University, Rajkot**

Program Schedule

Time	11 th July	12 th July	13 th July
8:30 to 9:30	Registration & Break Fast	Break Fast	Break Fast
9:30 to 10:00	Inaugural Ceremony	-	-
10:00 to 11:30	Basics of NMR & 1D NMR	Protein NMR	Principals of MRI
11:30 to 11:45	Tea	Tea	Tea
11:45 to 13:15	Basic & Analysis of 2D NMR	NMR Based Metabolomics	Applications of MRI
13:15 to 14:30	Lunch	Lunch	Lunch
14:30 to 16:00	Principals of Solid State NMR	Instrument Demonstration	Valedictory Function
16:00 to 16:15	Tea	Tea	-
16:15 to 17:45	Applications of Solid State NMR	Instrument Demonstration	-

:: Organizing Convener ::

**Dr. R. C. Khunt (EC-Member, NMRS)
Asst. Professor, Department of Chemistry
Saurashtra University**

:: Local Organizing Committee ::

**Prof. Shipra Baluja
Dr. M. K. Shah
Dr. F. D. Karia**

**Prof. Y. T. Naliyapara
Dr. U. C. Bhoya
Dr. MinaxiMaru**

:: For Application Form ::



Visit: <http://nmrs.iisc.ernet.in/ws.htm>

(Preference will be given to Faculties, Research and Post-Graduate students applying from the Gujarat region)