NATIONAL INSTITUTE OF TECHNOLOGY
ROURKELA

Senate Meeting Minutes

MEETING No. : : 55th Senate Meeting

DATE : : 14.09.2015 (Monday)

TIME : : 4.30 PM

VENUE : : New Senate Hall, NIT, Rourkela

To : _____

_____

Dept./Centre : _____

राष्ट्रीय प्रौद्योगिकी संस्थान राउरकेला
NATIONAL INSTITUTE OF TECHNOLOGY ROURKELA

Minutes
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राष्ट्रीय प्रौद्योगिकी संस्थान, राउरकेला
NATIONAL INSTITUTE OF TECHNOLOGY, ROURKELA

Minutes of the 55th meeting of the Senate of the Institute held on 14.09.2015 (Monday) in the New Senate Hall, N.I.T. Rourkela.

Members present:

1	Prof. Sunil Kr Sarangi, Director	-	Chairman, Senate
2	Mr. S. K. Upadhyay, Registrar	-	Secretary, Senate
3	Prof. B. K. Mishra Ex-Professor, Department of Chemistry, Sambalpur University, Jyoti Vihar, Sambalpur, Odisha	-	Member
4	Prof.(Ms.) Krishna Pramanik, BM	-	Member
5	Prof. N Roy, CE	-	Member
6	Prof. S P Singh, CE	-	Member
7	Prof. K C Patra, CE	-	Member
8	Prof. S K Sahu, CE	-	Member
9	Prof. C R Patra, CE	-	Member
10	Prof. R K Singh, CH	-	Member
11	Prof. P Rath, CH	-	Member
12	Prof. S Bhattacharyya, CR	-	Member
13	Prof. Japesh Bera, CR		Member
14	Prof. B Majhi, CS	-	Member
15	Prof. S K Jena, CS	-	Member
16	Prof. S Meher, EC	-	Member
17	Prof. K K Mahapatra, EC	-	Member
18	Prof. S K Patra, EC	-	Member
19	Prof. A K Panda, EE	-	Member
20	Prof. B Subudhi, EE	-	Member
21	Prof. K C Pati, MA	-	Member
22	Prof. G K Panda, MA	-	Member
23	Prof. A Behera, MA	-	Member
24	Prof. S Chakraverty, MA	-	Member
25	Prof. S K Sahoo, ME	-	Member
26	Prof. B K Nanda, ME	-	Member
27	Prof. K Maity, ME	-	Member
28	Prof. S S Mohapatra, ME	-	Member
29	Prof. D R K Parhi, ME	-	Member
30	Prof. S K Acharya, ME	-	Member

31	Prof. S C Mishra, MM	-	Member
32	Prof. D P Tripathy, MN	-	Member
33	Prof. S Panigrahi, PH	-	Member
34	Prof. B B Biswal, ID	-	Member
35	Prof. M K Gupta, Head, BM	-	Invitee
36	Prof. B B Nayak, Head, CR	-	Invitee
37	Prof. N Panda, Head, CY	-	Invitee
38	Prof. Md. Equinnuddin, Head, ER	-	Invitee
39	Prof.(Ms.) B Patnaik, Head, HS	-	Invitee
40	Prof. Md. Rajik Khan, Head, ID	-	Invitee
41	Prof. S K Bhutia, Head, LS	-	Invitee
42	Prof. M K Mishra, Head, MN	-	Invitee
43	Prof. (Mrs.) Ankhi Banerjee, Head, PA	-	Invitee
44	Prof. D K Bisoyi, Head, PH	-	Invitee
45	Prof. C K Sahoo, Head, SM	-	Invitee
46	Mr. B Acharya, Dy. Registrar (AC)	-	Invitee
47	Mr. A K Behera, Asst: Registrar (AC)	-	Invitee

Members Absent:

1	Prof. (Mrs.) Kalyani Mishra Former Reader Government Autonomous College, Rourkela	-	Member
2	Prof. Sidhartha Mukhopadhyay Department of Electrical Engineering, IIT, Kharagpur	-	Member
3	Prof. M Panda, CE	-	Member
4	Prof. K C Biswal, CH	-	Member
5	Prof. S K Agarwal, CH	-	Member
6	Prof. S K Rath, CS	-	Member
7	Prof. J K Satapathy, EE	-	Member
8	Prof. R K Sahoo, ME	-	Member
9	Prof. B C Ray, MM	-	Member
10	Prof. B B Verma, MM	-	Member
11	Prof. S Jayanthu, MN	-	Member
12	Prof. B K Pal, MN	-	Member
13	Mr. K S S Vamsivadi, 112EE0510	-	Student Invitee
14	Mr. Sobhan Kanti Dhara, 213EC6259	-	Student Invitee

Leave of absence was approved for all members absent.

2015-55-Senate-01: **Welcome to the members and invitees by the Chairman.**

The Chairman welcomed all Senators and Invitees and apprised about the reason for calling an emergency meeting.

PART – I: WITH STUDENT INVITEES

2015-55-Senate-02: **To confirm the minutes (Part – I) of 54th meeting of the Senate held on 10.06.2015 (Wednesday) and 12.06.2015 (Friday).**

The draft minutes (Part – I) of 54th meeting of the Senate, provisionally approved by the Chairman, Senate were circulated to all members. Since no comments/suggestions on the correctness of the recording of the minutes have been received from any member, *Senate confirmed the minutes.*

2015-55-Senate-03: **Report on Action Taken on the decision of 54th meeting (Part-I) of the Senate held on 10.06.2014 (Wednesday) and 12.06.2015 (Friday).**

The Senate noted the report on the action taken on the decisions made in the 54th meeting (Part–I) of the Senate held on 10.06.2015 and 12.06.2015

[Annexure A1, Pg. No. 8]

PART – II : WITHOUT STUDENT INVITEES

2015-55-Senate-04: **To confirm the minutes (Part – II) of 54th meeting of the Senate held on 10.06.2015 (Wednesday) and 12.06.2015 (Friday).**

The draft minutes (Part – II) of 54th meeting of the Senate, provisionally approved by the Chairman, Senate were circulated to all members. Since no comments/suggestions on the correctness of the recording of the minutes have been received from any member, *Senate confirmed the minutes.*

2015-55-Senate-05: **Report on Action Taken on the decision of 54th meeting (Part-I) of the Senate held on 10.06.2015 (Wednesday) and 12.06.2015 (Friday).**

The Senate noted the report on the action taken on the decisions made in the 54th meeting (Part–II) of the Senate held on 10.06.2015 and 12.06.2015.

[Annexure A2, Pg. No. 9]

A. RULES, PROCEDURES, CURRICULA AND POLICY MATTERS:

2015-55-Senate-06: **Syllabi for M. Tech. in Analytics and Decision Sciences programme.**

The Curriculum and Syllabus of M. Tech. in Analytics and Decision Sciences programme was put up to the Senate for consideration.

The Senate provisionally approved the Curriculum and Syllabi of M. Tech. in Analytics and Decision Sciences programme to be effective from Autumn 2015-16. Also the Senate decided that the said programme is a multi-disciplinary programme with the involvement of the departments of Computer Science & Engineering (CS), Mathematics (MA) and School of Management (SM). The department of Computer Science & Engineering (CS) will be host department.

The Senate further advised Dean (Academic) to discuss with DACs of the above mentioned departments as to involve industry to improve the curriculum and syllabi of the programme.

[Annexure A3, Pg. No. 10 - 20]

2015-55-Senate-07: **MoU signed between UNC Charlotte, USA and NIT Rourkela.**

The Senate, in principle, recommended the draft MoU proposed to be signed between NIT Rourkela and UNC Charlotte, USA. The Senate further advised the Registrar to look into the legal aspects of the MoU and put up to the Chairman, Senate for consideration, after which the draft MoU will be put up to the BOG for approval.

[Annexure A4, Pg. No. 21 - 25]

B. UNDERGRADUATE AND POSTGRADUATE STUDIES

Nil

C. RESEARCH STUDIES:

Nil

D. DISCIPLINE, ENDOWMENT AND STUDENT AFFAIRS

2015-55-Senate-08: **Reports on Student disciplinary cases - Case of theft of laptops**

Chairman, Senate apprised the Senate about the direction of the Hon'ble High Court of Odisha in the matter of Sri Debasish Dhall vs NITR and Others and also informed that as per the direction of Hon'ble High Court and based on the representation of students he allowed them to attend classes pending decision by the Senate.

The Senate went through the direction of Hon'ble High Court of Odisha and also the recommendation of ISDC dated 11.09.2015 in the matter of Laptop/Bicycle theft case and approved the following recommendation of ISDC; details are given in the ***annexure****.*

"

1.	*Rinku Raj, (113FT0518)* *Rakesh Biswal (413MA5057)* *Debasish Dhal (112BT0019)*	*Expulsion from the Institute for one semester (Autumn 2015-16)*
2.	*Deepak Panigrahi (112CR0501)* *K.Anil Kumar Rathod (112CE0452)* *Madhu Sudan Sethy (112CE0060)*	*Expulsion from the Institute for one year (Academic year 2015-16)*

In addition, the following supplementary penalties may be added for all six students:

i) P-17: Placement facility withdrawn totally (Cancellation of offers to final year student if already given).

ii) P-6: Debarment from Medals & prizes linked to academic performance, and prizes (e.g. Sports Blues, Best Sports person of a year) based on cumulative performance.

iii) P-3: Debarment from elected offices and captaincy of sports teams.

iv) A financial penalty of Rs.50,000/- each may also be imposed on above six students, the collection being spent on student welfare.

4. There shall be no adverse entry in the conduct certificate of the student.

5. If in future their fresh involvement in such activity is established, the original penalty of total expulsion from Institute will be implemented.

6. All the above students and their parents need to give undertaking to the effect that he (his ward) will not be involved in any such activity in future. If any such involvement will be established against him (his ward), the original penalty of total expulsion from Institute will be implemented."

The decision of the Senate should be communicated to the students at the earliest. Since all six students are debarred from registering for courses in current semester, the provisional permission granted to them for attending

classes shall be withdrawn. Students expelled for one year will be required to vacate hostels within one week. Students having F grades shall not be permitted to sit for backlog papers in Autumn 2015-16 (for First Group) and in Academic Year 2015-16 (Second Group). They are however permitted to sit for same papers in Academic Year 2016-17.

[Annexure A5, Pg. No. 26 - 35]

E. MISCELLANEOUS: -

2015-55-Senate-09: **Allegation of Plagiarism published in Newspaper**

Refer to Page 7A | Page

2015-55-Senate-10 **: MoUs with reputed Universities and Organizations.**

The Senate, in principle, recommended the following draft MoUs to be signed between NIT Rourkela with the following reputed universities and organizations. The Senate advised the Registrar to look into the legal aspects of the MoUs and put up to the Chairman, Senate for consideration, after which the draft MoU will be put up to the BOG for approval.

i) AIESECs (An International Organization of Students) Kolkatta Office.
ii) New York University School of Medicine, New York City
iii) School of Oral and Dental Science, University of Bristol, Bristol, UK

The Senate further advised that the Institute should explore the possibility of framing a standard format for MoU of NIT Rourkela and get it cleared by institute advocate for frequent use.

[Annexure – A7, Page No. 46 - 47]

2015-55-Senate-~~18~~ 11: Training & Placement Leave for Placement Coordinators

The Senate approved the following proposal of PIC – Training & Placement for increasing the limit of Placement leave granted to Student representatives acting as Placement Coordinators (PC) in view of their involvement in different placement activities:

Students representatives	***Placement Leave***
Placement Coordinators (16 nos.)	*09 leave for 3 credits* *12 leave for 4 credits* *03 leave for 2 credits*
Placement Coordinators (Core Group-5 nos.)	*12 leave for 3 credits* *16 leave for 4 credits* *03 leave for 2 credits*

i) The leaves are inclusive of the basic concession of 2 X credits for Theory or 2 Labs.

ii) Overall constraint on total absence to be honoured.

[Annexure – A8, Page No. ~~48~~ 48]

2015-55-Senate-~~19~~ 12 : Semester evaluation of UG students taken admission in Special Round counselling through CSAB – 2015.

As some students have taken admission to different UG programmes upto 30th August 2015 through Special Round Counselling, the Senate decided that the semester evaluation of these students will be done on the basis of giving 80% weightage to the End-semester and 20% weightage to teacher's assessment. These students are exempted from mid-semester examinations.

The next meeting of the Senate will be held in the **November 2015.** The date will be finalized in consultation with Chairman, Senate.

The meeting ended with thanks to the Chair.

(S.K. Upadhyay)
Registrar and
Secretary, Senate

Bmajhi 05/10/2015

(B. Majhi)
Dean (Acad.)

(Sunil Kr. Sarangi)
Director and
Chairman, Senate
2015/10/05

Contd on Page 7A for item 09
2015-55-Senate-~~18~~ 11

2015-55-Senate-16: Allegation of Plagiarism Published in Newspaper

Prof. M K Gupta, HOD, BM, through an email addressed to the Director had requested discussion on newspaper report referring to possible plagiarism in a Ph.D. thesis. Director, in capability of Chairman Senate, had addressed Registrar not to include in agenda of discussion and he proposed to discuss personally with Prof. Gupta. Registrar, however, had circulated the contents of Prof. Gupta's email as supplementary agenda in defiance of Chairman's directives.

The chair decided to permit discussion on the subject.

Prof. Gupta, HOD, BM presented the case on "Allegation of Plagiarism" on the Ph.D. thesis of Dr. Bibhukalyan Prasad Nayak. He referred to the news item published in an English daily 'Indian Express' dated 28.08.2015. He condemned that this was a serious allegation which is baseless without scientific merit.

Chairman, Senate advised Prof. Gupta to counter the allegation published in the said newspaper, if he thought it to be inappropriate.

Annexure. 46 (P-36)

(Prof B.B. Nayak)
Dean (AC)

(Sunil Kr Sarangi)
(Director and Chairman Senate)

Annexure A1

Action taken report (Part – I)

Minutes Sl. No of 54th meeting	Subject	Action taken
2015-54-Senate-02	Confirm the minutes (Part – I) of 53rd meeting of the Senate:	
	a) Changes in the Academic Calendar for the session 2015-16	Changes incorporated and being implemented
	a) Changes in the Committee members for the session 2015-16	Changes incorporated and being implemented
2015-54-Senate-03	Report on Action Taken on the decision of 53rd meeting (Part-I) of the Senate:	
	a) 2015-52-Senate-20(2): Collaborative course on M. Tech. (Safety Engg.):	Implemented
	b) 2015-53-Senate-07: Proposal to change the name of M.Sc. programme in Ocean and Atmospheric Sciences	Implemented
	c) Synopsis Seminar of PhD/M.Tech(Res) students	Dean(Ac) has already emailed to all faculty members
	d) Semester evaluation on Research credit:	To be Implemented in Autumn 2015-16
2015-54-Senate-04	*Proposal on assigning supervisor when the Principal supervisor proceeds on long leave, retires or resigns from service*	Implemented
2015-54-Senate-05	*Proposal for Selection of Ph.D., M.Tech(Res) and PDFs in the departments*	Implemented
2015-54-Senate-06	*Proposed changes in the leave rule*	Already intimated to the students.

Annexure A2

Action taken report (Part – II)

Minutes Sl. No of 54th meeting	Subject	Action taken
2015-54-Senate-09	Modalities for comprehensive examination and appointment of thesis examiners for Ph. D or M. Tech (Res.) programmes	Item was deferred
2015-54-Senate-10	Publication of results of 4th Semester M.Tech and 10th Semester Dual Degree students and approval of the list of graduating M.Tech. and Dual Degree B.Tech - M.Tech students	Implemented
2015-54-Senate-11	Assigning supervisors to the research students of Ex-Prof. Ramakar Jha, (CE)	Implemented
2015-54-Senate-12	Assigning supervisor to the research student of Ex-Prof. Arup Das, (AR)	Implemented. However, no fresh recommendation from DRC, AR has been received after joining of faculty.
2015-54-Senate-13	Recommendation of RPEC on new Enrolment, Provisional Registration and Registration of PhD and M. Tech(Res) students	Implemented
2015-54-Senate-14	Results of Ph.D. and M. Tech. (Res) Examinations	Implemented
2015-54-Senate-15	Reports on Student disciplinary cases:	
	a) *Case five expelled students in ragging case*	Implemented
	b) *Cinema Hall fighting case*	Implemented
	c) Case of theft of laptops	Implemented. However, Review report of ISDC is put up as an Agenda Item to this Senate for consideration
2015-54-Senate-16	Any other matter with permission of the Chair:	
	ITEM -1 : Admission of Foreign students under ICCR scheme for the session 2015-16	Implemented
	ITEM -2 : Proposal for change of Ph. D regulation on registration and earliest date of thesis submission.	Implemented
	ITEM -3 : Approval of results of Summer and Supplementary examinations 2015	Implemented

Lakshaman Rao Peri Centre for Advanced Analytics and Decision Sciences (LPCADS)
National Institute of Technology Rourkela
Specialization: Analytics and Decision Science(ADS)

FIRST SEMESTER

Sl. No	Sub. code	Subject	L-T- P	Credits
1	CS624	Database Engineering (Core – I)	3-0-0	3
2	CS625	**Data Mining and Warehousing** (Core – II)	3-0-0	3
3	MA655	**Mathematical Techniques for Data Analysis** Professional Elective – I	3-0-0	3
4	MA653	**Statistical Analysis** (Professional Elective – II)	3-0-0	3
5	SM617	**Marketing Science and Predictive Analysis** Professional Elective – III	3-0-0	3
6	CS771	Programming Laboratory using Python and R	0-0-3	2
7	CS773	Database and Data Mining Laboratory	0-0-3	2
8	MA673	Linear Algebra and Statistical Analysis Lab	0-0-3	2
9	CS789	Product Development laboratory	0-0-3	2
10	CS685	Seminar and Technical Writing – I	0-0-3	2
TOTAL				**25**

SECOND SEMESTER

Sl. No	Sub. code	Subject	L-T- P	Credits
1	CS708	**Machine Learning** (Core – III)	3-0-0	3
2	CS710	**Big Data Analysis** (Core – IV)	3-0-0	3
3	CS712 CS714	**Information Retrieval and Web Search /** **Recommender Systems** (Professional Elective – IV)	3-0-0	3
4	CS716	**Business Intelligence and Financial Analysis / Data Visualization** (Professional Elective – V)	3-0-0	3
5	CS718 CS720	**Social Network Analysis / Cloud Computing** Professional Elective – VI	3-0-0	3
6	CS 776	Machine Learning Laboratory	0-0-3	2
7	CS 774	Big Data Analysis Laboratory	0-0-3	2
8	CS 772	Information Retrieval / Recommender systems Laboratory	0-0-3	2
9	CS 690	Research Practice	0-0-0	2
10	CS686	Seminar and Technical Writing – II	0-0-3	2
TOTAL				**25**

THIRD SEMESTER

Sl. No	Sub. code	Subject	L-T- P	Credits
1	CS 691	Summer Research / Industrial Project	0-0-0	4
2	CS 693	Research Project – I	0-0-0	20
3	CS 687	Seminar & Technical Writing – III	0-0-3	2
TOTAL				**26**

FOURTH SEMESTER

Sl. No	Sub. code	Subject	L-T- P	Credits
1	CS 692	Comprehensive Viva-Voce	0-0-0	4
2	CS 694	Research Project – II	0-0-0	20
3	CS 688	Seminar & Technical Writing – IV	0-0-3	2
TOTAL				**26**

CS624 Database Engineering

ıurse Objectives:

- To provide students with basic concepts in databases both in terms of usage and implementation
- To make the students understand all requirement and operations that the analyst needed to analyze, design, and implement the systems
- To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementation

ɔurse Outcomes:

- Aware of various database systems and its design issues
- Design and implement a database for any specified domain according to well-known design principles that balance data retrieval performance with data consistency guarantees
- Formulate data retrieval queries in SQL and the abstract query languages

etailed Course

troduction to Database systems: Data Independence, Data Models, levels of abstraction, structure of DBMS, elational Model, Relational Languages, Query Languages: Relational Algebra, Relational Calculus, SQL, QUEL, QBE, tegrity constraints, Aggregate operators, Embedded and Dynamic SQL. Database design: E-R Model, Functional ependencies, decomposition, normalization, multivalued dependencies. File Organization: Storage, Buffer management, isk Management, File organization techniques, indexing. Query optimization: Query processing on various operations, anslating SQL queries, estimating the cost. Concurrency control and recovery: transaction, schedules, Lock based ɔncurrency, Lock management, Concurrency control without locking, Crash recovery- log, check pointing, media coveries. Advanced topics: Database Security, Distributed databases design, Object Oriented database design & its nplementation, Introduction to recent advances in database technology.

ssential Reading:

. Raghu Rama Krishnan and J. Gehrke, Database Management Systems, 3rd Edition, McGraw Hill,
. A. Silberschatz, H. F. Korth & A. Sudarshan, Database System Concepts, McGraw Hill, 5th ed, 2006.

upplementary Reading:

. J. D. Ullman, Principles of Data Base Systems, Galgotia, 2nd ed, 2003
. B. Desai, An Introduction to database system, Galgotia, 1997.
. C. J. Date: An Introduction to Data Base Systems, Addison Wesley, 1995.
. R. Elmasri, S. Navathe, S. B. Navathe, R. Sunderraman, Fundamentals of Database Systems, Addison Wesley, 2nd ed, 1994

CS625 Data Mining and Warehousing

ourse Objectives:

- To provide students with basic concepts in Data Mining and Data Warehousing
- To make the students understand the basic and state-of-the algorithms used for analyzing data obtained from different sources.
- To build a warehouse and demonstrate competence with the fundamental tasks involved with it.

ourse Outcomes:

- Aware of various critical operations involved in designing a data warehouse in many application domains.
- Implement well-known data mining techniques for obtaining interesting knowledge from data.
- Formulate new techniques for analyzing complex data.

etailed Course

ıtroduction to Data mining: Motivation for Data Mining, its importance, Role Data in Data Mining, Data Mining ınctionalities, patterns in data mining, Type of patterns, Classification of Data Mining Systems, Major issues in Data Mining; Data Warehousing and OLTP technology for Data Mining, Data Mining Languages, and System Architectures oncept Description: Characterization and Comparison, Mining Association Rules in Large Databases, Classification and rediction, Cluster Analysis, Mining Complex Data, Applications and Trends in Data Mining Characteristics of data

ehouse, Data Mart, Online Analytical Processing, OLAP tools, Data warehouse Architecture, Organizational Issuer, Is for Data warehousing, Performance consideration, case studies.

ential Reading:

Pang-Ning Tan, Vipin Kumar and Michael Steinbach, Introduction to data mining, Pearson, 2007.
Ian H. Witten and Eibe Frank, Data Mining: Practical Machine Learning Tools and Techniques, Elsevier, 2008.

plementary Reading:

G.K. Gupta, Introduction to Data Mining with Case Studies, Prentice-Hall of India, 2006.
J P. Adriaans & D. Zantinge, Data Mining, Addison Wesley, 1996.
Jiawei Han, Micheline Kamber and Jian Pei, Data Mining: Concepts and Techniques, Morgan Kaufmann, 2006.
Paulraj Ponniah, Data Warehousing Fundamentals: A Comprehensive Guide for IT Professionals, Wiley, 2001.

MA655 Mathematical Techniques for Data Analysis

urse Objectives:

- To provide students with basic concepts in Linear Algebra, Discrete Mathematics and Optimization techniques.
- To make the students understand the mathematical tools and techniques used for data analysis.

urse Outcomes:

- Aware of different mathematical techniques used for analyzing data.
- Implement well-known computational techniques using any programming language.
- Use different mathematical library functions for analyzing large data.

etailed Course

troduction to Vectors, Vector Space and Subspaces. Introduction to Matrices, Addition and Scalar Multiplication, latrix Vector Multiplication, Matrix Matrix Multiplication and its properties, Inverse and Transpose, Matrix actorization, Eigen Values and Eigen Vectors, Positive Definite Matrix, SVD.
ropositional logic, logical equivalence, predicates & quantifiers, and logical reasoning , Set and its basic operations, unctions: one-to-one, onto, inverse, composition, Relations: properties, Combining relations, Closures, Equivalence, artial ordering, Graphs and its basic properties.
inear Programming Constraints with less than equal to, equal to and greater than equal to types. Travelling Salesman roblem using branch and bound method, Integer programming, Non-linear programming problem solving using ibonnacci search method, Gradient search method.

ssential Reading:

1. Gilbert Strang, Introduction to Linear Algebra, Wellesley-Cambridge Press and SIAM , 4th Edition.
2. Kenneth Rosen. Discrete Mathematics and Its Applications, 7th Edition , McGraw Hill Publishing Co., 2012.
3. S. S. Rao, Optimization Theory and applications, Wiley Eastern Ltd. India, 1978, reprint 2005.

Supplementary Reading:

1. Gene H Golub, Charles F. Van Loan, Matrix Computation, Johns Hopkins University Press; 4th Edition
2. Lars Eld´en, Numerical linear algebra in data mining, Cambridge University Press, 2006.
3. J. P. Tremblay and R. Manohar, Discrete Mathematical Structures with Applications, to Computer Science, TataMc-Graw Hill, 2001

MA653 Statistical Analysis

Course Objectives:

- To provide students with basic concepts in statistics and probability.
- To make the students understand the statistical tools and techniques used for data analysis.

Course Outcomes:

- Aware of different statistical techniques used for analyzing data.
- Implement well-known computational techniques using any programming language.
- Use different statistical packages for analyzing data.

Detailed Course

Introduction to statistics, Probability and Popular Probability Distributions and Their Typical Applic- Binomial , Multinomial , Hypergeometric , Geometric , Pascal , Neg Binomial , Poisson , Normal , Gamma , Exponential , Beta , Uniform , Log-normal , Rayleigh , Cauchy , Chi-s Weibull , Extreme value , t distributions, Variability in estimates and the Central Limit Theorem, Confidence inte Hypothesis tests, Inference for estimators, Decision errors, significance, and confidence, Inference with the t-distrib Comparing two means, ANOVA, Introduction to linear regression.

Essential Reading:

1. Sheldon M. Ross, Introduction to Probability and Statistics for Engineers and Scientists, Academic Press; 4th E (2009)
2. Sheldon M. Ross, A First Course in Probability, Pearson Education Limited, 9th Edition.
3. Morris H DeGroot, Mark J Schervish, Probability and Statistics, Pearson; 4th Edition.

Supplementary Reading:

1. Gary Miner, Robert Nisbet, Handbook of Statistical Analysis and Data Mining Applications, Academic Press; F Edition (June 5, 2009)

SM617 Marketing Science and Predictive Analysis

CS771 Programming Laboratory using Python and R

rse Objectives:

- To provide students with basic concepts in programming.
- To make the students understand the different constructs of R and Python programming Languages .

ırse Outcomes:

- Aware of different statistical techniques used for analyzing data.
- Implement various computational techniques using R and Python language.
- Use of different library function of R and Python for analyzing data.

:ions

ativeailed Course

uarerview of R, R data types and objects, reading and writing data, Control structures, functions, scoping rules, dates and :rvalses, Loop, functions, debugging tools Simulation, code profiling.

utioroduction - Why we program in Python? Variables and Expressions, Conditional code, String, Files, Lists, Dictionaries, ɔles, Regular Expression.

ential Reading:

Roger D. Peng, R Programming for Data Science (E-book).

itio Charles R Severance, Python for Informatics: Exploring Information, CreateSpace Independent Publishing Platform; First Edition (September 2, 2013)

CS 773 Database and Data Mining Laboratory

urse Objectives:

- To provide students with basic concepts in programming.
- To make the students understand the different constructs of R and Python programming Languages .

'st

ıurse Outcomes:

- Aware of different statistical techniques used for analyzing data.
- Implement various computational techniques using R and Python language.
- Use of different library function of R and Python for analyzing data.

etailed Course

udy of SQL syntax; Study of Oracle syntax; Study of DB2 syntax; Writing Views, Assertions, Triggers; PL/SQL Programs ɔ be simulated given by instructor; Generating forms and reports; Following database to be designed and queries to be rocessed using SQL.; Oracle and DB2: Order processing; insurance; student enrolment; library; banking enterprise; rimary keys, data types and relevant queries for the above database will be supplied by the instructor; Front end may e created by using VB, Java.

nplement well-known algorithms in Data Mining using R, Explore Data Mining tools like WEKA, MATLAB. Mini roject on Data Analysis using data mining tools.

MA 673 Linear Algebra and Statistical Analysis Laboratory

:ourse Objectives:

- To provide students with basic concepts in programming.
- To make the students understand the different constructs of R and Python programming Languages .

:ourse Outcomes:

- Aware of different statistical techniques used for analyzing data.
- Implement various computational techniques using R and Python language.
- Use of different library function of R and Python for analyzing data.

Implement different Matrix operations using programming language R and Python. Use of in-built function MATLAB/R/Python for solving data analysis problems, i.e. Matrix Factorization, Eigen Values and Eigen Vectors, Pos Definite Matrix, SVD. Solve Linear Programming Problems using software packages.

CS708 Machine Learning

Course Objectives:

- To provide students with basic concepts in machine learning and its application in various domain.
- To make the students understand different techniques that a data scientist needs to know.
- To design and build a complete machine learning solution in many application domains.

Course Outcomes:

- Aware of various issues before applying a machine learning technique.
- Design and implement a set of well-known machine learning techniques used in analyzing data obtained from various domains.
- Formulate hybrid techniques for analyzing complex data.

Detailed Course

Introduction to Machine Learning, Supervised Learning, Unsupervised Learning, Linear Regression with One Varia Model Representation, Gradient Descent for Linear Regression, Linear Algebra Review, Linear Regression with Mult Variables: Gradient descent for multiple variables, Learning Rate, Normal Equations. Logistic regression, One-v classification, Logistic regression with Regularization, Neural Network Representation, Neural Network Learning, Prac advice for applying learning algorithms: How to develop, debugging, feature/model design, Support Vector Machi (SVMs). Unsupervised learning: clustering and dimensionality reduction. Anomaly detection. (Application of Mac Learning). Recommender systems. (Application of Machine Learning)

Essential Reading:

1. Tom Mitchell, Machine Learning, Tata-McGraw Hills.
2. Sergios Theodoridis, Pattern Recognition, Academic Press; 4th Edition (2008)
3. Richard O. Duda, Peter E. Hart, David G. Stork, Pattern Classification , Wiley-Interscience; 2nd Edition.

Supplementary Reading:

1. Christopher Bishop, Pattern Recognition and Machine Learning, Springer (2007)
2. Michael Bowles, Machine Learning in Python: Essential Techniques for Predictive Analysis, Wiley, 1st Edition (20

CS710 Big Data Analysis

Course Objectives:

- To provide students with concepts of basic analysis techniques in big data.
- To make the students understand different techniques that a data scientist needs to know for analyzing big data.
- To make student capable of handling big data in various domain.

Course Outcomes:

- Aware of various issues in big data analytic.
- Design and implement a set of well-known machine learning techniques used in analyzing big data.
- Aware of MapReduce Framework.

Detailed Course

What is big data, Introduction to analysis techniques for big data, MapReduce, Link Analysis – PageRank, Loc Sensitive Hashing -- Basics + Applications, Distance Measures, Nearest Neighbors, Frequent Itemsets, Data Stream Mi Analysis of Large Graphs, Computational Advertising, Large Scale Machine Learning, Support-Vector Machines ,Dec Trees, Advanced topic on big data : Topic-specific PageRank, Link Spam.

ential Reading:

Leskovec, Rajaraman, and Ullman , Mining of Massive Datasets, Cambridge Press.

Jimmy Lin and Chris Dyer, Data-Intensive Text Processing with MapReduce, Morgan & Claypool Publishers, 2010

ıplementary Reading:

Chuck Lam, Hadoop in Action, December, 2010 (E-Resource).

Jeffrey Dean and Sanjay Ghemawat, MapReduce: Simplified Data Processing on Large Clusters, OSDI'04: Sixth Symposium on Operating System Design and Implementation, San Francisco, CA, December, 2004.

Jeffrey Dean and Sanjay Ghemawat. (2010) MapReduce: A Flexible Data Processing Tool. Communications of the ACM, 53(1):72-77.

Fay Chang, Jeffrey Dean, Sanjay Ghemawat, Wilson C. Hsieh, Deborah A. Wallach, Michael Burrows, Tushar Chandra, Andrew Fikes, and Robert Gruber. (2006) Bigtable: A Distributed Storage System for Structured Data. Proceedings of 7th Symposium on Operating System Design and Implementation (OSDI 2006), pages 205-218.

CS712 Information Retrieval and Web Search

ırse Objectives:

- To provide students with basic concepts of Information Retrieval and its application in various domain.
- To make the students understand different techniques used in IR and Text Analysis.
- To design and build a complete IR system in many application domains.

ırse Outcomes:

- Aware of various design issues related to IR.
- Aware of working principle of Search Engine like Google.
- Design and implement a set of well-known IR techniques used in various domains.

tailed Course

als and history of IR; The nature of unstructured and semi-structured text; Inverted index and Boolean queries; Text coding: Tokenization, stemming, stop words, phrases, index optimization; Index compression: lexicon compression and stings lists compression; Gap encoding; gamma codes; Zipf's Law; Index construction: Postings size estimation, dynamic lexing, positional indexes, n-gram indexes; Retrieval Models: Boolean, vector space, TFIDF, Okapi, probabilistic, ıguage modeling, latent semantic indexing; Vector space scoring; Performance Evaluation; Text Categorization; Text ıstering; Web Information Retrieval: hypertext, web crawling, search engines, ranking, link analysis, PageRank, HITS; vanced Topics: Relevance Feedback, Query Expansion, Summarization, Topic detection and tracking, Personalization, ıestion answering, Cross language information retrieval.

ıential Reading:

Christopher D. Manning, Prabhakar Raghavan and Hinrich S , Introduction to Information Retrieval, Cambridge University Press. 2008

Ricardo Baeza-Yates and Berthier Ribeiro-Neto, Modern Information Retrieval, Addison Wesley,

pplementary Reading:

D.A. Grossman, O. Friede Information Retrieval: Algorithms and Heuristics , Springer, 2004.

I.H. Witten, A. Moffat, T.C. Bell, Managing Gigabytes ,Morgan Kaufmann, 1999

Text Information Retrieval Systems, C.T. Meadow, B.R. Boyce, D.H. Kraft, C.L. Barry Academic Press, 2007

Amy N. Langville, Carl D. Meyer, Google's PageRank and beyond: The science of Search Engine Rankings Princeton University Press, 2006

Course Objectives:

- To provide students with basic concepts and its application in various domain.
- To make the students understand different techniques that a data scientist needs to know for analyzing big data.
- To design and build a complete machine learning solution in many application domains.

Course Outcomes:

- Aware of various issues related to Personalization and Recommendations.
- Design and implement a set of well-known Recommender System approaches used in E-commerce and Tourism industry.
- Develop new Recommender Systems for a number of domains especially, Education, Health-care.

Detailed Course

Introduction to Recommender Systems, Eliciting Ratings and other Feedback Contributions, Implicit Ratings ,Lir Algebra notation: Matrix addition, multiplication, transposition, and inverses; covariance matrices, Taxonom Recommender Systems, Non-Personalized Recommenders Content-Based Recommenders, Collaborative Filtering- U User Collaborative Filtering, Evaluation ·Item Based Collaborative Filtering, Evaluation, Dimensionality Reduc Advanced Topics: Matrix Factorization, Diversity and Accuracy trade-off, Factorizing Machines.

Essential Reading:

1. Francesco Ricci , Lior Rokach , Bracha Shapira , Recommender Systems Handbook, Springer; 2011 edition
2. Dietmar Jannach, Markus Zanker, Alexander Felfernig and Recommender Systems: An Introduction, Cambr University Press; 1 edition (September 30, 2010)
3. M.D. Ekstrand, J.T. Riedl, J.A. Konstan, Collaborative filtering recommender systems, Found. Trends Human–Com Interact., 4 (2) (2011), pp. 81–173

Supplementary Reading:

1. X. Su, T.M. Khoshgoftaar, A survey of collaborative filtering techniques, Adv. Artif. Intell., 2009 (2009), p. 4:2
2. Y. Koren, Factorization meets the neighborhood: a multifaceted collaborative filtering model, in: Proceedings of 14th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, 2008, pp. 426–434.
3. A. Paterek, Improving regularized singular value decomposition for collaborative filtering, in: Proceeding of KDD Workshop at 13th ACM Int. Conf. on Knowledge Discovery and Data Mining, 2007, pp. 39–42.
4. G. Karypis, Evaluation of item-based top-N recommendation algorithms, in: Proceedings of the Tenth Internationa Conference on Information and Knowledge Management, 2001, pp. 247–254.

CS716 Data Visualization

Course Objectives:

- To provide students with basic concepts of Data Visualization and its application in various domain.
- To make the students understand different techniques that a data scientist needs to know for visualizing da

Course Outcomes:

- Aware of various issues related to data visualization.
- Design and implement a set of well-known approaches used in different domains.

Detailed Course

Introduction to data visualization, Terminology. Basic Charts and Plots, Multivariate Data Visualization. Principle Perception, Color, Design, and Evaluation. Text Data Visualization, Interactivity and Animation. Temporal Visualization, Geospatial Data Visualization, Visualization Case Studies, Redesign Principles and De Dimensionality, Hierarchical Data Visualization, Network Data Visualization.

Essential Reading:

Scott Murray , Interactive Data Visualization for the Web, O'Reilly Media, 2012.

ɔplementary Reading:
Edward Tufte, The Visual Display of Quantitative Information.

CS718 Social Network Analysis

ırse Objectives:

- To provide students with basic analysis techniques applied in social network.
- To make the students understand network concepts, including graph-theoretic fundamentals, state-of-the-art techniques in social network analysis.

ırse Outcomes:

- Aware of various concepts and theories of social network and social media analyses.
- Obtain knowledge of customer profiling, community and trend detection, targeting, sentiment analysis.

tailed Course

oɒes of Networks- nodes, edges, adjacency matrix, one and two-mode networks, node degree, Random network models: los-Renyi and Barabasi-Albert, Concepts: connected components, giant component, average shortest path, diameter, eadth-first search, preferential attachment, Network centrality, betweenness, closeness, eigenvector centrality (+ geRank), network centralization, Community: clustering, community structure, modularity, overlapping communities, ıall world network models, optimization, strategic network formation and search- small worlds, geographic networks, centralized search, Contagion, opinion formation, coordination and cooperation, Concepts: simple contagion, threshold ıdels, opinion formation, Cool and unusual applications of SNA Hidalgo et al. : Predicting economic development using ɔduct space networks (which countries produce which products), Learning about cooking from ingredient and flavor tworks, SNA and online social networks- how services such as Facebook, LinkedIn, Twitter, CouchSurfing, . are using SNA to understand their users and improve their functionality.

thsential Reading:
David Easley and Jon Kleinberg, Networks, Crowds, and Markets- Reasoning about a Highly Connected World, Cambridge University Press (2010).

CS720 Cloud Computing

ıurse Objectives:

- To provide students with basic concepts of different computing paradigm.
- To make the students understand different techniques used in Cloud computing.

ıurse Outcomes:

ɛtailed Course

verview of Computing Paradigm, Recent trends in Computing-Grid Computing, Cluster Computing, Distributed ɪmputing, Utility Computing, Cloud Computing, Evolution of cloud computing- Business driver for adopting cloud ımputing, Introduction to Cloud Computing , Cloud Computing (NIST Model), Introduction to Cloud Computing, History Cloud Computing, Cloud service providers, Properties, Characteristics & Disadvantages, Pros and Cons of Cloud mputing, Benefits of Cloud Computing, Cloud computing vs. Cluster computing vs. Grid computing, Role of Open andards- Cloud Computing Architecture , Cloud computing stack, Comparison with traditional computing architecture lient/server), Services provided at various levels, How Cloud Computing Works, Role of Networks in Cloud computing, otocols used, Role of Web services, Service Models (XaaS), Infrastructure as a Service(IaaS), Platform as a Service(PaaS), ftware as a Service(SaaS), Deployment Models -Public cloud, Private cloud, Hybrid cloud, Community cloud, frastructure as a Service(IaaS), Introduction to IaaS, IaaS definition, Introduction to virtualization, Different approaches

to virtualization, Hypervisors, Machine Image, Virtual Machine(VM), Resource Virtualization, Server Stor Virtual Machine(resource) provisioning and manageability, storage as a service, Data storage in cloud computing(stor as a service) Web 2.0, Web OS, Infrastructure Security, Network level security, Host level security, Application le security, Data security and Storage, Data privacy and security Issues, Jurisdictional issues raised by Data location, Iden & Access Management, Access Control, Trust, Reputation, Risk, Authentication in cloud computing, Client access in clc Cloud contracting Model, Commercial and business considerations

Essential Reading:

1. Barrie Sosinsky , Cloud Computing Bible, , Wiley-India, 2010
2. Buyya, James Broberg, Andrzej M. Goscinski , Cloud Computing: Principles and Paradigms, Rajkumar , Wile, 201.
3. Nikos Antonopoulos, Lee Gillam , Cloud Computing: Principles, Systems and Applications, Springer, 2012
4. Ronald L. Krutz, Russell Dean Vines , Cloud Security: A Comprehensive Guide to Secure Cloud Computing, , Wiley- India, 2010

Business Intelligence and Financial Analysis

Course Objectives:

- To articulate modern concepts, theories, and research in the field of Business Intelligence (BI).
- To articulate modern BI practices, including knowledge integration, sourcing and managing BI solutions.

Course Outcomes:

- Aware of different statistical techniques used for analyzing data.
- Implement well-known computational techniques using any programming language.
- Use different statistical packages for analyzing data.

Detailed Course

Understanding the BI process, Strategies of information gathering, The distinction between intelligence, informatior and data, Information asymmetry and competitive advantage, comparison with competitive intelligence, Comparisc with business analytics, Success factors of implementation, Business sponsorship, Semi-structured or unstructured data, BI Portals.

Essential Reading:

1. Larissa T. Moss and Shaku Atre, Business Intelligence Roadmap, the complete project lifecycle for decision suppc applications , Addison-Wesley Professional.
2. R. Sharda, D. Delen, & E. Turban; , Business Intelligence and Analytics. Systems for Decision Support, Pearson/Prentice Hall, 10th Edition.

CS776 Machine Learning Laboratory

Course Objectives:

- To provide students with basic concepts in programming.
- To make the students understand the different constructs of R and Python programming Languages .

Course Outcomes:

- Aware of different statistical techniques used for analyzing data.
- Implement various computational techniques using R and Python language.
- Use of different library function of R and Python for analyzing data.

Detailed Course

Overview of Machine Learning techniques, Introduction to Microsoft Azure Machine Learning Cloud Resource, Applic of Azure Machine Learning tools to existing datasets, Develop solution for real life problems using Azure Machine Learr toolkit, Exposure on other Machine Learning tool likes WEKA, MatLab.

CS774 Big Data Analysis Laboratory

urse Objectives:

- To provide students with knowledge of MapReduce Framework
- To make the students understand the different techniques used for analyzing big data.

urse Outcomes:

- Aware of different statistical techniques used for analyzing data.
- Implement various computational techniques using R and Python language.
- Use of different library function of R and Python for analyzing data.

tailed Course

erview of MapReduce Framework, Introduction to Hadoop. Utilization of Hadoop framework for various machine rning algorithm in big data, Learn to use Microsoft Azure Hadoop framework in Cloud, Mini Project on Big Data Analysis.

CS772 Information Retrieval Laboratory

urse Objectives:

- To provide students with basic concepts in programming.
- To make the students understand the different constructs of R and Python programming Languages .

urse Outcomes:

- Aware of different statistical techniques used for analyzing data.
- Implement various computational techniques using R and Python language.
- Use of different library function of R and Python for analyzing data.

tailed Course

estigate algorithms for stemming. Implement different aspects of retrieval, e.g. term frequency, document frequency d query satisfaction using a small document collection. PageRank and/or HITS algorithm to any directed graph, rsonalized or topic-directed crawling techniques, use of clustering in some application i.e., snippets clustering. periment with techniques for detecting duplicate documents.

CS780 Recommender Systems Laboratory

urse Objectives:

- To provide working principle of Recommender System.
- To make the students understand the different approaches used in the state-of-the –art Recommender System.

urse Outcomes:

- Aware of different perspectives of Recommender System.
- Implement well-know Recommender System using R.

tailed Course

erview of Recommender System techniques, Implement popular recommender system approaches like item based, er based collaborative filtering using different similarity measures. Implement Matrix Factorization approach using R Machine Learning toolkits (Azure Machine Learning). Mini Project on Recommender System.

Memorandum of Understanding
between
The University of North Carolina at Charlotte
and
National Institute of Technology, Rourkela

Agreement on cooperation on joint teaching and research program in the area of Analytics and Decision Sciences (ADS), between UNC Charlotte USA and NIT Rourkela. As a first tangible step we propose to develop a dual degree program in which NIT Rourkela students will earn the Graduate Certificate in Data Science and Business Analytics at UNC Charlotte as part of their Master's Degree in Technology (M. Tech.) at NIT Rourkela.

Article 1: Background and Overview

The University of North Carolina at Charlotte, also known as UNC Charlotte, UNCC, or Charlotte, is a public research university located in Charlotte, North Carolina, United States. UNC Charlotte offers 21 doctoral, 64 master's degrees, and 79 bachelor's degree programs through seven colleges: the College of Arts + Architecture, the College of Liberal Arts & Sciences, the Belk College of Business, the College of Computing and Informatics, the College of Education, the William States Lee College of Engineering, and the College of Health and Human Services.

UNC Charlotte's Data Science Initiative (DSI) program offers different programs in Data Science and Business Analytics (DSBA). As an interdisciplinary programs it sits at the intersection of business, computer and information sciences, statistics, and operations research. It is a unique blend of business acumen, data understanding, exposure to a diverse set of advanced analytics methods, and hands-on experience designed to help students apply learned knowledge on representative business problems. DSBA graduates are well equipped for employment in a wide variety of data intensive industries, such as financial services, energy, retail/supply chain, or healthcare, where the need for business analysts with quantitative, computational, and sophisticated analytical skills is growing at an explosive pace.

National Institute of Technology Rourkela, formerly Regional Engineering College Rourkela (REC Rourkela), is a publicly funded institute of higher learning for engineering and technology located in the steel city of Rourkela, Odisha, India. It is one of the 30 National Institutes of Technology in India and has been recognized as an Institute of National Importance by the National Institutes of Technology Act of Parliament, 2007.

The Computer Science and Engineering Department has been a pioneer in the country in creating researchers as well as practitioners in the area of Information and Communication Technology (ICT). Formed in 1986, the Department offers UG (B. Tech) Degree in Computer Science, M. Tech. degree in 3 specializations: in Computer Science, Software Engineering, and Information Security. The Department used to offer Master of Computer Application (MCA) program from 1986 till 2006. The Department also provides an outstanding research environment complemented by superior teaching. Graduates from the department are heavily recruited by both academia and industry. All over the world, alumni of the department occupy top positions in both academia and industry. The major areas of research include Software Engineering, Image Processing, Data Communication and Database Engineering.

NIT Rourkela intends to offer formal Master and Doctoral degree programs on Analytics and Decision Sciences (ADS), a desperate need of industry and business in India today. The course is proposed to be an interdisciplinary program hosted by the Department of Computer Science and Engineering in association

with the Department of Mathematics and School of Management. While the basic knowledge necessary to offer the program is available within the Institute, there is a paucity of practical experience both in professional practice and research. Co-operation with UNC Charlotte USA can substantially help the program in its early days by bootstrapping the process of expertise creation.

Article 2: Significance of Offering Courses on "Analytics and Decision Sciences (ADS)"

Decision science essentially refers to the application of Mathematics and Technology on large volume of data to extract insights for problems, which are not very clearly defined. Many business problems start off muddy. To help in solving them, one needs to understand and appreciate the business context. It requires an interdisciplinary approach consisting of several different skills based on business applications, applied Mathematics, Computer Science and Behavioral Sciences.

Data-driven decisions can be enabled by making a journey from data engineering to decision sciences. The terms of data engineering and decision sciences may be explained in the following fashion:

- Data engineering is the application of technology to help collect, store, process, transform and structure data to enable it to be used for decision support.
- Data science is the application of Mathematics and various aspects of Technology to solve business problems. This involves analysis, visualization and mathematical computations to extract insights in response to clearly defined business problems, using well identified data elements. Data science integrates and builds on data engineering by adding the discipline of Mathematics.

The most important advantages of application of data science are as follows:

- Data analysis helps in structuring the findings from different sources of data collected by making survey or research. It is further helpful in breaking a macro problem into micro parts. Data analysis acts like a filter when it comes to acquiring meaningful insight to the problem out of huge datasets.

While carrying out basic exploratory research, a researcher may generate huge quantities of data tangentially related of the research question. Data analysis is crucial element in processing the data and identifying significant and meaningful trends in the massive flow of information. One of the most important uses of data analysis is that it helps in keeping human bias away from research conclusion with the help of proper statistical treatment. With the help of data analysis, a researcher can filter both qualitative and quantitative data for problem identification and initiating its solution. Thus, it can be said that data analysis is of utmost importance for both the research and the researcher.

As we move towards an era where digitization of information is more and more on demand, the overall amount of data takes an exponential growth. Hence a research area on Big Data has emerged to precisely tackle the vast amounts of data generated, as well as to investigate the strong societal impacts incurred by the explosion of data in the society. The volume, variety and velocity of data coming into any organization continue to reach unprecedented levels. This phenomenal growth means that not only one must understand big data in order to decipher the information that truly counts, but one also must understand the possibilities of what one can do with big data analytics.

With big data analytics, data scientists and others can analyze huge volumes of data that conventional analytics and business intelligence solutions can't touch. High-performance analytics is necessary to process that much data in order to figure out what is important and what is not significant. Big data analytics uncovers hidden patterns, unknown correlations and other useful information that can be used to make better decisions. Hence the study on big data analytics has been emerged from the study of conventional data-analytics as a necessity to find solution to the growing variety of problems.

Using high-performance data mining, predictive analytics, text mining, forecasting, and optimization on big data enables the analyst to continuously drive innovation and make the best possible decisions. In addition, organizations are discovering that the unique properties of machine learning are ideally suited to addressing their fast-paced big data in new ways.

Eventually, every aspect of our lives will be affected by big data. However, there are some areas where big data is making a real difference today. Big data analytics has a good number of application areas. Some of them are:

- Understanding and Targeting Customers for Customer Relationship Management (CRM) / Marketing Management
- Understanding and Optimizing Business Processes
- Performance Optimization
- Improving Healthcare and Public Health
- Improving Sports Performance
- Improving Science and Research
- Optimizing Machine and Device Performance
- Improving Security and Law Enforcement
- Improving and Optimizing Cities and Countries
- Financial Trading

NIT Rourkela has decided to start such a course giving emphasis on research and teaching in the area of Analytics and Decision Sciences.

Article 3: Proposed Curriculum and Admissions Requirements

During the spring semester, starting in January 2016, NIT Rourkela students accepted by UNC Charlotte will travel to Charlotte to complete the Graduate Certificate in Data Science and Business Analytics. A proposed program of study for UNC Charlotte's Graduate Certificate and course descriptions can be found in Appendix A and B respectively. The full proposed curriculum for NIT Rourkela's Master's Degree in Technology can be found in Appendix C. The operational aspects of the program are as follows:

1. Students will apply to the M. Tech. in Analytics and Decision Sciences (ADS) at NIT Rourkela.
    a. The ADS program shall take students with mixed background (B. Tech, MBBS, M.Sc., M. A.), who will be selected on the basis of GATE Score and personal interview. Sponsored students from industry and business will be preferred. The distribution of seats and mode of selection shall be as per prevailing regulations of the institute.
    b. M. Tech. course on ADS will comprise of FOUR semesters (Two years).
        i. During the first semester, basic core courses will be covered at NIT Rourkela.
        ii. The second semester, selected students by both NIT Rourkela and UNC Charlotte will cover advanced level courses at UNC Charlotte, USA.
        iii. The third semester project work will be undertaken by the students at any industry working on the area of Data analytics in India or abroad.
        iv. Fourth semester thesis work will be carried out at NIT Rourkela.
2. NIT Rourkela students must submit a separate application to UNC Charlotte. In order to be accepted UNC Charlotte's Data Science and Business Analytics Graduate Certificate they must meet the requirements as established by the academic program (http://analytics.uncc.edu/graduate-certificate) and UNC Charlotte's Graduate School Admissions

(http://graduateschool.uncc.edu/future-students/admissions/application-requirements). Among the basic requirements:

a. a completed application by October 15th,
b. a GPA of 3.0 or above out of 4 and GPA 8.0 or above out of 10,
c. a statement of purpose outlining the goals for pursuing a graduate education,
d. complete set of unofficial transcripts, and
e. TOEFL or IELTS scores that meet the minimum standards as set by UNC Charlotte Graduate Admissions.

3. NIT Rourkela students will be required to pay tuition while attending classes at UNC Charlotte or while they are enrolled in courses taught by UNC Charlotte faculty.
4. A limited amount of funding may be available for a select group of NIT Rourkela students. UNC Charlotte will strive to arrange funds from its resources to support NIT Rourkela students through research and teaching assistantships.
5. Students involved in a dual program will be subject to the rules and policies of the university in which they are enrolled, and will be given the same rights and privileges of students of that university including but not limited to access to lectures, library and student services
6. NIT Rourkela students that participate in this program and successfully complete the requirements for each institution will earn dual degrees: a M. Tech. in Analytics and Decision Sciences (ADS) from NIT Rourkela and a Graduate Certificate in Data Science and Business Analytics (DSBA) from UNC Charlotte.
7. NIT Rourkela and UNC Charlotte will develop a mechanism to transfer credits acquired by the students of NIT Rourkela while carrying out the academic activities at UNC Charlotte to meet the accreditation and degree requirements for each constituent institution.
8. The students graduated from the master's program at NIT Rourkela will be encouraged to apply to the doctoral program at the UNC Charlotte.
9. The details of various subjects to be offered at NIT Rourkela and UNC Charlotte will be decided after final revisions of the MOU by both institutions.

Article 4: Program Development

UNC Charlotte agrees to share its accumulated expertise with faculty of NIT Rourkela and help in setting up M. Tech. discipline in Analytics and Decision Sciences (ADS) as well as Ph.D. in Analytics and Decision Sciences (ADS) and also in associated fields.

Article 5: Faculty Exchange

The faculties of UNC Charlotte and NIT Rourkela will visit the respective departments of the other institutions and will share the expertise with students of Masters and Ph. D. Programs of respective institutes for knowledge dissemination purpose.

Each institution is responsible for the costs for travel and accommodations for their faculty and staff.

Article 6: Establishment of Centre of Excellence

NITR will establish a Center of Excellence for Healthcare at NITR to help understand the disease patterns, demographic and lifestyle patterns of the citizens of the state of Orissa and in turn help detect the potential symptoms in advance. If done in collaboration with Government of Orissa, such center will help acquire the data from various sources and additional research grants from the local and state Governments. Such a

center will enable UNCC not only to have some of the UNCC professors and research staff to participate in the center but will help for joint teaching and research collaborations between NITR and UNCC.

Article 7: Intellectual Property

Intellectual Property generated by joint research will be shared by both institutions.

Article 8: Program Administration and Governance

NIT Rourkela will appoint a committee of professors to administer the M. Tech. program on ADS and research cooperation with UNC Charlotte. The committee will chaired by Dean (Academic) or a senior faculty member nominated by the Director. The committee will consist of the following members:

- Dean (Acad.) NIT Rourkela (ex officio): Chairperson
  or a senior professor of NIT Rourkela.
- Head, Department of Computer Science & Engineering (ex officio).
- Head, Department of Mathematics (ex officio).
- Head, School of Management (ex officio).
- The faculty members specializing in analytics.
- The faculty member of UNC Charlotte nominated by Dean, UNC CHARLOTTE.

All major decisions, academic or administrative, will be taken by Director, or by Chairman Coordination committee on his behalf, in consultation with the committee.

Article 9: Program Revision and Termination

1. This agreement shall become effective upon signature of all parties and shall expire 2 years after such date unless reviewed and renewed by mutual written agreement of the parties.
2. This Memorandum of Understanding can be terminated for any reason upon 6 months written notice, in which case all reasonable efforts shall be made to minimize disruption of work under the existing agreement.
3. This agreement is made in four copies and should be signed by an authorized representative from each university, each keeping two copies. Any disputes will be resolved by negotiations.

Signed by:

Prof. Sunil Kr Sarangi
Director, NIT Rourkela-769008, India

Date: 28 –Aug - 2015

Mirsad Hadzikadic, Ph.D.
Executive Director, Data Science Initiative
Professor, Department of Software and Information Systems
Director, Complex Systems Institute
College of Computing and Informatics
343-A Woodward Hall
UNC Charlotte
Charlotte, NC 28223

Date: 28 –Aug - 2015

Annexure – A5

IN THE HIGH COURT OF ORISSA: CUTTACK

(ORIGINAL JURISDICTION CASE)

W.P. (C) No. 13687 of 2015

(Code No: 019900

In the matter of:

An application under Article 226 and 227 of the Constitution of India;

And

In the matter of

An application for quashing of the order dated 14.7.2015 so far it relates to the petitioner, as the same is illegal and against the NIT guideline and regulation.

And

In the matter of

Sri Debasish Dhal, aged about 22 years, son of Sri Trilochan Dhal, C-64, Sector-19, Rourkela-8, Dist.-Sundargarh. ... **Petitioner**

-Versus-

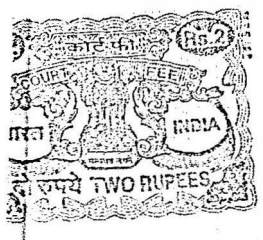
1. National Institute of Technology, Rourkela, Dist.-Sundargarh, *represented through it's Director.*
2. Director, National Institute of Technology, Rourkela, Dist.-Sundargarh.

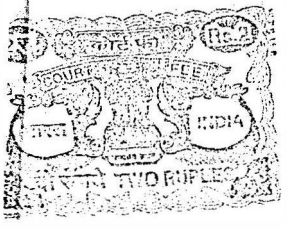
3. Registrar, National Institute of Technology, Rourkela, Dist.-Sundargarh.

4. Institute Standing Disciplinary Committee, represented through the Dy. Registrar (Academic) and its Member Secretary, National Institute of Technology, Rourkela, Dist.-Sundargarh.

5. Dy. Registrar (Academic) and its Member Secretary, Institute Standing Disciplinary Committee, National Institute of Technology, Rourkela, Dist.-Sundargarh.

... **Opposite parties**





[H. C.-98]

Sl. No. of Order	Date of Order	ORDER WITH SIGNATURE	Office note as to action (if any), taken on Order
07.	08.09.2015	Heard Mr.Sameer Kumar Das, learned counsel for the petitioner and Mr.S.P.Mishra, learned Sr. Advocate for Opposite Parties 1 and 2. It is submitted on behalf of the Opposite Party-Institution that the petitioner along with others have made representation to the Director of the Institute (Opposite Party No.2) and the Director in turn, has referred all the representations to the Senate for its consideration. It is submitted by Mr.Mishra, learned Sr. Advocate for Opposite Parties 1 and 2 that the Senate had taken decision for consideration of the representations but, since notice of the present writ application has been received by the Opposite Party-NIT, the Senate has deferred taking any decision thereon awaiting further orders of this Court. We are of the considered view that there was no direction of this Court injuncting the Senate from taking any decision on the representations of the petitioner and others. However, since it is stated that the representations of the petitioner and others are pending consideration by the Senate, we direct that the Senate may consider the representations forthwith preferably, within a period of ten days from today. Such decision shall be intimated to the Court by the Opposite Parties through an affidavit immediately thereafter. In the interregnum, we also direct the petitioner to make a representation to the Director (O.P.2) to be permitted to attend classes pending decision by the Senate. After	

[O. H. C.-98]

Sl. No. of Order	Date of Order	ORDER WITH SIGNATURE	Office note as to action (if any), taken on Order

such a representation is made, it shall be open for the Director to consider the same in accordance with law.

List this matter on 25th September, 2015.

Free copy of this order be handed over to the learned counsel for the Opposite Parties in course of the day. Urgent certified copy of this order be granted on proper application.

Sd/- I. Mahanty, J.

Sd/- Dr. D. P. Choudhury, J.

Ranjan.

-32- Comp. by Bikram

Date of Application 10.9.
Date of Notification : 10.9.
Date of Supply : 10.9.
Date of Ready : 10.9.
Date of Delivery :

15

C.A. No. — 66045/15

MEMO OF COSTS

	Rs.	P.
Application Fee.....	5	50
Searching Fee.....		
Extra Fee for Urgency	3	00
Folios 4 Pages.....	15	00
Hologram Fees (4).....	4	00
Other Items if any.....	2	50
Total	29	10

(Rupees Twenty Five & Paise Ten only)

10.9.15
ASST.

EXAMINER OF COPIES
10/9/15
SUPERINTENDENT
COPYING DEPARTMENT

CERTIFIED TO BE A TRUE COPY
10.9.2015
Assistant Registrar (Estt.)
ORISSA HIGH COURT
Authorised Under Section-76, Act-I of 1872

राष्ट्रीय प्रौद्योगिकी संस्थान, राउरकेला
National Institute of Technology, Rourkela

Minutes of the ISDC meeting held on 11.09.2015

Sub. : Review of the Laptop/Bicycle theft case.

In response to the appeals by the students concerned, Director advised to ISDC to review the Laptop/Bicycle theft case and to submit its recommendation to the Senate for consideration.

Accordingly, an ISDC meeting was held at 3.00 p.m on 11.09.2015. Following members were present.

1. Prof. K. C. Pati (Dean SW)	Chairman
2. Prof. R. K. Patel (Chief Warden)	Member
3. Prof. H. B. Sahu	Member
4. Prof. U. C. Pati	Member
5. Ms Maninder Kaur, Roll-214CS2133	Student Member
6. Sri Dibyashakti Panda, Roll-414ER2021	Student Member
7. Deputy Registrar (Academic)	Member Secretary

The Committee went through the representations submitted by the students, took a fresh look at its earlier findings/recommendations to the Senate and the final decision by the Senate.

On thorough re-examination, the committee remains convinced all the six students have been involved in theft of laptops and/or bicycles and that the cases detected are not isolated events. Some of them are also in collusion with outside persons involved in inter-district trafficking. Considering the seriousness of the offences, expulsion from the Institute is not inappropriate. However, in the absence of stronger evidence, severity and irreversible nature of total expulsion, the committee feels that the students may be given some benefit of doubt and punishment imposed may be commuted to a good extent.

It is past experience of the ISDC that in many cases students remain united to protect each other and real facts are difficult to establish. In such a situation, ISDC has no choice but to recommend a common penalty for a whole group with some deviation when appropriate. Once penalty is imposed, the unity breaks the each individual student reveals his information. This normally helps in establishing the truth. In the instant case, some of that has happened and a clear picture has now emerged.

The following is recommended in the above background:

1. Though Sri Rinku Raj and Sri Rakesh Biswal were involved in the theft of laptop and helped their seniors in bicycle theft, they had returned the laptop in first instance and outrightly admitted their misdeeds before the committee from the very beginning. It is these two students who revealed some clues towards the involvement of other students in the theft of laptop and bicycles thereby helping the committee. In the opinion of the Committee their case should be considered sympathetically in order to give the message to the student community that co-operation with ISDC in eradicating an offence shall be rewarded.

2. Sri Debasish Dhal has not yet admitted his involvement in the theft cases. But basing on th statements of the key witnesses (Sri Deepak Panigrahi, a close friend and associate of him and Rinl Raj) the committee is convinced that he is involved in the theft of bicycles and selling them outsiders. In the fresh representation, both Rinku Raj and Rakesh Biswal have mentioned that bo Debashis Dhal and Deepak Panigrahi accompanied them to Sector-2 Bus stand in the bike of Debash Dhal. When use of bike is forbidden for the boarders, knowing it well, Sri Debashis Dhal used to use h bike in the campus. The same has been admitted by him verbally before his uncle, Dean (SW) and th Director in the Office Chamber of the Director.

3. In the earlier recommendation of the Committee the financial penalty recommended to be impose to the students was only on the basis of cost of laptops and the committee missed to consider th financial dishonesty due to theft of bicycle which needs to be considered.

In view of the above, the Committee submits following recommendations for consideration of the Senate:

1.	Rinku Raj, (113FT0518) Rakesh Biswal (413MA5057) Debasish Dhal (112BT0019)	Expulsion from the Institute for one semester (Autumn 2015-16
2.	Deepak Panigrahi (112CR0501) K.Anil Kumar Rathod (112CE0452) Madhu Sudan Sethy (112CE0060)	Expulsion from the Institute for one year (Academic year 2015-16

In addition, the following supplementary penalties may be added for all six students:

i) P-17: Placement facility withdrawn totally (Cancellation of offers to final year student if alread given).

ii) P-6: Debarment from Medals & prizes linked to academic performance, and prizes (e.g. Sports Blue Best Sports person of a year) based on cumulative performance.

iii) P-3: Debarment from elected offices and captaincy of sports teams.

iv) A financial penalty of Rs.50,000/- each may also be imposed on above six students, th collection being spent on student welfare.

4. There shall be no adverse entry in the conduct certificate of the student.

5. If in future their fresh involvement in such activity is established, the original penalty of tot expulsion from Institute will be implemented.

6. All the above students and their parents need to give undertaking to the effect that he (his ward) w not be involved in any such activity in future. If any such involvement will be established against hi (his ward), the original penalty of total expulsion from Institute will be implemented.

Submitted for kind consideration of Senate.

11.9.15

Prof. R. K. Patel
(Member)

11.9.15

Prof. U. C. Pati, EC
(Member)

11.9.15

Prof. H. B. Sahu, MN
(Member)

11/9/15

Ms Maninder Kaur
(Member)

D. Panda. 11.09.15.

Sri Dibyashakti Panda
(Member)

11/9/15

Mr. B. Acharya
(Member-Secretary)

11.9.15

Prof. K. C. Pati
(Chairman, ISDC)

To: The Director

I agree. Pl put up to Senate for final decision.

2015/09/14

Registrar

- 100 - 35 -

ıbra registrar@nitrkl.ac.in

ɜnate – Inclusion of Agenda – Plagiarism – Reg.

From : Mukesh K. Gupta <guptam@nitrkl.ac.in> Sun, 13 Sep, 2015 13:16
bject : Senate – Inclusion of Agenda – Plagiarism – Reg.
To : director@nitrkl.ac.in
Cc : banshidhar majhi <bmajhi@nitrkl.ac.in>, REGISTRAR REGISTRAR-NIT,RKL <registrar@nitrkl.ac.in>

o,
he Director & Chairman, Senate
IT Rourkela

ear Sir,
reetings! I came to know that there will be a Senate meeting omorrow (14.09.2015). With due respect, may I request to kindly include an agenda on the "Allegation of Plagiarism" on the PhD thesis of Shri. Bibhukalyan Prasad Nayak. As I had informed earlier to you and the Dean Academic (Letter no: NITR/BM/HOD/2015/M/990 dt: 27.08.2015 and NITR/BM/HOD/2015/M/1007 dt: 31.08.2015), this is a serious allegation which is baseless, false and without scientific merit. I am deeply hurt.

Sincerely,

Mukesh

Copy to:
- Dean Academic
- Registrar and Secretary, Senate

= = = = = =

Mukesh K. Gupta
Associate Professor and Head,
Department of Biotechnology and Medical Engineering,
National Institute of Technology, Rourkela,
Odisha 769008, India.
Tel: +91-661-2462294 / +91-7873482264.
E-mail: guptam@nitrkl.ac.in

NATIONAL INSTITUTE OF TECHNOLOGY, ROURKELA
DEPARTMENT OF BIOTECHNOLOGY & MEDICAL ENGINEERING

o.: NITR/BM/HOD/2015/M/1007 Dated: 31.08.2015

can (Academic)
Through HOD, BM)

has come to my notice that a news was published in a national Newspaper (Indian xpress, Dated: 28.08.2015; copy enclosed as Annexure-I) wherein, it was stated that The Doctoral Scrutiny Committee (DSC), the Dean (Academic) and the Director had ound indications of plagiarism in case of (a PhD) research scholar". I am not sure if it ferred to the thesis of Shri. BP Nayak (Roll No: 509BM403) wherein one of the DSC ember had questioned the methodology used in Chapter 5 of the revised thesis and had lleged that two images (Figures 40 and 41) were plagiarized images. If it is so, I would ike to bring following into your kind notice:

To the best of my knowledge, the Doctoral Scrutiny Committee (DSC) or the Dean (Academic) had not alleged plagiarism in the revised thesis of Shri. BP Nayak (Roll No: 509BM403). It was only one particular DSC member who had made the allegation of plagiarism. As a Supervisor, I had tried to respond to the allegation but the past DSC Chairperson did not consider my opinion and disallowed me from explaining by saying that the Supervisor is not a member of the DSC and, I should be speaking only when specifically asked by the Institute. The same was recorded by me in the minutes of the DSC meeting (Dated: 10 September 2014), which can be obtained from the past DSC Chairperson for verification. Other members of the DSC will also vouch for the same.

In the DSC meeting held on 10 September 2014 (Please see the minutes of the meeting available with the past DSC Chairperson) and in an explanation letter sent to you (Letter dated: 08 October 2014), as a Supervisor, I had explained that the used methodology is a proven methodology and the images (Figures 40 and 41) are GenMAPP software generated output of simulation work using the student's own data. The images (Figures 40 and 41) are software generated output wherein biomarkers identified in the PhD work of Shri. BP Nayak were mapped on KEGG pathway database, as was indicated in the Methods and Materials section of the Chapter 5. Since KEGG pathway database has datasets from several published sources, on a casual look, Figures 40 and 41 in the thesis might look similar to those in many published papers. However, the data in Figures 40 and 41 are different and, are the results of our computational analysis using the GenMAPP software. The PhD thesis of Shri. BP Nayak did not claim discovering a new pathway. Instead, it has mapped the identified biomarkers of the present study on known signalling pathways in an attempt to find possible drug targets for alleviating fatigue. This is a standard methodology.

You may also please see the enclosed excerpts from manual of the GenMAPP software (copy enclosed as Annexure-IIa, IIb and IIc) that, the

P.T.O.

complete GenMAPP pathway archives are available for viewing at www.wikipathways.org which stores the pathway contents in formats compatible with analytical tools such as PathVisio, Cytoscape etc. The concerned DSC member who alleged plagiarism had actually downloaded the pathway from the GenMAPP archives in www.wikipathways.org and had claimed plagiarism. Clearly, the concerned DSC member alleging plagiarism is either ignorant or misinterpreted or has attempted to mislead the DSC, the Dean and the Director.

To substantiate the above facts, I am again enclosing the published literatures (Annexure IIIa-c) and the excerpts from the manual of GenMAPP software (Annexure IIa-c) which will clearly establish that, contrary to the comments sent by past-DSC Chairperson to the Academic Section,

i. Computational method used in the Chapter 5 of the revised thesis of Shri. BP Nayak is a well proven methodology.
ii. GenMAPP software can be used as visualization tool for depicting molecular pathways using gene as well as protein data.
iii. Images of molecular pathways (Figures 40 and 41) generated by using GenMAPP software can be used for scientific publication and thesis writing and **CANNOT** be considered a plagiarised image from internet.

One may clearly see that the external examiners (both Indian and Foreign) have not questioned the validity of the methodology and the simulation data, obviously because the allegations were not genuine. However, I am dismayed to see that such a false allegation made by a particular DSC member is still being given weight without considering the scientific opinion of the Supervisor. This is particularly disheartening because the concerned DSC member, who had made such allegations, has no expertise in the research area under question. I contend that the allegation of plagiarism made by the particular DSC member is incorrect.

Mukesh K. Gupta
(Supervisor)

HOD, BM

Encls:

1. Annexure I (Copy of the news in Indian Express Newspaper)
2. Annexure IIa-c (Excerpts of from the manual of GenMAPP software and associated literatures supporting the above claims)
3. Annexure IIIa-c (Sample copies of published literatures in reputed journals showing the use of protein data for GenMAPP software and use of software generated images of pathways for publication)

Copy to:

- The Director
- The Registrar

THE NEW INDIAN EXPRESS

Chairperson-Director Tug of War Suffocates NIT-R

Annexure - I

ROURKELA:The National Institute of Technology here (NIT-R) seems to have delved into a crisis of sorts with the honorary Chairperson of the Board of Governors allegedly not letting the Institute run as per the provisions of the National Institutes of Technology, Science Education and Research (NITSER) Act, 2007. The clash of ego between the Chairperson and the Director has left the institute gasping for many reasons.

As a result, the day-to-day administration is reported to have taken a complete beating because of the alleged highhandedness of the Chairperson, Vasantha Ramaswamy. Though the Human Resources Development Ministry is upset over the recent developments because of non-adherence to the provisions, it seems helpless to sort out the jam.

As per the document available with this paper, a probationary employee was dismissed from job in January, 2015 after three committees found him guilty of 'lack of financial integrity' and the Board approved the dismissal. Three months later, at the reported instance of the Chairperson, the Board passed a resolution to restore him, but the Ministry set aside the resolution. The employee has moved the court.

In another instance, the Ministry in a letter in August, has written a dissent note to the Chairperson for inviting two former members of the BoG, Dr RK Bhandari and Prof Rintu Banerjee, whose tenure had lapsed on March 24, 2014, to the Board meeting. The two former members are allegedly supporting the Chairperson in granting PhD to a research scholar whose case is in dispute.

The Doctoral Scrutiny Committee (DSC), the Dean (Academic) and the Director had found indications of plagiarism in case of the research scholar. As the matter was being sorted out as per the norms, Registrar SK Upadhyay reportedly persuaded the Senate, the apex academic body, to take a decision which is not in conformity with facts.

NIT-R Director Prof SK Sarangi said, "The normal process is very kind to the student but there can be no compromise on academic standard."

Replying on behalf of the Chairperson, Upadhyay dismissed the allegations saying Ramaswamy was trying to clarify some contentious legal issues as per the guidelines. He said the two former members were invited to the Board meeting as special invitees as they were earlier allowed to attend such meetings.

On the PhD student's case, he said Ramaswamy received a complaint of 'academic harassment' and under provisions of the NITSER Act, the BoG has power to review the acts of the Senate.

On removal of the probationary employee, Upadhyay said, the case is pending in the court and the Board will take a decision as per direction of the court. The Chairperson is not insisting on restoring him, but following the guidelines.

Annexure – A7

राष्ट्रीयप्रौद्योगिकीसंस्थान, राउरकेला

National Institute of Technology
Rourkela – 769 008

Director's Office

No. NITR/DR/M/2015/322
Date: 14th September, 2015

Sub: Supplementary agenda item for today's Senate meeting.

The following MOUs have been worked out with reputed universities and organisations abroad.

1} AIESECs (An International organisation of students)Kolkata office.

2} New Your University School of Medicine, New York City

3} School of Oral and Dental Science, University of Bristol, Bristol, UK

As per the recent circular of the Govt. all MOUs with overseas organisations need approval of BOG. The BOG desires that all MOU proposals are to be considered by the Senate before being presented to BOG with its recommendation.

The senate is requested to consider these proposals.

Sunil Kr. Sarangi

Encl: as above

To

Registrar (with a request to kindly include these supplementary items in the agenda of today's senate meeting. Paper copies to be circulated as early as possible. Electronic copies are also to be circulated well in advance.)

DRAFT

AIESEC

The international platform for young people to explore and develop their leadership pote

Memorandum of Understanding
AIESEC in Kolkata
&
National Institute of Technology, Rourkela

AIESEC is a completely youth-managed, voluntary, not-for-profit international organization which is present in over 128 countries, across more than 1700 universities all over the world.

NIT Rourkela with about three hundred faculty members and six thousand students is a leading institute of higher learning in India. Declared as an Institute of National Importance by the NIT Act of the Parliament 2007,it offers undergraduate, postgraduate and doctoral programs in Engineering, Science, Humanities, Management and Social Science.

I. The purpose of this MOU is to memorialize certain objectives, principal terms, and other preliminary understandings that have been reached between AIESEC and NIT Rourkela, to confirm their present intent to work together in the manner described herein below, subject to the broad terms and conditions set forth in this MOU.

II. The focal point of contact in AIESEC will be Mr. Kaushal Dhanuka, Vice President, Local Committee Development, AIESEC Kolkata.

III. The focal point of contact in NIT Rourkela shall be the Dean (Student Welfare) or a faculty or student nominated by Director on his recommendation. To start with, Director's nominee will be Shri Masihullah ALimy, a citizen of Afghanistan and a student of B.Tech (Civil Engineering) of NIT Rourkela.

Henceforth, Masihullah Alimy would be referred to as the "Expansion Entity President" for AIESEC in NIT Rourkela.

AIESEC holds a rotating membership body; hence the point of contacts would respectively change.

III. National Institute of Technology and AIESEC in Kolkata believe that mutual collaboration will enhance and serve in the interest of both parties thus helping them in achieving a common goal of providing the students of NIT Rourkela, a national/international platform to explore and develop their leadership potential to have a positive impact on the society.

IV. In view of this belief, AIESEC in Kolkata wishes to offer the following services:
o1. AIESEC can provide the students and staff/faculty of National Institute of Technology, Rourkela who are below the age of 32:

✓ Opportunities to avail AIESEC's DEVELOPMENTAL international internship programs (Global Citizen Program), through which it can offer a very enlightening international working environment in various projects, schools or NGO's across the world. This can be an instrumental learning for the students.

AIESEC Kolkata

DRAFT

AIESEC

The international platform for young people to explore and develop their leadership potentia

Opportunities to avail **AIESEC's CORPORATE international internship programs (Global Talent ·ogram),** through which it can offer a very challenging **international working environment in a corporate mpany.** This can be an instrumental learning for the students.

A platform to **build a global network** which coupled with AIESEC's leadership opportunities and ·tional/international conferences/seminars helps develop future global leaders and entrepreneurs.

AIESEC is present in over **1600 universities spanning more than a 128 countries.** By associating with :SEC in Kolkata, National Institute of Technology, Rourkela **will have a platform to position itself** nong these top Universities around the world and build healthy associations with them through :SEC's Global Internship Program.

AIESEC assures that the financial policy of the AIESEC International Internship Program, will be made ·xtremely transparent to students, and proper communication will be channelized.

ıe financial policy of AIESECC Kolkata (applicable for the entity) will be validated, and all financial :cisions will be enforced with reference to the financial policy.

ıe financial transactions will happen via the AIESEC Kolkata bank account, and no personal account will : utilized for the same, unless in case of extreme urgency

:. However, AIESEC will not hold any liability to National Institute of Technology, Rourkela with regards to ıe Internship Program, and the point of communication for each student of National Institute of :chnology, Rourkela will directly be with an AIESEC Kolkata representative ONLY. There will be one-one ımmunication between the 2 parties, to avoid any discrepancies.

/II. National Institute of Technology, Rourkela will co-operate to the extent possible, for the **various ·ocuments instrumental to their VISA application process,** for your students willing to go for an AIESEC nternship abroad.

VIII. AIESEC will provide career guidance to the students and information on the availability of internships. will also mentor students and help steer them into their paths of interest.

.. **In return for these services, National Institute of Technology, Rourkela agrees to provide AIESEC's ıolkata chapter (AIESEC-Kolkata), the following features:**

:. National Institute of Technology, Rourkela fully welcomes AIESEC-Kolkata to operate in their campus vith the following support:

Permission to promote **all AIESEC activities** in all relevant departments of the university and hold ·eminars and events on various issues that can be fruitful to students or the staff/faculty members of NIT ɔurkela.

AIESEC Kolkata

DRAFT

✓ Helping AIESEC with recommendation letter from NIT Rourkela, stating the nature and objective of the AIESEC's Global Internship Program.

3. NIT Rourkela shall support AIESEC -Kolkata's activities by providing the logistical and office support whenever needed. These might include for example: (all without charge)

✓ Access to a multi-media projector and related conference/meeting facilities.

✓ Use of photocopy/printing machines to prepare materials for promotion of AIESEC events, or to prepare handouts for AIESEC's International Training Programs.

✓ Computer printouts of promotion materials like posters, hand-outs, flyers or placards.

✓ Stationery like white paper, markers, brown paper, blank CDs, etc for AIESEC's various events and activities.

X. The following procedure shall be adopted by AIESEC Kolkata to be in constant communication with National Institute of Technology, Rourkela , to gauge and monitor the partnership:

➢ End of the month meeting with National Institute of Technology, Rourkela representative /coordinator

➢ One quarterly meeting with Director

➢ Regular sharing of information, evaluation and surveys with National Institute of Technology, Rourkela.

r The above agreement is subject to binding, based on approval of the Board of either party.

We agree to the above articles.

Date: 12-08-2015

Prof. Sunil Kr. Sarangi
Director,
National Institute of Technology,
Rourkela

Kaushal Dhanuka
Vice President – Expansions
AIESEC Kolkata

Prof. K. C. Pati 12.8.15
Dean (Student Welfare),
National Institute of Technology,
Rourkela

Masihullah ALimy
Entity Expansion President
AIESEC NIT Rourkela

AIESEC Kolkata

MEMORANDUM OF UNDERSTANDING (MOU) between

New York University School of Medicine, New York City

&

National Institute of Technology, Rourkela

This is an agreement between New York University School of Medicine, hereinafter called "Party A" and National Institute of Technology Rourkela, hereinafter called "Party B" for mutual cooperation in research, teaching and application to health care.

I. PURPOSE & SCOPE

The purpose of this MOU is to clearly identify the roles and responsibilities of each party as they relate to biomedical research in conjunction with Ispat General Hospital, Rourkela, for which separate MOUs are already in place.

In particular, this MOU is intended to:

- Enhance mutually beneficial and bilateral collaborative research between researchers from National Institute of Technology, Rourkela and New York University School of Medicine, New York City, in the field of Health Biotechnology, Biomedical Engineering and related areas.
- Increase interaction between scientists of both institutions to leverage their different expertise and allow novel approaches to research questions that are common to both teams and Institutes;
- Promote relationship among scholars, students and faculties of both the parties in the relevant field of research.

II. RESPONSIBILITIES OF *PARTY A* UNDER THIS MOU

- To design and develop research proposals in collaboration with Party B.
- To identify appropriate funding sources for the submission of these grant/fellowship proposals (these can include the NIH, the Welcome Trust - DBT Alliance, specific calls for proposals from private foundations in the US, DBT India, etc.);
- To ensure a fair distribution of the respective responsibilities and budgetary assignments. Upon agreement of these parameters by both parties, oversee the timely submission of these proposals to the aforementioned funding sources;
- To undertake the co-supervision of the project in collaboration with Party B, once the funds are secured and awarded. Party A will be responsible for the supervision of the research at NYU School of Medicine, as well as at Ispat General Hospital and will liaise with Party B on a regular basis through email, phone calls and meetings while in India throughout the project(s);
- To support the bilateral collaboration by identifying and approaching potential partners beneficial to the further development of the research platform supported by the present MOU;
- To provide Party B the expertise in cell biology and pathology when needed;
- To promote faculty and student exchange programs between both parties, the expenses to be borne by the deputing institutions.
- To participate in the training program at NIT by delivering guest lectures (when requested and deemed appropriate) and by organizing training workshops in collaboration with Party B;

- To permit mutually agreed scientists of NYU School of medicine to serve as adjunct faculty at NIT Rourkela and to participate in teaching and guiding research on mutually agreed terms.
- To promote bilateral collaboration by acknowledging the present MOU during oral presentations (conferences, posters, etc.) but also, when possible, through institutions' webpages and scholar articles;
- To review the terms of the present MOU on an annual basis with Party B, and revise them if judged necessary by both parties.

III. RESPONSIBILITIES OF *PARTY B* UNDER THIS MOU

- To design and develop research proposals in collaboration with Party A and his team;
- To identify appropriate funding sources for the submission of these grant/fellowship proposals (these can include the NIH, the Welcome Trust DBT Alliance, specific calls for proposals from private foundations in the US, DBT India, etc.);
- To ensure a fair distribution of the respective responsibilities and budgetary assignments. Upon agreement of these parameters by both parties, oversee the timely submission of these proposals to the aforementioned funding sources;
- To undertake the co-supervision of the project in collaboration with Party A, once the funds are secured and awarded. Party B will be responsible for the supervision of the research at NIT and will liaise with Party A on a regular basis through email, phone calls and meetings throughout the project(s);
- To permit research fellows and scientific staff employed by Party A or by its collaborators in India (e.g. Ispat General Hospital) in joint R&D projects to enroll in Ph.D, M.Tech (Res) and other degree programs of NITR subject to satisfying academic requirements of NITR. On all such matters decision of Director NITR shall be binding on both parties.
- To support the bilateral collaboration by identifying and approaching potential partners *beneficial to further development of the research platform supported by the present MOU;*
- To provide the Party A the expertise in scaffolding and cell culture technology when needed.
- To provide faculties and students exchange programs between both parties, the expenses to be borne by the deputing institutions.
- To promote the bilateral collaboration by acknowledging the present MOU during oral presentations (conferences, posters, etc.);
- To review the terms of the present MOU on an annual basis with Party B, and revise them if judged necessary by both parties.

IV. IT IS MUTUALLY UNDERSTOOD AND AGREED BY AND BETWEEN THE PARTIES THAT:

- Any modification of the present MOU needs to be mutually agreed upon to become effective.
- The present MOU can be terminated at any point of time by any of the two parties.

V. EFFECTIVE DATE AND SIGNATURE

This MOU shall be effective upon the signature of both parties. It shall be in force from the date of signature for a period of five years unless extended by mutual agreement.

Both parties indicate agreement with this MOU by their signatures.

VI. SIGNATURES AND DATES

New York University School of Medicine

Date: / /

National Institute of Technology, Rourkela

Date: / /

MEMORANDUM OF UNDERSTANDING

Between

National Institute of Technology, Rourkela
As an activity under the
***Centre of Excellence on Orthopaedic Tissue Engineering and Rehabilitation [CoE (OTER)]* created under TEQIP-II**

And
School of Oral and Dental Science,

UNIVERSITY OF BRISTOL, BRISTOL, UK

The National Institute of Technology, Rourkela (herein after called NITR), in support of its programme under CoE (OTER), operating in the Department of Biotechnology and Medical Engineering, and School of Oral and Dental Science, University of Bristol, UK, aim to establish a strong relationship between the two universities to accelerate research work. Both the universities believe that the relationship will offer mutual benefits through joint research and development, sharing of knowledge, technology transfer, joint organization of workshops/conference etc. Therefore University of Bristol and National Institute of Technology, Rourkela agree to enter into this Memorandum of Understanding.

I. Principles of Cooperation:

The National Institute of Technology, Rourkela, India and University of Bristol, UK agree to develop their relationships under the principle of mutual understanding and mutually complimentary activities, yielding benefits to both the universities.

II. Areas of Cooperation:

Both Universities will participate in scientific research, technical or professional activities of mutual interest. The terms of any mutual assistance shall be discussed and agreed upon in writing by both parties prior to the initiation of any particular programme of activities.

The following short and long term objectives will be achieved through the cooperation-

1. To promote relationship among research scholars, students and faculty both the Institutions
2. To promote links in teaching and research activities
3. To promote and develop exchange of students and faculty between University of Bristol and NIT Rourkela
4. To promote joint research, organizing seminars, conferences, workshops, refresher courses and other related activities and to assist each other in obtaining funding from outside sources when need arises
5. To encourage other activities based on mutual agreement and benefit

III. Implementation

To implement the spirit of the agreement as outlined above, it is understood and agreed that-

i. The terms of any mutual assistance under this MOU shall be discussed and agreed upon in writing by NITR (represented by Coordinator and Principal Investigator of CoE(OTER) and School of Oral and Dental Science, University of Bristol, UK prior to the initiation of any particular programme of activities.

ii. Proposals of any sort of collaborative activity under this MOU will be submitted through the Coordinator and Principal Investigator CoE(OTER)-NITR and School of Oral and Dental Science, University of Bristol, UK. It is also agreed that reports on any activity of mutual interest or of mutual involvement shall be shared by both Universities without violating any explicit confidentiality clause or intellectual property right.

iii. The travel and living costs of student interns may be provided by CoE(OTER)-NITR or School of Oral and Dental Science, University of Bristol, UK depending on mutually agreed terms in each case.

iv. Financial requirement for collaborative R & D work, technology transfer, organising seminars/workshops/conferences/training and other related activities will be negotiated separately and will be subject to the availability of funds.

V. Tenure of the Agreement:

i. The agreement shall be effective upon signing by both parties and shall remain in effect for a period of Five years.

ii. The MOU may be amended at any time as indicated by written consent both parties.

iii. As long as one party does not give six months' notice terminating this agreement, it shall automatically be renewed.

Prof. Sunil Kr. Sarangi
Director, National Institute of Technology, Rourkela
India

Prof. N A J LIEVEN
UNIVERSITY OF BRISTOL, BRISTOL
United Kingdom

Witness-

Prof. Krishna Pramanik,
Coordinator, Principal Investigator,
CoE-OTER, TEQIP-II, NIT Rourkela

Prof. Bo Su
Professor, School of Oral and Dental Science
University of Bristol, UK

राष्ट्रीय प्रौद्योगिकी संस्थान, राउरकेला
NATIONAL INSTITUTE OF TECHNOLOGY, ROURKELA

विभाग/Department/कार्यालय/Office: Training & Placement Centre

संo/No. : NITRKL/TP/2015/M/816 दिनांक/Date 14.9.2015

विषय/Subject: Training & Placement Leave.

Students are permitted for placement leave upto 6/8 days per semester. This is fine for normal students, but there are few students we call them Placement Coordinator (PC), who are working for placement activities in addition to their own placement. PC's activities includes communicating with companies, maintaining placement schedule, receiving company representatives at the railway station, visiting places outside Rourkela along with the shortlisted candidates of a Company to represent T&P, assisting company representatives during online test & interview etc. Therefore placement leave upto 6/8 days is quite insufficient for PCs.

So, I would like to request you to kindly enhance the T&P Leave for PCs as proposed:

Students representatives	Placement Leave proposed
Placement Coordinators (16 nos.)	09 leave for 3 credits 12 leave for 4 credits 03 leave for 2 credits
Placement Coordinators (Core Group-5 nos.)	12 leave for 3 credits 16 leave for 4 credits 03 leave for 2 credits

This is for your kind approval.

14/9/15

Prof S.K.Jena
Professor In-charge
Training & Placement

(1) Inclusive of the basic concession of 2x credits for Theory or 2 labs. given to all final year students.

(2) Overall constraint on total absence to be honoured.

I agree in principle & recommend to Senate. Pl put up to Senate today.