INDIAN INSTITUTE OF TECHNOLOGY (INDIAN SCHOOL OF MINES), DHANBAD

MINUTES OF THE 11TH MEETING OF THE BOARD OF GOVERNORS HELD ON 04 SEPTEMBER, 2019 AT IIT(ISM), DHANBAD

Members present:

Prof. D D Misra, Chairman, BOG, IIT(ISM), Dhanbad	: Chairman
Prof. Rajiv Shekhar, Director, IIT(ISM), Dhanabd	: Member
Prof. Pallab Banerji, IIT Kharagpur	: Member
Prof. Gopal Pathak, Vice Chancellor, Jharkhand Technical University	: Member
Shri Gautam N Mehra, CMD, Savita Oil Technologies Ltd	: Member
Prof. N R Mandre, IIT(ISM), Dhanbad	: Member
Prof. Rima Chatterjee, IIT(ISM), Dhanbad	: Member
Prof. J K Pattanayak, Deputy Director, IIT(ISM), Dhanbad	: Special invitee
Dr. Pramod Mathur, Registrar (Addl. Charge)	: Secretary

Prof. Shailendra Singh, Director, IIM Ranchi attended meeting through Skype.

Leave of absence was noted forAdditional Secretary (TE), MHRD, New Delhi.

At the outset, the Chairman welcomed all the members of BOG.

The agenda items considered in the meeting and decisions taken thereon are as under:

11/1 Confirmation of the Minutes of the 10th Meeting of the BOG of IIT(ISM) held on 21.06.2019

Minutes of the 10th meeting of the BOG held on 21 June, 2019 were confirmed.

11/2 Action taken on the decisions of the 10th Meeting of the BOG held on 21.06.2019

Actions taken on the decisions taken in the 10th meeting of the BOG held on 21 June, 2019 were noted.

11/3 To review the Status Report of various ongoing construction works undertaken by CPWD at IIT(ISM)

Status of progress of work in six ongoing construction works undertaken by CPWD was presented before the Board by Shri Pradeep Kumar, Project Manager, IIT(ISM) Project, CPWD, Dhanbad. He also presented the status of other projects in pipeline. The BOG advised the Project Manager, CPWD to maintain the target and project completion dates as specified earlier and to complete these projects within the sanctioned amount.

11/4 Director's report on progress of various activities

The Director, IIT(ISM), Dhanbad presented a report on the progress made by the Institute on various areas since the last meeting of the BOG.

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11/5 Presentation by department of MS, ECE and ESE (Vision, Mission, Road Map and major achievements during last 2 years)

Presentations on Vision, Mission, Roadmap and major achievements during the last 2 years by the three Departments, viz. Management Studies, Electronics Engineering and Environmental Science & Engineering were made by Prof. Saumya Singh, Prof. Jitendra Kumar and Prof. S K Gupta, Heads of the respective Departments which were followed by appropriate deliberations. Copies of their presentation are attached at Annexure-I.

11/6 Reporting and Ratification Items

The BOG noted the reporting items and ratified the decisions taken and approvals accorded by the Chairman, BOG, IIT(ISM), Dhanbad as mentioned from Sl. No. 1 to 18 mentioned in the agenda.

11/7 To receive and ratify the recommendations made by the Finance Committee scheduled on 04September 2019 at 11:00 A.M.

Recommendations made by the Finance Committee in its meeting held on 04 September, 2019 were received and approved by the BOG.

11/8 To Consider conferment of the Degree on graduating students

BOG approved conferment of the Degrees on graduating students as placed at agenda item no. 11/8 of the BOG agenda, page no. 89 to 174.

11/9 Renaming of Department of Fuel & Mineral Engineering to Department of Fuel, Minerals and Metallurgical Engineering and change of B.Tech Programme from B.Tech in Mineral Engineering to B.Tech in Minerals and Metallurgical Engineering

The BOG approved the proposal of renaming of Department of Fuel & Mineral Engineering to Department of Fuel, Minerals and Metallurgical Engineering and change of B.Tech Programme from B.Tech in Mineral Engineering to B.Tech in Minerals and Metallurgical Engineering. The Board also recommended to make amendments in the Statutes of IIT (ISM), Dhanbad for change in the departments name.

11/10 Proposal to establish Centre for Earth, Energy and Environment Research (CEEER)

The proposal was considered by the BOG and approved for establishment of the Centre for Earth, Energy and Environment Research (CEEER). The Board also recommended to include the Centre's name in the Statutes of IIT (ISM), Dhanbad.

11/11 Proposal for establishment of "Naresh Vashisht Centre for Tinkering & Innovation" at IIT (ISM), Dhanbad

The proposal was considered by the BOG and approved for establishment of "Naresh Vashisht Centre for Tinkering & Innovation" at IIT (ISM), Dhanbad. The

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Board also recommended to include the Centre's name in the Statutes of IIT (ISM), Dhanbad.

While thanking Mr. Naresh Vashisht for his generosity towards his alma mater the BOG also recorded a commendation for the efforts made by Prof. Rajiv Shekhar, Director, IIT(ISM), Dhanbad and Prof. Dheeraj Kumar, Dean (International Relations & Alumni Affairs) and his team in this regard.

11/12 CONFIDENTIAL

11/13 Recommendation of the Committee constituted to examine the grievance of Shri A K Paswan, Computer Operator vis-a-vis Shri Gunadhar Das, Ex-Data entry Operator

CONFIDENTIAL

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11/14 Capping of student strength in the existing campus

The Board noted that the institute is in very dire straits in terms of availability of land and the students are accommodated with great difficulty within the limited space. The proposal for transfer of additional land is under consideration of Government of Jharkhand. The existing accommodation for student and faculty/ staff is not sufficient to meet current requirement.

After deliberation the Board decided that till allotment of additional land and construction of additional facilities at the additional land (new campus), the maximum student strength be limited to 7500. This will also include escalation of student strength due to implementation of EWS reservation till 2020-21.

11/15 (i) AOB:

To institute "Institute Researcher of the Year (Publication and Project) Award" for Faculty Members on the basis of their annual publications in preceding calendar year and on the basis of project that has advanced best practices, technology, data or tools to the benefit of scientific community

The BOG approved the proposal to initiate the award for Faculty Members on the basis of their annual publications in preceding calendar year and on the basis of project that has advanced best practices, technology, data or tools to the benefit of scientific community. The award/prize money will be credited to the PDF of the faculty to be used for R&D and professional development.

The Board advised that a separate award, for Teaching Excellence may also be instituted and suitable methodology for evaluation of nominations for the same may be devised.

The meeting ended with a vote of thanks to the Chair.

Encl: Annexure-I (Copy of presentation)

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[Pramod Mathur]
Registrar (Addl. Charge)
& Secretary, BoG

ANNEXURE-I

9/13/2019

DEPARTMENT OF MANAGEMENT STUDIES
IIT(ISM), DHANBAD

VISION
Emerging Areas

MBA in Business Analytics	MBA in Financial Services & Markets	MBA in Energy Management
Marketing Analytics	Financial Services	Energy Mix
Financial Analytics	Financial Markets	Energy Security
Operations Analytics	Financial Technologies	Energy Efficiency
HR Analytics	Computational Finance	Energy Pricing

STRENGTH

Marketing:
- Digital Marketing
- Channel Management
- Social Psychology of Consumer Behaviour

Finance:
- Corporate Governance and Financial Performance
- Sustainability Reporting
- Financial Markets

Operations Management:
- Productivity and Human Factor Engineering
- Supply Chain Management
- Remanufacturing and Reverse Logistics

Human Resource Management:
- Industrial Psychology
- Industrial Relations
- Personnel Management

WEAKNESSES

- Artificial intelligence and machine learning application for business decision making process.
- Big data analytics application for various industry domains.
- Energy Management and formulation of Public Policy for the energy sector.
- Future energy demand and supply forecasting and energy pricing.
- Sustainable Practices in Energy Management.

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OPPORTUNITIES AND THREATS

OPPORTUNITIES

- Demand for Data Science and Big Data Analytics across various industry domains
- Application of AI and Machine Learning in manufacturing and service industry
- Demand for experts in the area of Financial Services & Markets
- Greater focus in sustainable energy management across various industry domains
- Huge scope for interdisciplinary collaborative research

THREATS

- Continuous change in industry trends
- Rapid changes in government policies for energy sector

ROADMAP

- Data Analytics in Business Decision Making
- AI and Machine Learning in Manufacturing and Service Industry
- Big Data Analytics in Business Processes
- Financial Services, Technologies & Markets
- Energy Management and Policy
- Data Analytics in Energy Pricing
- Sustainable Energy Management

1. MBA in Business Analytics in collaboration with
   - Department of Maths and Computing,
   - Computer Science & Engineering &
   - IBM (Emerging Technologies Lab)

2. MBA in Financial Services & Markets in collaboration with
   - NISM (National Institute of Securities Markets)
   - Department of Maths and Computing
   - Computer Science & Engineering

Thank you

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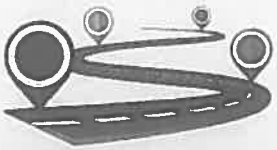
VISION AND ROADMAP



ELECTRONICS ENGINEERING DEPARTMENT
IIT(ISM), DHANBAD

VISION

Emerging Areas

- THz and mm wave technology
  - Antenna Technology & Microwave Devices
  - Microwave Photonics
  - Massive MIMO communication
  - RF Integrated Circuits
  - Applications in mm wave 5G communication, and beyond, Terahertz vision
- Smart systems and Communication Networks
  - Sensors: RF, Optical, CMOS & nanomaterial based sensors
  - Use of IoT for various applications in Mining, Petroleum Industries, Smart vehicles

EXISTING STRENGTH

Communication and Signal Processing:

- Signal Processing algorithms for wireless communication for 4G and 5G communication
- Intelligent Signal Processing for Cognitive radio
- Resource Allocation for Next Generation Networks (Electronic & Optical networks
- Speech enhancement

Optoelectronics and Optical Communication:

- Modeling and simulation in the areas of
  - Microwave photonics, Silicon photonics
  - Nanophotonics
  - Photonic Integrated Circuits
  - Novel materials including graphene
- Facility for growth of Solar PV Cells and other opto-electronic Devices using PVD (RF & DC sputtering, Thermal and E-beam evaporation); Thin film characterization [under CERE]

VLSI Design:

- Simulation on novel materials for development of next generation on-chip interconnects, FETs and ultra-sensitive sensors
- Memristor based circuit design
- Design of Nano-scaled MOS Devices and circuits
- Smart embedded microsensors (MEMS, MOEMS etc.)

RF and Microwaves:

- MIMO based Antenna, Surface Integrated Waveguide (SIW) based Antenna
- Metamaterial for RF & Microwave Engg
- Anechoic chamber facility

WEAKNESSES

Communication & Signal Processing

- Hardware based real time experiments for wireless communication
- Computer vision & Image processing
- Expertise in optimization theory for wireless communication networks
- Quantum Communication

Photonics:

- Fabrication & characterization facilities for photonic devices

VLSI Design:

- Expertise in circuit design
- Design of on-chip circuits
- Basic characterization facilities

RF and Microwave:

- RF and Microwave Active Circuits
- RF Sensors

Brahma
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OPPORTUNITIES

- Huge Opportunities for data communication systems
- Emerging technology areas such as 5G, IoT/ Sensors, Drones
- Increasing need of Industrial Automation
- Advance electronic components for satellite & space communication
- Electronic systems for the development of smart cities
- Self driven vehicles
- Smart Embedded Micro Sensors for Biomedical Environmental and Agricultural Application
- Smart system and modern communication network design for safety in underground and open cast mines
- Electronic Technologies for defense applications
- Structural Health monitoring system using optical sensors

THREATS

- Lack of semiconductor processing industries in India
- Lack of interest of domestic electronic industry on technological innovativeness

ROADMAP

RF and Microwave

- Antenna Design, Optimization, fabrication and testing
- Converter less MIMO array system
- RFIC: Low noise amplifiers, filters, couplers, mixers (Design, fabrication, testing)
- Design & development of electrically/artificial magnetic conductor at mm wave

Photonics:

- Microwave Photonics: Experimental facilities for generation & measurement of mm wave & mm wave signals
- Design & development of Photonic sensors (strain, temperature, chemicals, gases) with applications in Underground Mines
- Devices & components for Photonic Integrated Circuits (Design, fabrication and characterization)

VLSI Design:

- CMOS based sensors
- Analog and Digital IC design using memristors
- Flexible electronics (Simulation, design and fabrication of wearable sensors
- Emerging Nano-scaled MOS Devices and circuits for sensors

Communication and signal processing

- Development of signal processing algorithms for mm wave massive MIMO systems & IoT
- Development of IoT based Network layer protocols for 5G communication networks

Achievements

- Development of Static Optical Traffic Weigh Bridge (funded by DST-SERB)
- Development of High sensitivity Graphene oxide coated fiber Bragg grating (FBG) based sensor for chemical detection (funded by DAE-BRNS)
- Design and development of Photonic beam steering technique for Broad band satellite communication link (Photonic feeding of antenna array) for ISRO
- Development of Perception Informed by Navigation for Search and Rescue for DRDO

Prof. R.K. Choudhary received IE(I)Young Engineers Award 2019 20

- Mr T Sreenath Reddy (PhD Scholar) received Young Scientist Award from URSI in 2019
- Mr Sravanth Mangal (B Tech ECE) topped the GATE 2019 (Rank 1)

- Design of Four-Port MIMO Cognitive Radio System for Mid-Band 5G Applications using the single port (with filtenna concept)
- Design of node architecture for Elastic Optical Networks (funded by DST-SERB)
- Developed a flexible metamaterial absorber (Featured interview in IET Electronics Letters, U.K.)
- Development of signal processing algorithms to improve the reliability of a novel 5G modulation scheme known as "Filter Bank Multi Carrier Offset Quadrature Amplitude Modulation (FBMC-OQAM)

Thank you

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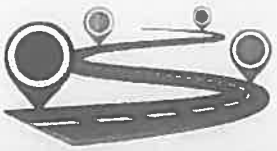
VISION AND ROADMAP



DEPARTMENT OF ENVIRONMENTAL SCIENCE & ENGINEERING
IIT(ISM), DHANBAD

VISION

Emerging Areas

- Clean Air Program & Climate Change
  - Aerosols Characterization for Black Carbon & Climate Sensitivity
  - Development of Gaseous Pollutant Control System
  - Indoor Air Quality for Human Health
  - Transportation Planning and Management System to Promote Active Transport and Smart Vehicles
- Emerging Technologies for Water Reuse
  - Advanced Electro Chemical System
  - Nano Technology for Emerging Contaminants
  - Development of Sensors
  - Development of High Rate Bioreactor for Water Reclamation
- Waste Management Technologies
  - Recession of Mining Degraded Land
  - Waste To Energy
  - E & Plastic Waste Management

EXISTING STRENGTH

Air Pollution & Control
- Air Quality Assessment & Emission Inventory
- Air Pollution Modeling
- Vehicular Emission Control & Modeling

Water Pollution & Control
- Nano-technology for Water and Wastewater Application
- Electro-chemical Techniques for Emerging and priority pollutants
- Modeling and Simulation of High Rate Bio-reactor
- Contaminant Transport Modeling

Solid Waste Management
- Utilization of Waste as a Resource
- Application of RS & GIS in Solid Waste Management
- Microbial Composting

Mining Environment
- Augmentation of Mine Water for Potable Use
- Ecological Restoration of Mine Degraded Lands
- EIA/EMP & Mine Legislation
- Mine Closure

Environmental Biotechnology
- Algal Bio-fuel Production
- Microbial Remediation of Emerging Pollutants
- Gene Expression Studies
- Phyto-remediation

WEAKNESS

Air Pollution & Control
- Air Pollution Control System
- LIDAR for Upper Atmosphere Studies
- Climate Observatory System

Water Pollution & Control
- Simulation & Scale up to Modular Plant
- Technology Transfer
- Software – Application & Validation

Applied Environment
- Environmental Economics
- Socio-economics

Solid & Hazardous Waste Management
- Plastic Waste Management
- E-waste Management
- Hazardous Waste Management

Environmental Biotechnology
- Whole Genome Sequencing
- Recombinant DNA Technology and Cell Culture Facilities.
- Metagenomics Studies

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OPPORTUNITIES

- Centre of excellence of MOEF&CC
- Key resource centre of Ministry of DDWS
- Industry-Institute interaction
- Scope for interdisciplinary collaborative research
- Alumni base
- Scope of field based experiment in mining area

THREATS

- Competition with unorganized environmental sector/agencies
- Changes in Environmental policies

ROADMAP

Air Pollution & Climate Change
- National Clean Air Program (NIP & BACT)
- Indoor Air and Clean Transport
- Development of Desulphurization (FGD) Techniques in Indian Scenario

Water and Wastewater Management
- Low Cost Treatment Technology for Emerging Contaminants
- Looping System to Resolve Future Water Scarcity
- Water Apps for Conservation of Water Resource
- High Rate Rain Water Harvesting System
- Community Potable Water Purification Systems

Waste Management
- Fly Ash based alternative material
- Reconstruction of Mine Land and Ecological Restoration
- Plastic Waste Management (PWM) - Impacts and Revenue Recovery
- Application of Artificial Intelligence for Predictive Modeling

Environmental Biotechnology
- Sustainable Biosynthesis of Bio-fuel Precursors
- Development of Bio-sensors

ACHIEVEMENTS IN LAST TWO YEARS

LIST OF ONGOING R&D PROJECTS

Funded by Government of India

Sl. No.	Project No	Title of the Project	Coordinator(s)	Total cost of the project (Rs. in lakhs)	Funding Agency
1	2018 19	Potential & Validation of Sustainable Natural and Advance Technologies for Water reuse in India	S. K. Gupta Alok Sinha	126 32	Indo-EU
2	DST(FIST) / [1425/2016-2017/ 471/ ESE	To Augment the Post-graduate Teaching and Research Facilities in the Department of Environmental Science & Engineering, Indian School of Mines, Dhanbad	HOD/ESE S. Jagadevan C. Banerjee	144 00	DST (FIST)
3	IMP/2019/ 000286	Solar Driven Community Potable Water Purification System	Saravanan P (PI) Thangavel R (CO-PI) Gopinath P, NTK (CO-PI) Subhankar Basu, NSFT Ranchi(Co-PI)	118 516	DST (SERB)
4	DST(SERB)/1173 1/2017 2018/ 528/ ESE	Design and Development of Full Solar Spectrum Enriched Photocatalyst for Sustainable Water Treatment	Saravanan Pichiah	15 40	DST (SERB)

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LIST OF ONGOING R&D PROJECTS

Funded by Government of India

Sl. No.	Project No.	Title of the Project	Coordinator(s)	Total cost of the project (Rs. in lakhs)	Funding Agency
5	MOWS/2015-16/453/ESE	Control of Disinfection By-products Formation in Drinking Water Supplies of India	S. K. Gupta Alok Sinha B K Mishra	25 20	MOWS
6	DST/Inspire Faculty Award/2014/LS PA-23/ ESE	Molecular Characterisation & identification of Hydrogen producing Algal species & their Biotechnological Potential	C. Banerjee	68 00	DST (SERB)
7	MoEF(1) 2015-16/443/ ESE	Remediation of Ground Water Contaminated with Hexavalent Chromium in Sukhina Valley, Odisha, using Nano Zero Valent Iron (nZVI) Technology	Alok Sinha S K Gupta B K Mishra	24 83	MOEF&CC

LIST OF ONGOING R&D PROJECTS

Funded by Government of India

Sl. No.	Project No.	Title of the Project	Coordinator(s)	Total cost of the project (Rs. in lakhs)	Funding Agency
8	ICMR/2016-2017/478/ ESE	ALGAL Biomass Harvesting Through Biopolymeric Approach	C Banerjee S. Jagadevan	14 946	ICMR
9	CIL (R)/ 2017 2018/ 539/ CHEMICAL ENGG	High ash coal gasification and associated upstream and downstream process (Coal to Chemicals, CTC) (Inter-departmental project)	1. M. Mishra (Chemical Engg.) Alok Sinha B. K. Mishra	100 00	CIL

LIST OF ONGOING R&D PROJECTS

Funded by Industrial Organizations

Sl. No.	Project No.	Title of the Project	Coordinator(s)	Total cost of the project (Rs. in lakhs)	Funding Agency
1	SAIL/2018-19/617/ESE	Monitoring of air quality and analysis of water samples and noise monitoring at different points of Washery & Chemplts	B K Mishra S Pandian E.	16 99	SAIL
2	SAIL/2018-19/621/ESE	Monitoring of air, water and noise at different locations of Coal Washery of SAIL at Jitpur	Suresh Pandian E B K Mishra	4 06	SAIL
3	SECL/2018-2019/592/ ESE	Scientific Study into various aspects regarding dumping of Fly Ash in the external and internal dumps of Dipka Expansion Project of M/s South Eastern Coalfields Limited (a running mine)	B Paul	28 91	SECL
4	ICFRE/2018-19/605/ESE	Development of approach and methodology for environmental performance rating index (EPRI) for coal mines of Coal India Ltd With reference to air quality	M K Jain	11 83	ICFRE Dehradun

LIST OF ONGOING R&D PROJECTS

Funded by Industrial Organizations

Sl. No.	Project No	Title of the Project	Coordinator(s)	Total cost of the project (Rs. in lakhs)	Funding Agency
5	Tata Steel/ 2017 2018/ 535/ ESE	Study to Develop & Improve Nitrification in AIS (Advent Integral System) at BOT Plant	S K Gupta Alok Sinha B K Mishra	23 60	TATA STEEL
6	Rungta(1)/18-19/623/ESE	Scientific study on impact of mining in hydrological behavior of aquifer in BONAI and KOIRA sector of Sundargarh District of Odisha	B Paul	11 83	Rungta & Sons Ltd
7	VEDANTA/ 2018-2019/ 598/ESE	Study on Health, Safety and Environment	Vipin Kumar	8 85	Vedanta Ltd

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Patents

Title	Area	Date of Publication	Patent Holders
A process for the preparation of bio-coagulant using *Moringa oleifera* seed defatted cake for the removal of fine particles from coal washery effluent	Coal Washery Effluent Treatment	04 05 2018	S R Samadder, Gaurav V Kapse
Novel System For Regenerating and Reusing nZVI/ZVI Particles in Wastewater Treatment	Industrial Wastewater Treatment	2018 (Applied)	Alok Sinha Amal Krishna Saha

Thank you

13/9/19