IIT(BHU): Retrospective & Prospectivus

Rajeev Sangal
Director
Indian Institute of Technology
(Banaras Hindu University) Varanasi, India
(director@iitbhu.ac.in)

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Faculty Address
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Overall Outline

Four lectures:

Part I: Academics & Research

Part II: Faculty & Students Affairs

Part III: Administration, Environment, & Harmony

Part IV: Prospective Us

Part I

Academics & Research

Outline

Birth of IIT(BHU)

Conversion of BHU-IT to IIT(BHU)

BHU-IT changed into IIT(BHU) on 29 June 2012. People:

Core Team

- Prof Pankaj Chandra, alumnus & then-Director, IIM Banglr
- Prof KP Singh, then-Director, BHU-IT
- Prof AK Ghose, Metallurgy Engg
- Prof AK Tripathi, Computer Sc & Engg
- Prof NK Mukhopadhyay, Metallurgy Engg
- Prof AK Mukherjee, Chemistry
- Prof SK Sharma, Mining Engg
- Dr SP Mathur, Dy Registrar

Alumni Association – Active People

- Mr Vish Narayanan, IBGAA
- Mr Debashish, AIBA
- Mr Rajeev Gupta, AIBA

...Conversion of BHU-IT to IIT(BHU)

Earlier efforts

- Prof BN Roy, then-Director, BHU-IT
- Prof SN Upadhyaya, then-Director, BHU-IT
- Prof Dhananjai Pandey, Material Sc & Tech

IIT(BHU) Office Staff

- Mr Debendu Mukherjee
- Mr Tarun Pandey
- Mr Bachche Lal

Conversion Successful

BHU-IT got converted into IIT(BHU) on 29th June 2012 by an act of parliament

- I joined here as Director on 16th April 2013

UG Curriculum 2014

Dean (Academic Affairs)

- Prof Surendra Kumar (2012-14)
- Prof GVS Sastry (2014-17)
  - Assoc. Dean: Prof ASK Sinha (2015-17)
- Prof ASK Sinha (2017-)

UG Curriculum Review Committee (UGCRC) - 29 Aug 2013

- Prof Devendra Kumar, Ceramic Engg – *Chairman*
- Prof AK Mukherjee, Chemistry
- Prof AK Ghose, Metallurgical Engg
- Prof Santosh Kumar, Mechanical Engg
- Dr Chandan Upadhyay, SMST
- Prof RK Srivastava, Electrical Engg
- Prof NC Karmakar, Mining Engg
- Prof PK Mukherjee, Electronics
- Dr Senthil Raja A, Pharmaceutics
- Dr AK Verma, Chemical Engg
- Prof Kamalakar Karlapalem, Dean (Acad), IIIT-Hyderabad

Desired Qualities in Graduating Engineer

A Analytical ability (Analyzing situations, applying knowledge)

B Building ability (Creativity, working with hands)

C Caring and character (Sensitivity, courage to act on one's beliefs)

Desired Objectives

1. Develop engineers with **research orientation and innovation attitude**
   - Ability to deal with unstructured situations and real contexts
2. **Do research or build things** within 4 years of undergraduation
   - Not only after graduating, but while being here
3. Also **breadth of knowledge:** From science to engineering to humanities

Research/Innovation Orientation

- Provide research/innovation experience to the student
  - Many courses with projects and term papers.

* This equips student to deal with unstructured situations *(Good for research, and good even if a students wishes to take up a job in industry)*

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- a targetted pollution measuring device for specific hazards, but extremely low cost, or
- a harvestor at one tenth of power, and one twentieth of cost, or
- a flood prediction system based on remote sensing?

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- a village electric power network (distributed grid), or
- a computer that interacts in human language, or
- a drug molecule with certain properties.

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We should be able to answer: Yes, you can (provided area is there).

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- To hook the students to *projects at an early stage* have
  - **Independent projects** with academic credits
- Not only allow/encourage projects, but also enable *supportive course work*
  - **Choice based flexible curriculum** becomes a necessity!

Curriculum should enable!

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- Curriculum design is not easy, but has been done!

Curriculum Design - Inspirational Dimension

- Challenge minds of the brightest students
- Allow them to explore new ideas
- Tap their enthusiasm
- Provide hands-on-skills

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- A: Special "Engg. Practice Courses" were designed!

Layered learning – practice-theory-practice!

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- Your own curriculum: Flexible choice of courses
- Honours program to specialize in a stream
- Dual-degree option to sustain research/innovation momentum in the stream

UG Honours Program

An optional program for the brightest. Duration 4-years.

- Choose a stream after 4 semesters
  - Elective course slots required in the 4th semester to allow the student to sample several areas
- Having chosen a stream, a student does the following:
  - Does honours projects
  - Takes 3 pre-defined courses in the stream area from 5th to 7th semesters
    - These courses could be compulsary or electives (for others students in the Dept.)
    - These courses are meant to *support projects*
- Publish research papers or build systems/devices - while being an undergraduate

Summary - Curriculum

For Research/innovation at undergraduate level, Curriculum role:

- **Research/innovation** orientation
- **Layered learning** - Practice-theory-practice
- **Hands-on-skills** provided
- **Honours Program** - Design curriculum with streams

Ordinances

Committee for UG Ordinances 2013

- Prof Devendra Kumar, Ceramic Engg – *Chairman*
- Prof Rekha Srivastava, Mathematical Sciences
- Prof Dhanesh Tiwary, Chemistry
- Dr R Manna, Metallurgical Engg
- Dr Chandan Upadhyay, Material Science & Technology
- Dr PC Pandey, Physics
- Dr Amritanshu Pandey, Electronics Engg

Committee for PG Ordinances 2013

- Prof GVS Sastry, Metellurgical Engg – *Chairman*
- Prof Rajiv Prakash, Material Science & Technology
- Prof B N Sarma, Metallurgical Engg
- Prof Sushil Kumar Singh, Pharmaceutical Engg & Tech
- Prof Rajeev Srivastava, Computer Science & Engg
- Prof RK Mishra, Electrical Engg
- Prof Prabhakar Singh, Physics
- Prof RS Singh, Chemical Engg & Technology
- Dr Subir Das, Mathematical Sciences

Saliant Features

- Credit system – Earning credits
- New grading scheme
- Relative grading

- Thesis credits – S/X
- Thesis evaluation

Teaching Organization

- Tutorials, UGs as Teaching assistants
- Moodle - Learning management system
- New methods in teaching – Teaching Learning Cell (Dec 2013)

Research & Innovation

Dean (Research & Development)

- Prof Rajiv Prakash (2013-14)
- Prof PK Jain (2014-17)
- Prof Rajiv Prakash (2017-)

In 2013-14, the position was called Prof-in-Charge rather than Dean.

R & D Committee

- Prof PK Jain, Dean (R&D) - *Chairman (15 Jul 2014 to 22 Dec 2017)*
- Prof Rajiv Prakash, SMST - *Chairman (23 Dec 2017 onwards)*
- Prof AK Jha, Mechanical Engg
- Prof B Mishra, Pharmaceutics
- Prof NK Mukhopadhyay, Metallurgical Engg
- Prof S Jit, Electronics Engg
- Prof Devender Singh, Electrical Engg

Coordinators - Innovation

- **Design Innovation Hub**
  - Dr Zaheer Khan Yusufzai, Mechanical Engg
- **Project Varanasi**
  - Prof Devendra Singh, Electrical Engg (2013-17)
  - Prof RS Singh, Chemical Engg (2017-)
- **Unnat Bharat Abhiyan**
  - Prof BN Rai, Chemical Engg
- **Design & Innovation Centre**
  - Dr Neeraj Sharma, Biomedical Engg

Design & Innovation Hub

Goal: Start the innovation engine

Initiate students into innovation

- **Summer projects**
  - Around 150 projects with 350 students every year
- **Support for major contests**
  – SAE all terrain vehicle, Efficycle, Electric vehicle, etc.
- **Tinkering labs.** in many depts.
- **Follow on projects** after summer
  - Support available (*)

Support also available through *Design & Innovation Center*

Project Varanasi

Goal: Societal applications.

Some ongoing or completed projects:

- **Environmental** – Pollution, traffic etc.
- **Languages of Purvanchal** – Machine translation (with BHU & IIIT Hyderabad)
- **Ramnagar Ramlila**
- **Jetty for Ganga and other rivers**
- **Ghats/City mapping**, documentation work, tourist circuit (with IIT Kharagpur)
- **Science education in schools** (with IIT Gandhinagar)

Research

- **Faculty research grants**
  - Individual research project
  - Thrust area project (group research)
- **Teaching lab modernization**
- **PhD fellowships** - Dramatic increase after becoming IIT

Institute Day

Annual **Institute Day** (started Feb 2015)

- **Display** research & innovation work through posters, demos
- **Recognition** of best student poster/demo through awards
- **Participation** steadily increasing (*)
- **Excellence in Teaching** award

Event held along with Technex (Student Gymkhana S&T event)

Research Infrastructure

- **Central Instrument Facility** (operational Apr 2015)
- **Central Computing and Information Services** (CCIS) (earlier name Computer Unit) (operational Apr 2017)
- **Campus Computer Network** (operational Sep 2017) (*)
- **Super Computer** - 650 tera flops *(expected Nov 2018)*

Computer Network Infrastructure Technical Committee

- Prof S Jit, Electronics Engg - *Chairman*
- Dr NS Rajput, Electronics Engg - Member
- Dr KV Srinivas, Electronics Engg - Member
- Dr B Biswas, Computer Sc & Engg - Member
- Dr HP Gupta, Computer Sc & Engg - Member
- Sri Mahesh Pandey, System Analyst, - Member
- Dr Devendra Pratap, Assistant Registrar (Accounts-I), - Member Secretary
- Sri PK Chakraborty, Former Coordinator, Computer Centre, BHU - Invited Member

Computer Unit Establishment Committee - 26 May 2017

- Prof Rajeev Srivastava, Computer Science & Engg, *Chairman*
- Dr Senthil Raja, Pharmaceutics Engg
- Dr RS Singh, Computer Science & Engg
- Mr Roshan Singh, System Analyst, Computer Unit
- Dr Amit Kumar Singh, Assistant Registrar - Member Secretary

Super Computer Committee - 29 Mar 2017

- Prof K K Shukla, Computer Science & Engg - *Chairman*
- Dr D Giri, Physics
- Dr AK Srivastava, Physics
- Dr SK Mishra, Physics
- Dr RS Singh, Computer Science & Engg
- Dr NS Rajput, Electronics Engg
- HP Gupta, Computer Science & Engg
- Sri Devendra Pratap, Assistant Registrar (Account-I) - Member Secretary

Conclusions

1. **Weaving research with teaching**
   – *Use curriculum with project work at all levels*
2. **Innovation engine running**
   – *Remains to connect to societal/industrial needs*
3. **Research direction will remain a faculty initiative**
   – *Are we working to be national pre-eminent group which will make a mark internationally?*

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Thank You