The greatest danger for most of us is not that our aim is too high and we miss it, but that it is too low and we reach it.

-- Michelangelo
Achievements & Future Directions

2014 Aug: 266 got degrees:

116 B.Techs.
34 M.Sc.
5 M.Phil
106 M.Tech.
5 Ph.Ds.

Overall Graduated 8 Ph.Ds,

4 Batches of M.Techs
1 batch of M.Phil
3 batches of B.Techs
3 batches of M.Sc.

Incoming Batch of B.Tech. students has 25% Girl students
Overall IITH has 20% girl students.
FACULTY

- 142 Faculty in 13 Depts.
- ~35% Ph.Ds. from US, Europe, Japan, ...
- ~60% faculty have US, European, Japanese ... Post Doc Experience
- ~80% faculty have sponsored research or consultancy projects
- Faculty retention extremely high
- Avg. teaching evaluation of faculty is 4.1 /5

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Departments</th>
<th>Asst. Prof</th>
<th>Assoc. Prof</th>
<th>Professor</th>
<th>Total</th>
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<tbody>
<tr>
<td>1</td>
<td>Bio-Medical Engineering</td>
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<td>13</td>
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<tr>
<td>4</td>
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<td>7</td>
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<td>1</td>
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<td>Computer Science and Engineering</td>
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<td>15</td>
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<td>7</td>
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<td>10</td>
<td>Material Science and Metallurgical Engineering</td>
<td>7</td>
<td>1</td>
<td></td>
<td>8</td>
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<td>Mechanical and Aerospace Engineering</td>
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<td>15</td>
<td>6</td>
<td>142</td>
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</table>

IITH HYDERABAD

Achievements & Future Directions 05
Dr. Kirti Sahu (Chem.E)
- Medal for Young Scientist 2013 from Indian National Science Academy (INSA)
- Young Associate 2012 from Indian Academy Sciences (IAS)
- Young Scientist Platinum Jubilee Award 2012 from National Academy of Sciences India (NASI)
- Nvidia Professor Partnership 2011

Dr. Sireesh Saride (Civil)
- Recipient of DST Young Scientist Award, Department of Science and Technology, 2012.

Dr. Thenmalarchelvi Rathinavelan (Bio-Tech)
- Innovative Young Biotechnologist Award from DBT, which was conferred by Minister of Science and Technology and Earth Sciences Sri. Jaipal Reddy on December 17, 2013 at New Delhi. (http://pib.nic.in/newsite/PrintRelease.aspx?relid=101919)
- Best Oral Presentation Award at Annual meeting of the Indian Biophysical Society January 2012, Chennai

Many more...
Faculty Development and Leadership

Summer visit to leading research labs at leading universities

- Purdue, UIUC, G.Tech., JHU, Univ. of Maryland, CUNY, Washington Univ., Univ. of Texas, UC-Santa Cruz, etc.
- Program for engineering faculty, science faculty, as well as liberal arts faculty.
- Priority to those who did their Ph.D. in India and did not have the exposure to research in US.

Program has been very successful. Lasting collaborations and faculty has been motivated for world class research leading to publications.

- Led to faculty awards too.

*Always exploring avenues for faculty development and faculty empowerment.*

Faculty leadership

- At IITH we believe leadership is developed by actually taking on tasks that involve leadership – learning by doing.
- **Large number of workshops, conferences and symposiums are organized by young faculty.**
  - Just recently faculty organized national workshops on Next Generation Health Care.
  - A Five Day Workshop cum Certificate Program on MEMS and NEMS.
  - Workshop on Big Data Analytics.
  - …
- Young faculty asked to take responsibilities like Faculty in-Charge Students, Chairman Cultural, Chairman Sports, Faculty in Charge Security, Faculty in Charge Sunshine Cell, etc. which help them build leadership qualities.
## Research Culture at IITH

### On going Sponsored Projects (Grant in Aid)

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Research and Consultancy</td>
<td>~115.11 crs</td>
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<tr>
<td>Patents Filed</td>
<td>13</td>
</tr>
<tr>
<td>Journal publications by IITH Faculty and students (as recognized by Scopus)</td>
<td>573</td>
</tr>
<tr>
<td>Reviewed Conference publication by IITH Faculty and students (as recognized by Scopus)</td>
<td>236</td>
</tr>
<tr>
<td>Presentation by IITH faculty at National and International conferences and reputed institutes</td>
<td>175</td>
</tr>
</tbody>
</table>
- Converged Cloud Communication (DEITY) (~20cr)
- Cyber Physical Systems (DEITY) (~17 cr)
- IoT for Smarter Health Care (DEITY) (~4cr)
- Self Powered Wireless Chipset for Building to Building Communication (DEITY) (~2cr)
- Cognitive Radio (DEITY) (~1.5cr)
- IUATC Project (DST) (~1.7cr)
  - WSN for pollution monitoring
  - Health Care
- Green Sensor Networks for Air Quality Support (DEITY) (~1cr)
- Development of FRET Enhanced Quantum Dot Sensitized Solar Cells (DST) (1.33cr)
- Improving the efficiency of Dense medium Cyclone treating high NGM coal using GPU based CFD and PEPT techniques (NMDC) (~1.6cr)
- Incremental Sheet Metal Forming: Predictive Modelling and Validation (Boeing) (~1.0cr)
- Evaluation of Fly Ash Treated Recycled Asphalt Pavement (RAP) for Base/Subbase Construction (DST) (~1cr)
# Labs at IITH

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Departments</th>
<th>Teaching Labs</th>
<th>Teaching / Research Labs</th>
<th>Research Labs</th>
<th>New Labs in the Pipeline</th>
<th>Total Labs</th>
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<tbody>
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<td>BME Labs</td>
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<td>BioTech Labs</td>
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<td>3</td>
<td>Chem Engrg. Labs</td>
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<td>-</td>
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<td>16</td>
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<td>2</td>
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<td>Civil Engrg. Labs</td>
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<td>Design Labs</td>
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<td>8</td>
<td>Elect. Engrg. Labs</td>
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<td>9</td>
<td>9</td>
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<td>Liberal Arts Lab</td>
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<td>Mech. &amp; Aero. Labs</td>
<td>4</td>
<td>8</td>
<td>1</td>
<td>2</td>
<td>15</td>
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<tr>
<td>13</td>
<td>Phy Labs</td>
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<td></td>
<td>5</td>
<td>3</td>
<td>12</td>
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<tr>
<td></td>
<td><strong>Total Labs</strong></td>
<td><strong>31</strong></td>
<td><strong>30</strong></td>
<td><strong>41</strong></td>
<td><strong>65</strong></td>
<td><strong>167</strong></td>
</tr>
</tbody>
</table>

**Total Labs** 102

**65 New Labs Planned in next 2 to 3 years**
Some Research Equipment
Cross-disciplinary research  A central focus at IITH

Research Centers
Cyber-physical systems
Nano-X (Inaugurated by Prof. C N R Rao)
X-Materials
High Performance Computing
Sustainable Development

In the Offing
Things to Bytes to Things
Smart Cities
Energy and Environment

Nano-X (Inaugurated by Prof. C N R Rao)
IITH-Industry Interaction

IIT-H has active collaborations and/or interactions with the following Industries:

- DRDO
- Hyundai Motors
- Mercedes-Benz R&D India
- HP
- Microsoft Research
- Xylinx Research
- NICT-Japan
- OFS-Alcatel
- KDDI Research labs-Japan
- CMC
- RCI
- ANURAG
- ELGI
- HCL technologies
- Redpine
- Intel
- Dr Reddy’s labs
- Singareni Colleries
- nVidia Technology
- Boeing (India)
- Infotech
- Samsung
- URMI
- many more

Conducted TECON 2014
The departments of Mechanical & Aerospace Engineering, Chemical Engineering and Materials Science & Engineering of IITH organized a one-day interaction event with industry.
ACADEMICS (Teaching)
Academic Departments: *In all 14 Departments*

### 9 Engineering Departments
- Department of Biomedical Engineering (M.Tech. 2012, Ph.D.)
- Department of Biotechnology (M.Tech. 2012, Ph.D.)
- Department of Chemical Engineering (B.Tech 2011, M.Tech and Ph.D.)
- Department of Computer Science and Engineering (B.Tech., M.Tech., Ph.D.)
- Department of Electrical Engineering (B.Tech., M.Tech., Ph.D.)
- *Department of Engineering Science (B.Tech 2012) (virtual department)*
- Department of Materials Science & Metallurgical Engineering (M.Tech., Ph.D., B.Tech. starting in 2014)
- Department of Mechanical and Aerospace Engineering (B.Tech., M.Tech., Ph.D.)

### Sciences
- Department of Chemistry (M.Sc., Ph.D.)
- Department of Mathematics (M.Phil 2012, Ph.D.)
- Department of Physics (B.Tech., M.Sc., Ph.D.)

### Liberal Arts (M.Phil. 2012, Ph.D.)
- Department of Design

### Department of Design

*Only new IIT to have a full bouquet of departments.*

### 8 Departments will offer B.Tech program from Aug 2014
- 3 departments offering M.Sc.
- 8 Departments offering M.Tech. programs
- 1 Department offering M.Phil. Program
- 1 Dept. will offer M.Des from Aug 2014
- 13 Departments offering Ph.D. programs
- B.Tech. Minor is all depts. including Economics, etc.
- Minor in Entrepreneurship for all
B.Tech. in Engineering Science

First of its kind in IIT system

I. To give more holistic exposure to engineering education

II. Fits into the T-Education Model

III. In order to ensure good job prospects, they will specialize in the discipline of their choice in the final year

IV. Such programs exist at only a few leading institutes in the world (UC-Berkeley, Harvard, Cambridge, UIUC, ...)

V. **Nevertheless, our program is fundamentally different because of the provision for specialization in any discipline.**

VI. For the first 2 years the student does basics courses in Math, Physics, Chemistry, and different fields of engineering.

VII. In the last 1.5 years (3 semesters) the student then specializes in any field of his/her choice -- specialization is open

VIII. It could be any branch of engineering -- Computer Science and Engineering, Electrical, Mechanical, Chemical, Civil, Material Science, BioTech, Biomed -- or Physics, or Mathematics, or Chemistry, or Economics, or Psychology, or Design, etc.

IX. The final degree will read: B.Tech. in Engineering Science with Specialization in XXX.

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## Minor in Entrepreneurship

**Unique Program at IITH**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Course Name</th>
<th>Credits</th>
<th>Instructor</th>
<th>Semester</th>
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<tr>
<td></td>
<td><strong>Semester 3.1</strong></td>
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<td></td>
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<tr>
<td>1</td>
<td>Introduction to Finance and Economy</td>
<td>1</td>
<td>Sri Nagesh</td>
<td>3rd Year, 1st Semester</td>
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<tr>
<td>2</td>
<td>Introduction to Sales &amp; Marketing</td>
<td>1</td>
<td>J. P. Sahu</td>
<td>3rd Year, 1st Semester</td>
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<tr>
<td>3</td>
<td>Introduction to Entrepreneurship</td>
<td>1</td>
<td>Ajai Chowdhry</td>
<td>3rd Year, 1st Semester</td>
</tr>
<tr>
<td></td>
<td><strong>Semester 3.2</strong></td>
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<td>4</td>
<td>Strategic Innovative Entrepreneurship</td>
<td>1</td>
<td>Ramesh Loganathan</td>
<td>3rd Year, 2nd Semester</td>
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<tr>
<td>5</td>
<td>Introduction to Business plan</td>
<td>1</td>
<td>Satish Andra / Srini Adepallli</td>
<td>3rd Year, 2nd Semester</td>
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<tr>
<td>6</td>
<td>Early Customer Acquisition and Relationship Management</td>
<td>1</td>
<td>Santanu Paul</td>
<td>3rd Year, 2nd Semester</td>
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<td><strong>Semester 4.1</strong></td>
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<tr>
<td>7</td>
<td>Business Plan Development (Project)</td>
<td>3</td>
<td>Murali Bukkapatnam and IITH Faculty</td>
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<td><strong>Semester 4.2</strong></td>
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<td>8</td>
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<td>B. V. R. Mohan Reddy</td>
<td>4th Year, 2nd Semester</td>
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<td>9</td>
<td>Company Valuation</td>
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<td>Hemant Kanakia</td>
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<td>1</td>
<td>Pradeep Mittal</td>
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<td></td>
<td><strong>Total Credits</strong></td>
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</tr>
</tbody>
</table>

**All instructors from Industry:**
- Entrepreneurs
- VCs
- Enterprise builders
- Industry Managers
Philosophy: The new program should capture ...

I. T-Education
  ◦ Breadth with Depth
II. Flexibility
III. Foster Interdisciplinarity
IV. Wider choice of electives
V. Foster Research at undergraduate level
VI. Synergy in projects – hopefully leading to products
VII. Students can pace their program
VIII. Student to design their program
IX. Greater choice for knowledge acquisition and specialization
X. Encourage creativity
  ◦ Bouquet of courses in Creative Arts (Music, Movie making, fine arts, photo journalism, performing arts, etc.)

BREADTH

DEPTH
Initial Attempts:

Fractional Credit courses Core idea proposed by Prof. Raj Reddy of CMU

I. Strong industry interaction.

II. A typical 3 lecture course has 3 credits leading to 42 lecture hours in a semester.

III. Fractional credits can be 0.5, 1, 1.5, 2.0, 2.5, 3.0 having 7, 14, 21, 28, 35 and 42 lecture hours respectively.

IV. Some examples of fractional credit courses that were offered in 2011-2012 and 2012-2013 academic year are:
   - Trends in Storage Systems (by NetApp)
   - Mobile Applications (by Adobe)
   - Advanced Mobile Communication Networking
   - Data Management and Computing on the Cloud
   - Empowering Three Billion (taught by former President Dr. Kalam)
   - Photo Journalism
   - Movie Making
   - Courses by Visiting Faculty in Math., EE, Mat. Sci., from USA and Europe
Fractal Academic Program

I. A novel academic program launched at IITH – we believe it is first of its kind
   ◦ Another such attempt is at Univ. of Chicago – The Institute of Molecular Engineering – Matthew Tirrel

II. At present only for Electrical Engineering and by 2014 for all B.Tech. Programs

III. Courses of only 1 or 2 credits

IV. Departmental courses in the very first year

V. Inherently Multidisciplinary

VI. Promotes R and D from an early stage

VII. Courses in Liberal Arts and Creative Arts

VIII. Holistic Education
Basic Building Blocks

Atomize the courses and programs

I. 1 credit courses for breadth
  ◦ Core courses

II. 1.5, 2, 2.5 credit courses for depth
  ◦ Specialize courses
  ◦ Electives
  ◦ Projects and building prototypes / products
  ◦ Bridging gulf between theory and practice
1 Credit Courses ...

- All core courses
- Helps interdisciplinary education
- Open to all students – allows for greater breadth
- Students have the option of greater number of interesting courses
- Allows students to better tailor their coursework and choose across Departments
- Large basket of non-technical courses (LA – Liberal Arts + CA-Creative Arts)
- Better access to a wide variety of courses increases exposure and preparedness for research
- Synergy in projects - foundation for product development
A balance is sought between technical and non-technical courses to reduce stress when students enter IIT Hyderabad.

The first two semesters expose students to all the basic tools required for the rest of their Bachelors' program.

*The curriculum potentially makes students ready for internship right after the first year.*

Outside specialization courses

- Photography
- Entrepreneurship
- Movie making
- Western classical music
- Drama
- Life science concepts
- Music and mathematics
- Space program
- Efficiency vs goodness
- Healthcare and technology
- Teamwork and collaboration
- ...

- Managing failure
- Deconstructing design
- Hindustani classical music
- Fine arts
- Basics of vision
- History of math
- History of science
- Carnatic classical music
- Linguistic abilities
- Personal Effectiveness
- Science, Society and Culture
- ...

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Science and Technology Breadth Courses

- Genomics
- Brain and cognition
- Big data
- Thermodynamics
- Molecular Communication
- Drug delivery
- Engineering in Biology
- ...

- Energy Storage Technologies
- Future Cities
- Singularities in Science and Technologies
- Semantic Web
- Future Materials
- Water
- ...

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Achievements & Future Directions
ILLUSTRATIVE FRACTAL CURRICULUM FOR ELECTRICAL ENGINEERING
<table>
<thead>
<tr>
<th>Semester 1 Courses (Credits) (Total Credits: 18)</th>
<th>Duration</th>
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<tbody>
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<td>1. Independent Project (1)</td>
<td>1/6, 2/6, 3/6, 4/6, 5/6, 6/6</td>
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<tr>
<td>2. Digital Fabrication (2)</td>
<td>1/6, 2/6, 3/6, 4/6, 5/6, 6/6</td>
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<tr>
<td>3. Introduction to Programming (1)</td>
<td>1/6, 2/6, 3/6, 4/6, 5/6, 6/6</td>
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<tr>
<td>4. Introduction to Programming Lab (2)</td>
<td>1/6, 2/6, 3/6, 4/6, 5/6, 6/6</td>
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<td>5. Calculus – I (1)</td>
<td>1/6, 2/6, 3/6, 4/6, 5/6, 6/6</td>
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<tr>
<td>6. Calculus – II (2)</td>
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<td>7. Classical Physics (1)</td>
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<tr>
<td>8. Boolean Algebra (1)</td>
<td>1/6, 2/6, 3/6, 4/6, 5/6, 6/6</td>
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<tr>
<td>9. Electric Circuits (1)</td>
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<td>10. Magnetic Circuits (1)</td>
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<tr>
<td>11. Signals and Communications (1)</td>
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<td>12. Bioengineering (1)</td>
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<td>13. Liberal Arts Elective (1)</td>
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<td>14. Creative Arts Elective (1)</td>
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<td>15. Free Elective 1 (1)</td>
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</table>

Each Semester Partitioned into 6 Segments each representing 0.5 credit.
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<th>Semester 2 Courses (Credits)</th>
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<tr>
<td>1. Independent Project (1)</td>
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<tr>
<td>2. Vector Calculus (1)</td>
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<td>3. Differential Equations (1)</td>
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<td>4. EM &amp; Maxwell's Equations (1)</td>
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<tr>
<td>5. Introduction to Data Structures (1)</td>
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<td>6. Introduction to Data Structures Lab (2)</td>
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<td>7. Matrix Analysis (2)</td>
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<td>8. Data Analytics (2)</td>
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<td>9. Basic Control Theory (1)</td>
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<tr>
<td>10. Digital Signal Processing (1)</td>
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<td>11. Semiconductor Fundamentals (1)</td>
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<td>12. Embedded Programming (1)</td>
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<td>13. Physiology for Engineers (1)</td>
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<tr>
<td>14. Liberal Arts Elective (1)</td>
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<tr>
<td>15. Creative Arts Elective (1)</td>
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<tr>
<td>16. Free Elective 1 (1)</td>
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*Each Semester Partitioned into 6 Segments each representing 0.5 credit.*
<table>
<thead>
<tr>
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<tr>
<td>2. Computer Organization (1)</td>
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<tr>
<td>3. Science Elective (1)</td>
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<td>4. Environmental Chemistry – I (1)</td>
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<tr>
<td>5. Chemistry Lab (2)</td>
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<tr>
<td>6. Device Physics (2)</td>
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<tr>
<td>7. Linear Electronics (1)</td>
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<tr>
<td>8. Digital Systems and Design (1)</td>
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<td>9. Digital Modulation Techniques (1)</td>
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<td>10. Information Science (1)</td>
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<td>11. Advanced DSP (2)</td>
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<td>13. Graph Theory (1)</td>
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<tr>
<td>16. Creative Arts Elective (1)</td>
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<td>17. Free Elective 1 (1)</td>
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*Each Semester Partitioned into 6 Segments each representing 0.5 credit.*
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<td>2. Complex Variables (1)</td>
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<td>3. Science Elective (1)</td>
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<tr>
<td>5. Smart Grid (1)</td>
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<tr>
<td>6. Optimization (1)</td>
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<td>7. AC Machines (1)</td>
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<tr>
<td>8. Power Electronics (1)</td>
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<td>9. Introduction to Multimedia (1)</td>
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<td>10. Channel Coding (1)</td>
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<tr>
<td>11. Advanced Analog Electronics (2)</td>
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<td>12. Embedded Systems (1)</td>
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<td>13. CMOS Fabrication (1)</td>
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<td>14. Control Systems (1)</td>
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<td>15. Computer Networks (1)</td>
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<td>16. Thin Films and Devices (1)</td>
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<td>18. Creative Arts Elective (1)</td>
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<td>19. Free Elective 4 (1)</td>
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Each Semester Partitioned into 6 Segments each representing 0.5 credit.
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<td>2. Science Elective (2)</td>
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<tr>
<td>3. Engineering Elective (2)</td>
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<tr>
<td>4. Random Processes (2)</td>
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<td>5. Power Electronics Analysis &amp; Design (1)</td>
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<td>6. Digital Chip Design (2)</td>
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<td>7. Core Elective 1 (2)</td>
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<td>8. Core Elective 5 (2)</td>
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<td>9. Electrical Machines Lab (2)</td>
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<td>11. Creative Arts Elective (1)</td>
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<td>12. Free Elective 5 (1)</td>
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<th>Semester 6 Courses (Credits)</th>
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<td>3. Engineering Elective (2)</td>
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<td>4. Power Systems Practice (2)</td>
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<tr>
<td>5. Cellular Networks (1)</td>
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<td>8. Core Elective 5 (2)</td>
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<td>9. VLSI Lab (2)</td>
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<td>12. Free Elective 6 (1)</td>
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Each Semester Partitioned into 6 Segments each representing 0.5 credit.
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<td>4. Core Elective 8 (2)</td>
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<td>5. Liberal Arts Elective (1)</td>
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<td>6. Creative Arts Elective (1)</td>
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<td>16. Free Elective 8 (2)</td>
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Each Semester Partitioned into 6 Segments each representing 0.5 credit.
<table>
<thead>
<tr>
<th>Semester 8 Courses (Credits)</th>
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<td>1. EE Independent Project (3)</td>
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<tr>
<td>2. Core Elective 9 (2)</td>
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<td>3. Core Elective 10 (2)</td>
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<tr>
<td>4. Core Elective 11 (2)</td>
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<tr>
<td>5. Liberal Arts Elective (1)</td>
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<td>6. Creative Arts Elective (1)</td>
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<td>16. Free Elective 10 (2)</td>
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</table>

Each Semester Partitioned into 6 Segments each representing 0.5 credit.
## Strength and Challenges of Fractal Academics

<table>
<thead>
<tr>
<th><strong>Strengths</strong></th>
<th><strong>Challenges</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Foster Creativity</td>
<td></td>
</tr>
<tr>
<td>Better exposure to larger number of topics</td>
<td></td>
</tr>
<tr>
<td>More flexibility in breadth and depth</td>
<td><em>Perhaps spreading too thin / losing focus?</em></td>
</tr>
<tr>
<td>Foster Interdisciplinary education and undergraduate research</td>
<td><em>Context switching / distracting?</em></td>
</tr>
<tr>
<td>Easier implementation of fast and slow track program</td>
<td></td>
</tr>
<tr>
<td>All round development - Holistic education</td>
<td></td>
</tr>
</tbody>
</table>
Counsellor on ad hoc basis has been appointed -- having a special office

In the process of recruiting a regular counsellor

Student Advisors

Faculty in Charge – Sunshine cell

Student Mentors – for every 8-10 students – one senior acts as a mentor -- Sunshiner

Training of Sunshiners implemented

Training session for faculty to focus on early detection
Student Activities

- **Clubs**
  - Nature Club
  - Cepheid: Astronomy Club
  - Endeavour: Science Documentary club
  - Arts Club
  - Torque: Automobile Club
  - Dance Club
  - Drama Club
  - Elektronica
  - Movie Club
  - Programming Club
  - Quiz Club
  - Music Club
  - Robot Club
  - **E-Cell**
    - Ideas to business workshop, biz pan competition, etc.

- **Students Teach at Zilla Parishad School and other schools in the neighbouring villages**

- **IITH alumni donated money to set up a computer lab at the Zilla Parishad School**

- **Open house for students of schools from villages**

- **Lot of cultural, techno and sports activities**
  - Elan
  - N-Vision
  - Fusion
  - IITH got talent
  - PAN IIT (Hyd) meet

- **Extramural Lectures**
  - Ira Trivedi, Amala Akkineni, Nagesh Kuknoor, Sashi Tharoor, ...
International Collaboration

- IIT-Hyderabad has MOUs with several foreign universities:
  - Purdue University
  - U of Illinois at Urbana-Champaign
  - Georgia Institute of Technology
  - Univ. of Southern California
  - UC-Santa Cruz
  - UC- San Diego
  - Univ. of Utah
  - University of Buffalo
  - NICT Japan
  - Osaka Univ.
  - Univ. of Tokyo
  - Tahoka Univ.
  - Ritsumeikan Univ.

- Foster exchanges of faculty and graduate students, joint research, short term programs and visits.
Active Collaboration with Japan

- Several building on IITH campus to be built with JICA support
- Some iconic buildings to be designed by Japanese Architects
- Very Active student and Faculty Exchange – under Friendship Program
- R and D Collaboration in 5 Areas:
  - Next Generation Communication Technologies
  - Sustainable Development
  - Manufacturing and Design
  - Nano-Science and Nano-Technology
  - Energy and Environment
- Sponsored project from KDDI, Hitachi - Japan
DISANET: Information Network for Natural Disaster Mitigation and Recovery

- Indo-Japan Collaborative Project
- Duration: 5 years, Cost Rs 20 Crores (~4mil US$)
- IIT Hyderabad + Keio University + Univ. of Tokyo Partnership
- Other key institutions on the Indian side
  - IIT Madras, IIT Kanpur, NGRI, IMD and IIIT Hyderabad
- Areas of Focus
  - Earthquake monitoring
  - Strong Motion sensors installed in the foothills of Himalayan region (see map)
  - Weather monitoring and sensor technology
  - Wireless broadband communication systems
  - Data management and security
CAMPUS DEVELOPMENT
The master plan for IIT Hyderabad campus envisioned for a accommodating future growth. Design vision envisages a campus as...

- A crucible of interdisciplinary research
- Promotes a sense of excellence
- Inspire Inventions and Innovations

- A campus with modular flexibility for expansion
- A resource efficient green campus
- A campus with harmonious learning and living environments
- A campus with sound and efficient infrastructure
- An energy efficient campus from planning to building level

- Total Campus Area: ~570 Acres
- Academic Departments / Schools: ~30 nos (13 current)
- Total Population – 30,000:
  - 20,000 students + 10,000 Faculty, Staff, their families
- Phase 1: ~500 thousand square feet (approx. plinth area)
- To accommodate 6000 students by 2017
and ....

- Academic buildings
- Faculty and staff housing
- Hostels
- Research Centers
- International house
- Administration Building
- Sports facilities
- Auditorium
- Library
- Schools
- Medical facility
- Shopping
Vision ...

- A campus with a small footprint and vertical skyline
  - Academic buildings: 30m
  - Residential building: 60m
  - Hostels: 30m

- Architecture that inspires
  - Modern/Post-Modern
  - Brutalist

- New materials and structural systems
  - Exposed concrete and steel
  - Post-tensioned systems
  - Precast construction

- 10 million plus person-hours without any incident
- Recently got GRIHA Award: Exemplary project for ‘Construction Workers Health and Safety’
Novel Model for Campus Development

Architects
- ARCOP
- CCBA
- Astute / GMP
- Japanese Architects

Tata Consulting Engineers
- Project Management Consultant

BSNL
- Bid Consultant and GoI Compliance

Construction Company

L & T
A Futuristic Campus in the Making
Lecture Hall Complex

Christopher Charles Benninger
Innovative Classrooms: Collaborative Classroom
Civil Engineering Department
Mechanical Engineering Department

Arcop Architects
Chemical Engineering Department

Arcop Architects
Liberal Arts Department

Designed by Christopher Charles Benninger
EE and CSE Complex

Designed by Christopher Charles Benninger
Faculty Housing

17 floors – 3 flats per floor

Designed by Christopher Charles Benninger
Hostel

GMP – Astute: Designed by Margret Boethig

Total of 1952 rooms
Out of which 32 rooms for physically challenged people
Hostels: Each Pod has 8 rooms -- Concept of a Dwelling
Hostel

GMP - Astute
Married Student Hostel

Margret Boethig (GMP/Astute)
Dining Hall

Capacity 1000 students at a time

GMP - Astute
GMP - Astute
Students Commons: Concept Design

G-1
Main Building (Admin Building)

GMP-Astute:
Designed by Margret Boethig
Knowledge Centre (Library)

Designed by Prof. Kawazoe
Knowledge Center (Library)
Knowledge Center (Library)
Research Center Complex

Designed by Prof. Ohno

IITHHYDERABAD
Convention Village

Designed by Prof. Ohno
Technology Incubation and Research Park

Designed by Prof. Kawazoe
International Guest House

Designed by Prof. Ohno
Sports and Cultural Complex

Designed by Prof. Ohno
Ongoing Work
Possible Modes of Collaborations with Industry or Individual Philanthropist or IIT Alumni

- **Becoming Stake Holders**
- **Helping establish linkages with institutions**
- **Jointly setting up of state of the art research centers**
- **Industry sponsored projects**
- **Mentorship to budding entrepreneurship**
- **Setting up of Chair for Professors / Assistant Professors**
- **Support for establishing a corpus for IITH**
Possible modes for collaborations with universities overseas

- Student exchange (two way)
- Summer Internship (two way)
- Faculty exchange (two way)
- Honorary Chair Professorship at IITH (two way)
- Adjunct Faculty (two way)
- Offering of highly specialized modules (Fractional Credit Courses)
- Bidding for joint projects
- Establishment of Research Centers in cutting edge areas
- Member of Doctoral Committee of Ph.D. students
- Co-Guiding of Ph.D. students
- Any other avenues which could lead to a Win-Win situation
SOME FUTURE PLANS
Research, Innovations, Design, Incubation

Creating a culture of
- Research / Innovations
- Multidisciplinarity
- Entrepreneurship

Making design as part of the IITH ecosystem

Fine Arts, Performing Arts, as part of IITH Landscape

Incubation
- Already set in process. Society– IITH Technology Incubator is being formed
Some Multi-Disciplinary Thrust Areas

- Things 2 Bytes 2 Things (Digital Fabrication)
- Cyber Physical Systems / Internet of Things (IoT)
- Cloud Converged Communication
- Smart Cities (Sustainable Development)
- Sensor Technologies
- Big Data Analytics
- Fabless Chip Design
- Sustainable Mineral Processing & Utilization
- e-Mobility
- Part of Mega Physics Projects at KEK (High Energy Accelerator – Japan), Fermilab, CERN
- Social Engineering
Innovations in Academics

Need to create a novel academic program
- Fractal Academics
- Flip Teaching – will fit in very well with Fractal Academics
- An Experiential learning model
  - i-school kind of model
  - Bring in design thinking (design spine)

Developing an innovative program that focusses on and encompasses:
- Leadership
- Entrepreneurship
- Flexibility and Mobility

Executive Program at PG level
- Will help enhance industry interactions

Increase international collaboration
- Start a program jointly with a leading international university
Wilhelm von Humboldt on the future University of Berlin (1810, cited by Elton, 2005, 110)

“... universities should treat learning as not yet wholly solved problems and hence always in research mode”