BoG/2007-08: 1.10 – <u>Recommendations of the Buildings & Works Committee</u>

The next meeting of the Buildings & Works Committee (B&WC) is scheduled to be held on May 10, 2007. Recommendations of the Building & Works Committee arrived at in the meeting shall be placed before the Board in the meeting itself.

BoG/2007-08: 1.11 – <u>Recommendations of the Finance Committee</u>

The next meeting of the Finance Committee is scheduled to be held on immediately before the meeting of the Board on May 11, 2007. Recommendations of the Finance Committee arrived at in the meeting shall be placed before the Board in the meeting itself.

BoG/2007-08: 1.12 – <u>Status of the Undergraduate Curriculum of IIITDM Jabalpur</u>

The canvas of manufacturing activities is indeed very large and can not e viewed from a very narrow perspective. The modern manufacturing is intimately linked with (i) product design and (ii) process design. Creating a manpower which understands these issues and is capable of implementing them in terms of developing practicable methodologies is the real challenge of engineering education. It pertains developing a curriculum where the subjects pertaining to science, engineering, technology, arts, aesthetics and humanities are coherently interwoven.

The scope of Information Technology is also wide and needs to be effectively linked with different themes. In spite of its perceptible linkages with Design & Manufacturing, the engineering curriculum in existing universities/institutes has not been developed from the point of view of combining IT, Design & Manufacturing. During our interaction with the Japanese experts, it was observed that this problem exists even in Japanese educational system. The task of developing the undergraduate curriculum of IIITDM Jabalpur therefore is a daunting task.

The Institute admitted its first batch of undergraduate students in August 2005 in three disciplines namely: (1) Computer Science & Engineering (CSE), (2) Electronics & Communication Engineering (ECE) and (3) Mechanical Engineering (ME). Since first and second year students are generally required to do most courses belonging to sciences and engineering sciences, a rough contour of UG Curriculum, referred to as **Version I**, was accepted by the Senate.

In view of the intricacy of the job requirements, the following UG Curriculum Committee was constituted on June 1, 2007:

1. Prof GK Lal, Emeritus Professor of Mechanical Engineering, IIT Kanpur (Chairman)

2. Prof Raghuvir Sharan, Professor of Electronics, LNM IIT Jaipur
3. Professor Avinash Joshi, Professor of Electrical Engineering, IIT Kanpur

4. Prof Somenath Biswas, Professor of Computer Science & Engineering and Dean of Faculty Affairs at IIT Kanpur
5. Prof Phalguni Gupta, Professor of Computer Science & Engineering and Head, Computer Center at IIT Kanpur
6. Prof Amitabh Sanyal, Professor of Computer Science & Engineering at IIT Bombay

7. Prof Vinayak Eswaran, Professor of Mechanical Engineering at IIT Kanpur
8. Prof Nalinaksh S Vyas, Professor of Mechanical Engineering at IIT Kanpur

9. Prof S Sangal, Professor of Materials & Metallurgical Engineering and Head, Advanced Center for Materials Science (ACMS) at IIT Kanpur
10. Prof Manoj Kumar Harbola, Professor of Physics at IIT Kanpur
11. Prof Chandrashekhar Upadhyaya, Associate Professor of Aerospace Engineering at IIT Kanpur

Prof M Bhattacharya, former Director of IT BHU and former Vice Chancellor of WBTU, who earlier was a professor of Electrical Engineering at IT BHU, was also incorporated in the Committee.

After a brief meeting of the Curriculum Committee in IIT Kanpur in the first week of June 2006, the Committee met in Delhi on June 16, 2006. Unfortunately, due to the busy schedule of its members, the Committee could not meet during Semester I, 2006-07.

In the mean time, since the UG Curriculum of the Institute was to be discussed with the Japanese experts in November 2006, the outline of the curriculum was developed by the faculty of IIITDM Jabalpur. The outline of this curriculum, referred to as **Version II**, was developed on the basis of preliminary discussions of the UG Curriculum Committee in the meetings held in June 2006.

Version II of the UG Curriculum became the basis of discussion with the Japanese experts in Tokyo in November 2006. While Prof Manabau Kiuchi, Emeritus Professor of Mechanical Engineering at the University of Tokyo and Prof Yoshimi Ito, Emeritus Professor of Mechanical Engineering at the Tokyo Institute of Technology participated in the discussions from the Japanese side, Prof Sanjeev Bhargava, Prof Somenath Biswas and Dr Puneet Tandon (Associate Professor at IIITDM Jabalpur) participated from the Indian side. The UG Curriculum proposed during these deliberations is referred to as **Version III**.

The UG Curriculum Committee of IIITDM Jabalpur met in April 2007 and critically examined Version III of the curriculum and suggested a few minor modifications in the same. The curriculum recommended by the Committee is referred to as **Version IV**. Semester by semester courses suggested in **Version III** and **Version IV** are shown on **pages 26 - 29.**

The UG Curriculum Committee is again scheduled to meet in IIT Kanpur on May 8-9, 2007. The Board shall be informed about the deliberations of this meeting in the Board meeting itself.

Comparison between the Curriculum Structures worked out by (A) the Indo-Japanese Team (Curriculum Structure III) and (B) the Curriculum Committee of IIITDM Jabalpur (Curriculum Structure IV)

CURRICULUM STRUCTURE IV

(Worked out by the Curriculum Committee of IIITDM Jabalpur in a Meeting held on April 06, 2007 at IIT Kanpur)

Semester I (24 Hours/week)

- Mathematics for Continuous Domain I (3 L + 1T)
- Engineering Physics I (2L + 1T)
- Fundamentals of Computing (2L + 1T)
- Engineering Graphics* (2L + Lab (3hRs)
- Basic Principles of Electrical Engineering (3L + 1T)
- Communication & English for Engineers (1L + 1T)/ HSS Elective/Language Lab
- IT Workshop I (Computing Lab)

* This course is offered in Semester II of Curriculum Structure III.

Semester II (27 Hrs/week)

- Mathematics for Continuous Domain II (3L + 1T)
- Engineering Physics II (2 L + 1T + 2 Hours Lab)
- Thermodynamics* (3 L + 1 T)
- Materials Design & Processing (3L + 2 Hours Lab)
- Engineering Literacy (1L + 3 Hrs Lab)
- Culture & Human Values/HSS (2L)
- IT Workshop II (3 Hours Lab)

* This course does not exist in the Curriculum Structure III.

CURRICULUM STRUCTURE III

(Worked out jointly by the Teams from Japan and India on November 12, 2007 in the Meeting held in Tokyo)

Semester I

- Mathematics for Continuous Domain I
- Engineering Physics I
- Fundamentals of Computing
- Chemistry for Engineers*
- Basic Principles of Electrical Engineering
- Communication & English for Engineers
- IT Workshop I (Computing Lab)

* This course is all together dropped in the Curriculum Structure IV.

Semester II

- Mathematics for Continuous Domain II
- Engineering Physics II
- Fundamentals of Computer Systems*
- Engineering Graphics
- Materials Design & Processing
- Engineering Literacy
- Culture & Human Values/HSS
- IT Workshop II

* This course is not a core course in the Curriculum Structure IV. Instead, it becomes Professional Course I for CSE students and is to be offered in Semester III

Semester III (26 Hours/Week)

- Mathematics for Discrete Domain (3L + 1T)
- Data Structures and Algorithms (3L)
- Basic Principles of Electronics (3L + 1T)
- Fundamentals of Manufacturing Processes & Production Morphologies (3L + 3 Lab)
- Professional Course I (2L + 1T):

  Solid Mechanics* [ME]
  Fundamentals of Electromagnetic Theory* [EC]
  Fundamentals of Computer Systems* [CSE]

- Electronics Lab (3 Lab)
- IT Workshop III (3 Lab)

*   These two courses are core courses in the Curriculum Structure III.
*   This course does not exist in Curriculum Structure III.

Semester IV (25 Hours/week)

- Engineering Design (3L + 1T)
- Computer Graphics, Simulation & Visualization (3L)
- Signals, Systems and Networks* (3L + 1T)
- Arts and Aesthetics (2L + 2 Hours Lab)

- Professional Course II (3L + 1T):
  Dynamics and Vibrations of Mechanical Systems* [ME] (3L + 1 T)
  Principles of Operating Systems* [EC, CSE]
- Mechanical Engineering Lab (3 Hrs)

- IT Workshop IV (3Hrs)

*   This is not a core course in Curriculum Structure III. It is Professional Course for EC stream and is offered in Semester V.

*   This is Professional Course I for CSE stream in the Curriculum Structure III and is offered in Semester V.

Semester III

- Mathematics for Discrete Domain (3L + 1T)
- Data Structures and Algorithms (3L)
- Basic Principles of Electronics (3L + 1T)
- Fundamentals of Production Morphologies (3L + 3 Lab)
- Solid Mechanics & Kinematics of Machines*
- Engineering Economics*
- Electronics Lab (3 Lab)
- IT Workshop III (3 Lab)

*   This course is not a Core Course in Curriculum Structure IV. Partly, it becomes Professional Courses I & II for ME students in the Curriculum Structure IV.
*   This course is not a compulsory course in Curriculum .Structure IV.

Semester IV

- Design: Theory & Practice
- Computer Graphics, Simulation & Visualization
- Principles of Communication*
- Arts and Aesthetics
- Thermal, Fluid & Tribological Engineering*
- Management Principles & Techniques*
- Mechanical Engineering Lab (3 Hrs)
- IT Workshop IV (3Hrs)

*   This course is not a core course in Curriculum Structure IV. It is offered as Professional Course III for EC stream in Semester V.

*   This course is not a core course in Curriculum Structure IV. It is offered as Professional Course III for ME stream in Semester V.

*   This course is shifted to Semester V in Curriculum Structure IV.

Semester V (26 Hours/week)

- Control Systems: Theory, Software and Hardware (3L + 3 hours Lab)
- Management: Concepts & Techniques (3L)
- Professional Ethics (1L)
- Core Elective I* (3L):
  Numerical Methods/ Computer Vision & Image Processing/ Probability & Statistics/ …..
- Core Elective II* (3L):
  Applied Chemistry/ Modern Physics/ …..
- Professional Course III (3L + 1T):
  Fluid Mechanics & Heat Transfer [ME]
  Principles of Communications [EC]
  Database Design and Management [CSE]
- Project I (Design Project) (6 Hours Lab)

* The Concept of Core Elective does not exist in Curriculum Structure III.
* This course is offered in Semester IV in Curriculum Structure III.

Semester VI (26 Hours/week)

- Mechatronics & Robotics (3L + 2 Hours Lab)
- Sensing: Methods, Devices and Applications (3L)
- Management of Production Systems (3L)
- Professional Course IV (3L):
  Design of Mechanical Components [ME]
  Digital Signal Processing [EC]
  Compiler Design [CSE]
- Professional Course V (3L):
  Energy Conversion Devices* [ME]
  Digital Electronics & Microprocessor Technology[EC]
  Design and Analysis of Algorithms [CSE]
- Professional (ME/EC/CSE) Lab I (3 Hours)
- Project II (Fabrication Project) (6 Hours)

* This course in lieu of Professional Course VI for ME, *Energy and Supply Systems* in Curriculum Structure IV.
* This course is Professional Course IV for EC stream in Semester VII of Curriculum Structure III.
* This course is in place of *Production & Operation Management* of Curriculum Structure IV

Semester V

- Production & Operations Management*
- Database Design & Management
- Control Systems: Theory, Software and Hardware
- Micro- Nano-Science & Engineering*
- Engineering Ethics*
- Professional Course I:
  Dynamics and Vibrations of Mechanical Systems [ME]
  Signals, Systems & Networks [EC]
  Principles of Operating Systems [CSE]
- Project I (Design Project)

* This course is offered as *Management of Production Systems* in Curriculum Structure IV.
* In Curriculum Structure IV this course is offered in Semester VII.
* This course is offered as *Professional Ethics* in Curriculum Structure IV.

Semester VI

- Computer Vision & Image Processing*
- Mechatronics & Robotics
- Sensing: Methods, Devices and Applications
- Professional Course II:
  Design of Mechanical Components [ME]
  Microelectronics [EC]
  Compiler Design [CSE]
- Professional Course III:
  Agile Computer Integrated Manufacturing [ME]
  Digital Electronics & Microprocessor Technology [EC]
  Design and Analysis of Algorithms [CSE]
- Professional (ME/EC/CSE) Lab I (3 Hours)
- Project II (Fabrication Project) (6 Hours)

* This course is offered as one of the Core Electives in Semester V of the Curriculum Structure IV.
* This course is Professional Course VI for EC stream in Semester VII of the Curriculum Structure III.
* This course is replaced by Professional Course X for ME stream, *Computer Integrated Manufacturing* in Curriculum Structure IV.

Semester VII (24 Hours/week)

- Micro-Nano Science and Technology (3L)
- Professional Course VI: (3L)
  - Computer Aided Design [ME]
  - Microelectronics [EC]
  - Object-Oriented Design & Analysis [CSE]
- Professional Course VII: (3L)
  - Design of Mechanical Systems [ME]*
  - Power Electronics [EC]
  - Artificial Intelligence [CSE]
- Professional Course VIII: (3L)
  - Finite Element Methods/Computational Fluid Dynamics [ME]*
  - Electronic Devices: Theory & Applications [EC]
  - Computer Networks [CSE]
- Professional Elective I (3L)
- Professional (CSE/ME/EC) Lab II (3 Hrs)
- Advanced Project I (6 Hrs)

* These courses do not exist in Curriculum Structure III.

Semester VIII (24 Hrs/week)

- Professional Course IX: (3L)
  - Advanced Manufacturing Processes & Technologies [ME]
  - VLSI: Design & Testing [EC]
  - Design & Validation of Software Systems [CSE]
- Professional Course X: (3L)
  - Computer Integrated Manufacturing [ME]
  - Applications of Electromagnetics [EC]
  - Distributed and Fault Tolerant Systems [CSE]
- Professional Elective II (3L)
- Elective III (3L)*
- Elective IV (3L)*
  * Engineering Economics/ Industrial Psychology/ Business Models for Manufacturing/ Enterpreunership & Technology Management..
- Professional (CSE/ME/EC) Lab III (3 Hrs)
- Advanced Project II (6 hrs)

* These Elective Slots do not exist in Curriculum Structure III.

Semester VII

- Entrepreneurship & Technology Management*
- Professional Course IV:
  - Computer Aided Geometric Design [ME]
  - Digital Signal Processing [EC]
  - Object-Oriented Design & Analysis [CSE]
- Professional Course V:
  - Advanced Manufacturing Processes & Technologies [ME]
  - Communication Systems [EC]
  - Artificial Intelligence [CSE]
- Professional Course VI:
  - Energy and Supply Systems [ME]
  - Electronic Devices: Theory & Applications [EC]
  - Computer Networks [CSE]
- Elective I
- Professional (CSE/ME/EC) Lab II (3 Hrs)
- Advanced Project I (6 Hrs)

* This course is all together dropped from the Curriculum Structure IV. It is suggested to be one of the elective courses.
* This course is to be offered as *Computer Aided Design* in Curriculum Structure IV.
* This course is offered in Semester VII as Professional Course X in Curriculum Structure IV.
* Part of this course will be covered in Professional Course III of Curriculum IV.

Semester VIII

- Professional Course VII: (3L)
  - Design & Evaluation of Production Systems [ME]*
  - VLSI: Design & Testing [EC]
  - Design & Validation of Software Systems [CSE]
- Professional Course VIII: (3L)
  - Business Models for Manufacturing [ME]*
  - Applications of Electromagnetics [EC]
  - Distributed and Fault Tolerant Systems [CSE]
- Professional Elective II (3L)
- HSS/LAE Elective III (3L)*
- Professional (CSE/ME/EC) Lab III (3 Hrs)
- Advanced Project II (6 hrs)

* These courses do not exist as compulsory courses in Curriculum Structure IV.

BoG/2007-08: 1.13 – <u>Status of the Japan-India Cooperation for IIITDM Jabalpur</u>

The Memorandum for the Japan-India Cooperation for IIITDM Jabalpur was signed during the Tokyo visit of Shri Manmohan Singh, the Honorable Prime Minister,during December 2006.

Four Japanese experts, namely (1) Prof Yoshimi Ito from the Tokyo Institute of Technology, (2) Dr Kazifumi Uda from the Kanagawa Institute of Technology, (3) Dr H Eishi Ibe, Chief Researcher, Production Engineering Research Laboratory (PERL), Hitachi, Ltd, Tokyo and (4) Dr.-Eng. Toshijiro Ohashi, Senior Researcher, Production Engineering Research Laboratory (PERL), Hitachi, Ltd. visited the Institute in the month of March 2007 and gave several lectures to our students. These lectures are being prepared as part of the course – *Overview of Engineering Systems/Engineering Literacy* which will be a unique course at IIITDM Jabalpur and was included in the UG Curriculum after deliberations in the meeting held at Tokyo. The suggestion has also come from the Japanese experts that contents of these lectures be soon converted in the form of a book which should be published under the banner of IIITDM Jabalpur.

The budgetary requirements for meeting out the expenses pertaining to the exchange visits from the two sides was proposed by the Institute (Attached on **pages 31 - .**). Based on the proposal the requirement for the visits of 6 experts from the Japanese side and that of 2 faculty members from the Indian side has been approved by the Government of Japan for the year 2007-08.

AN OUTLINE OF THE PROJECT ABSTRACT
(for submission of preliminary project report)

1. **Name of the project:**

   Development of the Indian Institute of Information Technology, Design & Manufacturing, (IIITDM) Jabalpur through Japan India Collaboration

2. **Sectoral Area:**

   Promoting collaborative research in the areas of IT enabled Design and Manufacturing of engineering products through the education in Engineering and Science

3. **Total Financial Outlay:**

   Rs 758 lacs (as per details given in the following Table)

   (excluding (1) the salary components of the Japanese experts and (2) perdium for the faculty members/research staff of IIITDM Jabalpur during their stay in Japan)

Expenditure Head	2007-08	2008-09	2009-10	2010-2011	2011-12
Travel Cost of Japanese Side	Rs 7 lacs	Rs 16 lacs	Rs 17 lacs	Rs 19 lacs	Rs 21 lacs
Local Hospitality of Japanese Visitors (Accommodation + Local Transport)*	Rs 14 lacs	Rs 32 lacs	Rs 34 lacs	Rs 38 lacs	Rs 42 lacs
Salaries + Compensation of Japanese Visitors	As per norms in Japan	As per norms in Japan	As per norms in Japan	As per norms in Japan	As per norms in Japan
Travel Cost from the Indian side	Rs 6 lacs	Rs 12 lacs	Rs 20 lacs	Rs 30 lacs	Rs 40 lacs
Perdium for Indian Visitors	As per norms in Japan	As per norms in Japan	As per norms in Japan	As per norms in Japan	As per norms in Japan
Conference/Workshops in India	Rs 25 lacs	Rs 25 lacs	Rs 30 lacs	Rs 35 lacs	Rs 40 lacs
Contingency	Rs 10 lacs	Rs 20 lacs	Rs 25 lacs	Rs 30 lacs	Rs 35 lacs
Miscellaneous	Rs 10 lacs	Rs 15 lacs	Rs 30 lacs	Rs 35 lacs	Rs 45 lacs
Total*	Rs 72 lacs	Rs 120 lacs	Rs 156 lacs	Rs 187 lacs	Rs 223 lacs

* Excluding the salary components of the Japanese experts and perdium to faculty members

4. **Details of the external development agencies and the amount sought from each:**
   Ministry of Foreign Affairs (MOFA), Govt of Japan through ODA, JICA or any other agency.

5. **Financial arrangement:**

Total external assistance	Counterpart funds being made available by				Total
	Implementing agency	State Government	Central Government	Others if any	
Rs 498 lacs	Rs 268 lacs				Rs 758 lacs

6. **Project Duration (dates/months/years):**

01/04/2007 – 31/03/2012

7. **Location of Project:**

Jabalpur, India

8. **Previous Phases, if any:**

None so far

9. **Statutory clearances required:**

For establishing the Institute and admitting students for running various academic programmes the following statutory requirements are

1. Registration of the Institute under the Society Registration Act
2. Allotment of Land by the Government for building the campus of the Institute

10. **Statutory clearances obtained:**

1. As part of the statutory requirement, the Institute has been established under the Society Registration Act by the Ministry of Human Resources Development (MHRD), Government of India. The Institute has been functioning from the Jabalpur Engineering College, as per requirements of the Society Registration Act, since January-February 2005.

2. The Government of the state of Madhya Pradesh has been handed over a piece of land measuring about 250 acres to the Institute. The work of construction of the campus has also begun.

11. **Details of feasibility studies done, if any:**

The understanding to help IIITDM Jabalpur in its development was reached between the two countries during the visit of the Honorable Prime Minister of Japan, Mr Junichiro Koizumi to New Delhi, India in April 2005.

Since then, both the Indian as well as the Japanese sides have regularly interacted with each other. Several meetings to this effect were held between them in New Delhi, Jabalpur, Kanpur and Tokyo. Responses from the Japanese universities/ institutes/industries regarding cooperation with IIITDM Jabalpur, as obtained during the visit of the delegation from IIITDM Jabalpur during November 2007, were highly positive and encouraging.

The undergraduate curricula for the students of the three disciplines, namely Mechanical Engineering (ME), Computer Science & Engineering (CSE) and Electronics & Communication Engineering (ECE) were jointly worked out between Japanese and Indian experts in November 2006. The curricula agreed upon are given as Annexure I.

At the same time, the following team of programme leaders for individual disciplines was proposed by the Japanese which was readily accepted by the Indian side:

- Programme Leader-in-Chief:
  Dr. -Eng., M. Kiuchi, Professor Emeritus of the University of Tokyo
- Programme Leader in Mechanical Engineering:
  Dr.-Eng., Y. Ito, Emeritus Professor of the Tokyo Institute of Technology
- Programme Leader in Electronics:
  Dr.-Eng., T. Nanya, Professor of the University of Tokyo
- Programme Leader in Computer Science & Engineering:
  Dr Suzuki, Technology Executive, Japan GE Energy

Based on these exchanges between the two sides, a Memorandum for the cooperation between the two sides was signed during the visit of the Honourable Prime Minister of India, Shri Manmohan Singh, to Japan in December 2006. Copy of the Memorandum is attached as Annexure II.

12. Implementing agency:

Indian Institute of Information Technology, Design & Manufacturing (IIITDM) Jabalpur will be the implementing agency for the project.

13. Basic Design of the Project:

Goals and objectives

- Helping IIITDM Jabalpur in developing its unique curriculum pertaining to Design & Manufacturing aspects of engineering products and overseeing its implementation by facilitating visits of the Japanese faculty members/ specialists/ academicians to IIITDM Jabalpur, subject to the availability of such experts and mutual convenience of the two sides.

- Training of faculty members/research staff/students of IIITDM Jabalpur by facilitating their visits to the Japanese universities/institutes/industries over short/extended periods subject to the available capacity of each accepting institute/organization in Japan.

- Helping IIITDM Jabalpur in establishing its research ethos by holding joint international conferences/workshops/seminars either in Japan or in Jabalpur, India.

Activities involved

A.   Visits of the Japanese Experts to Jabalpur, India.

During the visit of the Indian Delegation to Tokyo in November 2006, it was mutually agreed upon that the Japanese side would *try* to send experts to IIITDM Jabalpur for assistance in teaching of the following courses

- Overview of Engineering Systems/ Engineering Literacy
- Computer Graphics, Simulation & Visualization
- Control Systems: Theory, Software and Hardware
- Micro-Nano Science and Engineering
- Computer Vision & Image Processing
- Mechatronics & Robotics
- Sensing: Methods, Devices and Applications
- Microelectronics
- Agile Computer Integrated Manufacturing

- Advanced Manufacturing Processes & Technologies
- Energy and Supply Systems
- Electronic Devices: Theory & Applications
- Design & Evaluation of Production Systems
- VLSI: Design & Testing
- Business Models for Manufacturing

Visits of faculty members/academicians from the Japanese universities/institutes/ industries, made over an extended period, will be utilized for developing the pedagogy of teaching under the new and mutually agreed paradigm of engineering education in the areas mentioned above.

B.   Visits of Faculty Members/Research Staff/Students from the Indian Side to the Members of Consortium

In contrast, the visits of faculty members/research staff/students from IIITDM Jabalpur, made generally during the summer vacation at the Institute, shall be utilized for conducting joint research work on mutually agreed projects and thus would help in the training of personnel from the Indian side.

C.   Organization of Joint International Conferences/Workshops/Seminars

Short visits from both the sides shall be made for the joint international conferences/workshops/seminars.

Outputs of the project

- The collaboration at IIITDM Jabalpur will lead to a better cooperation in joint research programmes between the two sides. While India will be benefited by exposing young Indian minds to the Japanese culture of carrying out research in advanced areas, the Japanese side will be benefited by getting meaningful research output from the bright Indian minds whose analytical skills have been recognized all over the world.

- The collaboration in the teaching programme will help the Indian side to appreciate some of the unique aspects of the Japanese style of functioning in its industry and R&D organizations. Till now the educational features in Indian institutes have been mainly guided by the approach followed in USA, Canada and Europe.

- The curriculum structure jointly worked out during the visit of Tokyo in November 2006 is considered to be unique not only in India but also in Japan. It is envisaged (more by the Japanese side) that after an experience of evolving the new curriculum over next few years the Institute faculty members, including the Japanese faculty members, would be able to write new text books as the joint collaborative work for several engineering disciplines.

- Several Japanese companies are already running their operations in India. The number of such companies is going to grow in very near future. Students trained in IIITDM Jabalpur by the curriculum being developed with an assistance with Japan will be not only useful for the Indian industry they will also be useful for Japanese industries working in India.

14. Target population/ groups

Young engineering students and faculty members/research staff of IIITDM Jabalpur

15. Detailed Action Plan (year wise):

## A. The Visits of Japanese Experts to Jabalpur for the Purpose of Teaching

Table 1 shows courses of the undergraduate curriculum at IIITDM Jabalpur which were identified for the Japanese assistance. The semester in which these courses are to be offered of the Four-year curriculum are also given

Table 1 Courses for which the Japanese side agreed to send Experts

No

S.No	Name of the Course	Semester
1.	Control Systems: Theory, Software and Hardware (I)	(5th)
2.	Micro-Nano Science and Engineering (I)	(5th)
3.	Advanced Manufacturing Processes & Technologies (I)	(7th)
4.	Energy and Supply Systems (I)	(7th)
5.	Electronic Devices: Theory & Applications (I)	(7th)
6.	Overview of Engineering Systems/ Engineering Literacy (II)	(2nd)
7.	Computer Graphics, Simulation & Visualization (II)	(4th)
8.	Computer Vision & Image Processing (II)	(6th)
9.	Mechatronics & Robotics (II)	(6th)
10.	Sensing: Methods, Devices and Applications (II)	(6th)
11.	Microelectronics (II)	(6th)
12.	Agile Computer Integrated Manufacturing (II)	(6th)
13.	Design & Evaluation of Production Systems (II)	(8th)
14.	VLSI: Design & Testing (II)	(8th)
15.	Business Models for Manufacturing (II)	(8th)

Based on the above Table, the year wise requirement of the Japanese experts at IIITDM Jabalpur during the proposed period of collaboration is given in Table II. Since 7th and 8th semester students will not be available in Semester I (August – November and Semester II (January to April) of the next academic year, the requirement is low during these semesters, i.e. 2 and 5 respectively. The requirement, however, stabilizes from Semester I, 2008-09. It then remains of 5 experts in Semester I and 10 experts in Semester II. This has been shown as a bar chart in Figure 1

	Sem I 2007-08	Sem II 2007-08	Sem I 2008-09	Sem II 2008-09	Sem I 2009-10	Sem II 2009-10	Sem I 2010-11	Sem II 2010-11	Sem I 2011-12	Sem II 2011-12
Courses Nos that would require Japanese Experts	1,2,	8, 9, 10, 11, 12	1, 2, 3. 4, 5	6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1, 2, 3. 4, 5	6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1, 2, 3. 4, 5	6, 7, 8, 9, 10, 11, 12, 13, 14, 15	1, 2, 3. 4, 5	6, 7, 8, 9, 10, 11, 12, 13, 14, 15
Total Nos of Japanese Experts	2	5	5	10	5	10	5	10	5	10

Academic Years & Semesters
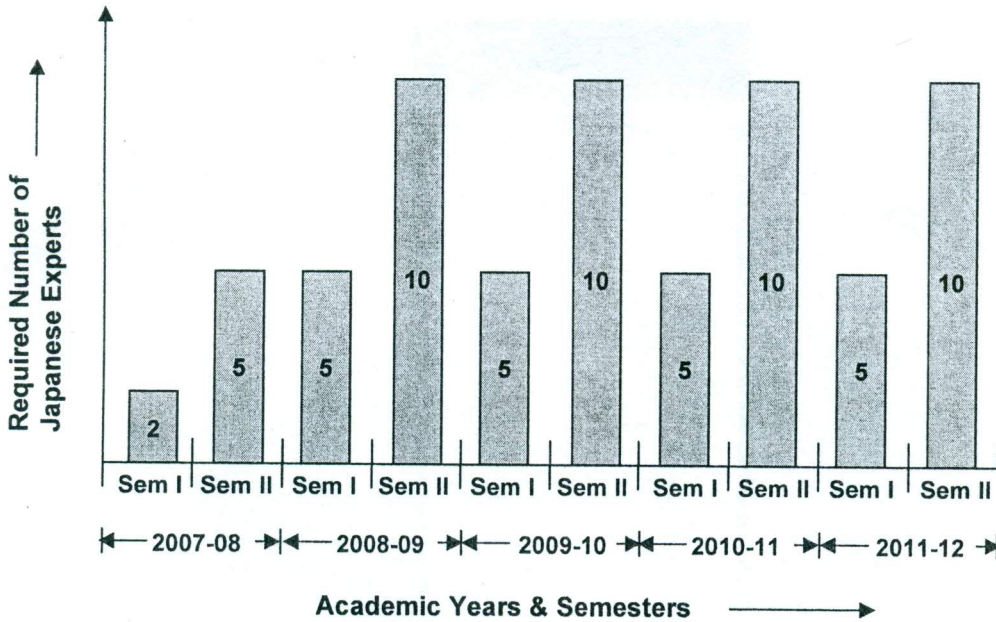
B. The Visit of IIITDMJ Faculty/Research Staff/Students to Japan

One of the objectives of the project is to expose the faculty members/research staff/students of IIITDM Jabalpur to the working culture in academic institutions, R&D Labs and industry of Japan. It is envisaged that through such an exposure they will be able to imbibe the key elements of working culture in Japan and will, in turn, get trained. Faculty Members/Research Staff will also be able to do a collaborative research work through such exposures. However, such visits shall normally be made during the Summer Term of the Institute, i.e. from the first week of May to the last week of July. The duration of such visits shall normally vary between 6 – 8 weeks. Students, on the other hand, will be sent for their summer internship.

Towards such an aim, the following schedule is envisaged for the visits of the faculty/research staff/students from the Indian side:
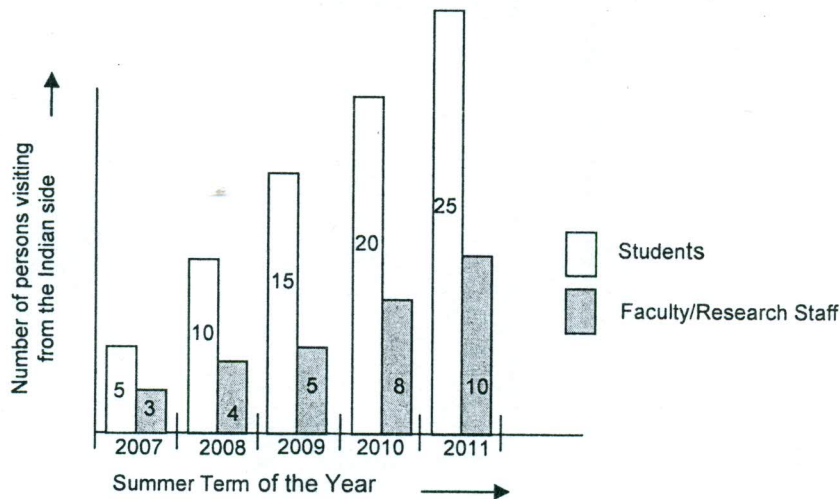
The number of visits made in a year, however, will depend on the available capacity of each host Japanese university/institute/industry.

C. Organization of Joint Conference/Seminar/Workshop

It is proposed to have one joint conference/seminar/workshop every year alternatively in Jabalpur and one of the consortium Japanese partners. Efforts would be made to ensure that the conferences attract a large participation from the Japanese as well as India industries. Each such conference will be widely publicized in Japan as well as in India. Conference proceedings shall also be published.

Normally, it takes about one year to organize a seminar. It is therefore proposed that the first joint conference is organized in 2008. There will thus be four joint-conferences during the project period one each in 2008, 2009, 2010 and 2011.

16. Quantitative and qualitative (verifiable) target indicators:

B Tech and M Tech students graduating from IIITDM Jabalpur during the period of collaboration will carry the imprint of Japan – India cooperation through out their life.

The same will be carried out by faculty members/research staff/students who visit Japan and carry out a joint research work during their stay.

Research papers/project reports other collaborative works will also be the indicators of the cooperation between the two countries.

17. Environmental sustainability of the project:

Not applicable.

18. Land acquisition/ resettlement and rehabilitation involved:

Land for building the campus of IIITDM Jabalpur has been given by the Govt of State of Madhya Pradesh. The construction work for the building of its campus has also begun. There are no issues involved regarding resettlement and rehabilitation.

19. Linkages with similar projects:

(i) Information regarding projects in similar areas undertaken previously (add evaluation reports, if any):

Not applicable

(ii) Does the project form part of the sectoral strategy/ umbrella project? If yes, who are the other partners with details of the specific activities being undertaken by them:

Not applicable

APPLICATION FORM FOR JAPAN'S DEVELOPMENT STUDY ROGRAM

Date of entry: Month .... **Year** ....

Applicant: **Government of India**

1. Project Digest

(1)   Project Title:

Nurturing and strengthening of PDPM Indian Institute of Information Technology, Design & Manufacturing, (IIITDM) Jabalpur by developing its Design Studios, i.e. R&D Laboratories, through Japan-India Collaboration

(2)   Location:

Jabalpur, Madhya Pradesh, India

(3)   Implementing Agency

PDPM Indian Institute of Information Technology, Design & Manufacturing (IIITDM) Jabalpur

(4)   Justification of the Project

Though the engineering education in India is well diversified and vast, the problem of producing a suitably trained engineering manpower, that has competence in handling Design and Manufacturing related problems through an integrated approach, still remains to be addressed. Ministry of Human Resource Development (MHRD), Government of India, is seized with this problem.

In order to fulfill the above gap, it has set up the PDPM Indian Institute of Information Technology, Design & Manufacturing (IIITDM) at Jabalpur. The institute is currently in its beginning stages. In order to fulfill its declared it has to set up its Design Studios which will serve as the hub of research and development in the areas of Design and Manufacturing.

(5)   Desirable & Scheduled time of the commencement of the Project:

January 2008 – December 2011

(6)   Expected funding source and/or assistance (including external origin) for the Project

Public and Private sector in Japan, Government of Japan

(7)   Other relevant projects, if any

(8)   Any relevant information of the project from gender perspective

No

2. Terms of Reference of the proposed Study/Project

(1)   Necessity/Justification of the Study/Project

The creation of IIITDM Jabalpur is expected to be a landmark decision in the history of technical education in India. The structure of its undergraduate curriculum of the Institute is unique because while on one hand it heavily emphasizes on the hands-on training of engineering students in a large number of its courses with the assistance of IT driven modern design and prototyping tools, it also emphasizes on subjects belonging to Humanities and Social Sciences (HSS) such as Civilization & Culture, Arts & Aesthetics, Economics, Professional Ethics etc. and subjects of

Management Science as part of its compulsory courses. Response of students as well as the industry towards such a curriculum is so far very enthusiastic.

(2)   Necessity/Justification of the Japanese Technical Cooperation

Activities pertaining to manpower development in the areas of Design and Manufacturing require important (a) global and (b) industrial partnerships. Global partnerships with universities and institutes that have already established themselves in these areas can play a key role for the growth and the development of the new Institute. Japanese universities, institutes, research labs and industry have made significant success in these new and upcoming areas pertaining to Design and Manufacturing.

(3)   Objectives of the Study

Research and Development activities of PDPM IIITDM Jabalpur will be primarily for generation and assimilation of new knowledge for developing problem solving tools and techniques, and efficient design methodologies.

Projects will be put in two broad categories: (i) sponsored projects and (ii) consultancy projects. Sponsored projects will be generally research projects of longer duration (2 to 5 years) requiring involvement of more than one faculty member. In many cases faculty members from consortium partners and scientist from the Research Labs/Industry could jointly take up the projects.

The consultancy projects, mainly problem solving type, will be of shorter duration and will generally be handled by an individual faculty member.

In order to foster a spirit of innovation in industry, Design Studios will be located within the institute. This park will house design studios of industrial houses. Industrial houses can groom these studios as idea factories for their future endeavors. This innovation and incubation facility will also use students, faculty members and the other the infrastructure of the institute and run it smoothly.

(4)   Areas to be covered by the Study/Project

The academic model of the institute emphasizes innovation as well as hands on experiments for students. This model of experimental learning will be implemented by providing a rich environment of facilities in Design Studios, which have been classified in four broad generic groups. A brief description of facilities that will be required along with the capital expenditure is described below.

The Institute is creating its infrastructure to give degrees in the disciplines of (a) Computer Science & Engineering [CSE], (b) Electronics & Communication Engineering [ECE] and (c) Mechanical Engineering [ME] both at the undergraduate as well as postgraduate level with focus on the aspects of Design and Manufacturing. It is expected that these programs will soon be extended to other disciplines such as Materials Engineering and Bio-Sciences & Engineering.

(5)   Scope of the Study

Research and Development activities of the institute carried out at its Design Studios will be primarily for generation and assimilation of new knowledge for (a) developing problem solving tools and techniques for efficient design methodologies, (b) generating appropriate database on materialsand processes which helps in transforming the finalized designs to lab/pilot/industrial scale manufacturing/fabrication.

Group I: Virtual Realization and Design

Concurrent and distributed engineering are challenging concepts for

reducing the time-to-market and increasing the competitiveness of new products in a global market. The main emphasis of this group's activities will be the continuous virtualization of visualization and realization of a given product in all its phases. This kind of approach requires integration of phases of the initial planning, design, testing and the manufacturing of a given product by the virtual realization. Projects aiming at the development of an integrated platform supporting all stages of the product realization cycle, including complexity management and digital mock-up, will thus be taken up.

Group II: Computer Integrated Manufacturing

Computer-aided manufacturing (CAM) requires automation where computers communicate work instructions directly and thus control the manufacturing machinery including bank of robotics, milling machines, lathes, welding machines, and other tools thus moving the product from machine to machine as each step in the manufacturing process is completed. Such systems allow easy, fast reprogramming from the computer, permitting quick implementation of design changes. The advanced systems, which are often integrated with computer-aided design systems, can also manage such tasks as parts ordering, scheduling, and tool replacement. The system development task thus includes penalization of the design to fit the raw material, ability to edit and ability to add manufacturing information and the verification of the data. These tasks require the development of mechanical prototyping, electronic proto typing and software prototyping technologies.

### Group III: Product Evaluation & Analysis

Materials selection and the environmental impact of manufacturing play a key role in the development of products. Products developed also require their structural and property evaluation. Ergonomic design, product safety, evaluation of properties thus remain key concerns in the area of manufacturing. This group would be addressing itself with these issues.

Group IV: Advanced Technologies

Microfibrication, nano-scale manufacturing, sensor development, wireless communication bio-engineering are the areas of advanced research that need to be taken up for understanding and developing futuristic manufacturing environment. This group will address the needs of such advanced technologies.

(6)   Study/Project Schedule

Project schedule for the 4 groups of activities is shown in the following figure:
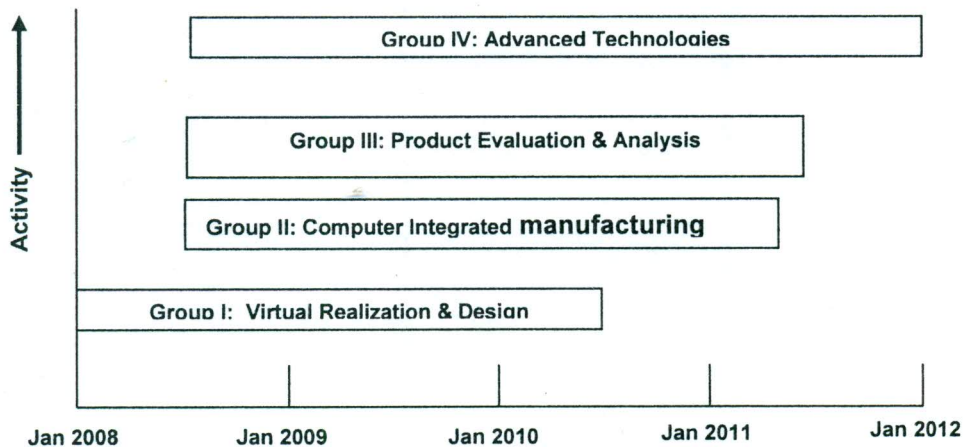
(7)   Expected Major Outputs of the Study →

Research and Development activities of the institute will be primarily for generation and assimilation of new knowledge for developing problem solving tools and techniques, and efficient design methodologies. These will be mostly industry-supported activities, while some may be supported by Central and State Governments or their agencies. Projects will be put in two broad categories: (i) sponsored projects and (ii) consultancy projects. Sponsored projects will be generally research projects of longer duration (2 to 5 years) requiring involvement of more than one faculty member. In many cases faculty from other institutions and scientist from the Research Labs could jointly take up the projects. The consultancy projects, mainly problem solving type, will be of shorter duration and will generally be handled by an individual faculty member.

(8)   Expected funding resources

The total expenditure on these laboratories would be about Rs.210 crores (Yen 5.25 billion) consisting of the building cost of Rs.25 crores (Yen 0.625 billion) and equipment cost of Rs.185 crores (Yen 4.625 billion).

(9)   Environmental and Social Considerations

Not applicable

(10)   Request of the Study to other donor agencies, if any:

No

(11)   Other relevant information

3. Facilities and Information for the Study

(1)   Assignment of counterpart personnel of the implementing agency for the Study

Director,

PDPM Indian Institute of Information Technology, Design & Manufacturing Jabalpur

Jabalpur, Madhya Pradesh

India

(2)   Available data, information, documents, maps etc. related to the Study/ Project

Maps of India & Jabalpur, A copy of Rules and Bye Laws of the Institute are enclosed

(3)   Information on the security conditions in the Study Area

4. Global Issues (Gender, Poverty, etc.)

Not applicable

BoG/2007-08: 1.14 – <u>Institute's Participation in the Center for Computational Mathematics Communication & Allied Technologies (COMCAT)</u>

The item for discussion shall be placed before the Board in the meeting itself.

BoG/2007-08: 1.15 – <u>Any other item with the permission of the Chair</u>

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY DESIGN & MANUFACTURING JABALPUR

MINUTES OF THE 2007-08/ 1st MEETING OF BOARD OF GOVERNORS HELD ON 11th May, 2007 AT 12.00 NOON

Venue - Conference Room (MHRD) Shastri Bhawan, New Delhi

Members Present:

1)	Shri. Sudeep Banerjee Advisor (Minister of HRD), MHRD, New Delhi	Chairman
2)	Shri. Ravi Mathur Joint Secretary (T), MHRD, New Delhi	Member
3)	Shri M Fakruddin Director (Corporate Planning & Marketing), HAL Corporate Office Bangalore – 5600 001	Member
4)	Prof. H P Dikshit Visiting Fellow, NBHM, PDPM-IIITDM, Jabalpur	Member
5)	Prof. Rajeev Sangal, Director, International Institute of InformationTechnology, Hyderabad	Member
6)	Prof. Sanjeev Bhargava Director, IIITDM Jabalpur	Member
7)	Prof. Aprajita Ojha Professor, IIITDM Jabalpur	Member
7)	Shri. S. C. Prusty Finance Officer & Officiating Registrar, IIITDM Jabalpur	Secretary

Members Absent:

1)	Prof. Sanjay G Dhande Director, IIT, Kanpur	Member
2)	Dr. Pawan Goenka President – Automotive Sector, Mahindra & Mahindra Ltd. Mumbai	Member
3)	Dr. Darlie O Koshi Executive Director, National Institute of Design, Ahemdabad	Member
4)	Dr. Manoj Gaur Managing Director, Jai Prakash Associates Ltd & Director, JIL Info Tech Ltd, New Delhi	Member
5)	Shri D S Mathur Secretary, Telecommunication, Govt of India, New Delhi	Member
7)	Prof. P Gupta Dept. Computer Science & Engineering, IIT Kanpur	Member

BOG/2007-08-1.01   Opening Remarks by the Chairman

The Chairman welcomed all the members and provided a brief remark about the present activities and future plans of the Institute to the members.

BOG/2007-08-1.02   Director's Overview Report

The Director presented a brief report on academic session 2006-07 in which special lectures by distinguished faculties from different institutions, Japanese experts and other Indian experts were organized by the Institute for the students for giving a real life exposure to them. The Director also appraised the board about the plan of rationalization of the hostel accommodation for the students in 2007-08. The board was also appraised by the Director about hosting of cultural festival by students in January, 2007. The Director informed the board about the participation of the students in Cognizance '07, technical festival of IIT, Roorkee, and the students who got awards/prizes.

The Board praised the above and suggested the director to facilitate more such activities in future.

BOG/2007-08-1.03   Ratification of the Minutes of the BOG/2006-07 3rd Meeting held on 3rd January, 2007

The minutes of the above meeting was circulated to the members earlier. The Board ratified the minutes of the BOG/2006-07 3rd Meeting held on 3rd January, 2007 unanimously with the modification that Prof Phalguni Gupta be also considered as a member of the Sub-Committee of the Board.

BOG/2007-08-1.04   Action Taken Report

Institute Logo

The board ratified the approval of the logo by the Chairman as designed by the Institute.

Starting of Ramanujan and Tagore Distinguished Lectures Series at the Institute

The board took note of such move by the Institute.

Formation of the Sub-Committee of the Board

The board took note of formation of the sub-Committee and suggested that the Committee should meet at regular intervals and look into the pace of execution of different decisions taken at the board level.

Capacity Expansion Requirements and Plans of the Institute

The board took note of the capacity expansion plan of the Institute which was communicated to the JS(T), MHRD.

Faculty Perks/Priviledges

The board took note of the action taken on faculty perks/priviledges.

Honorarium to the Wardens of the Institute

The board took note of the action taken on the above.

Moving Expenses of Individuals on Joining the Institute on Initial Appointment

The board took note of the action taken on the above.

Counting of Past Services from Government Institutions/Autonomous Body to IIITDM, Jabalpur

The board took note of the action taken on the above.

List of Experts as Nominees of the BOG for the Selection Committee

The board took note of the action taken on the above.

Institution of various Medals and Awards to be given to Undergraduate and Postgraduate Students of IIITDM, Jabalpur

The board took note of the action taken on the above.

Constituting a Panel of Architects for the Institute

The director informed the board about recent advertisement for empanelment of Architects for different works to be undertaken by the Institute. The board took note of the same.

BOG/2007-08-1.05   **Ratification of the approval accorded by the Chairman on the Annual Report of the Institute for the Period 2004-05 and 2005-06**

The board ratified the approval of the Annual Report for 2004-05 and 2005-06 and also suggested that the report should have been printed year wise as 2004-05 and 2005-06 instead of 2004-06. It was also suggested that a letter to that effect may be sent from the Institute to the ministry for correctly ratifying the same.

BOG/2007-08-1.06   **Ratification of the approval accorded by the Chairman on incurring Expenditures of the Institute in 2007-08**

The board ratified the approval of Chairman for incurring expenditure during 2007-08 in the absence of duly approved budget estimates from April, 2007 till date of the meeting.

BOG/2007-08-1.07   **Ratification of the approval accorded by the Chairman on Recommendations of the Selection Committee for the Faculty Positions**

The Director requested the Board to note the inadvertent omission of Prof Pravir Dutt in the list of experts of the Committee. The board ratified the approval accorded by the Chairman on the recommendations of the Selection Committee for the faculty positions.

BOG/2007-08-1.08   **Ratification of the Approval accorded by the Chairman on the recommendations of the Selection Committee for (a) Deputy Registrar and (b) Finance Officer of the Institute**

The board ratified the approval accorded by the Chairman on the recommendations of the Selection Committee for the position of (a) Deputy Registrar and (b) Finance Officer.

BOG/2007-08-1.09   **Recommendations of the Sub-Committee of the Board arrived at in its meeting held on February 12, 2007 and Action Taken by the Institute**

The board noted and ratified the action taken on different decisions by the sub-Committee meeting held on February 12, 2007. Prof. H. P. Dikshit suggested that the Institute Faculty Affairs Committee (IFAC) be termed as Institute Faculty Development and Welfare Committee (IFDWC) and should meet atleast once in every quarter.

BOG/2007-08-1.10   **Recommendations of the Building & Works Committee Meeting held on 10th May, 2007**

The Board noted the PERT chart of various Buildings & Works activities, including services. The Board also suggested linking the PERT chart with the financial flow statement so that the release of funds from the Ministry can be done more effectively. The board noted and ratified the decisions taken by the Building and works Committee meeting held on 10th May, 2007.

BOG/2007-08-1.11   **Recommendations of the Finance Committee Meeting held on 11th May, 2007**

The board noted and ratified the decisions taken by the Finance Committee meeting held on 11th May, 2007.

BOG/2007-08-1.12   **Status of the Undergraduate Curriculum of IIITDM, Jabalpur**

The Board noted the Curriculum suggested by the Curriculum Committee of the Institute. Prof. Rajiv Sangal, Director, IIIT, Hyderabad appreciated the Curriculum but suggested that more emphasis be given on research aspects. He suggested that Institute should decide its major thrust areas of research. In order to meet this goal he suggested that the flexibility in implementing the Curriculum be kept so as to ensure that students are able to register for an advanced course if required for carrying out research in the thrust area identified by the Institute.

The board suggested that the next meeting of the Curriculum Committee be held in Jabalpur so that the Committee members can also meet the Institute faculty.

The Chairman suggested that the Institute should also prepare a road map relating to the academic vision along with its Curriculum.

BOG/2007-08-1.13   **Status of the Indo-Japan Cooperation for IIITDM, Jabalpur**

The status report was presented by the Director. The Board expressed its satisfaction on the fact that the visit of Japanese experts to the Institute has been started. However, the future activities of the collaboration require more clarity and Institute should try to develop it at the earliest. The board also felt that efforts to initiate learning of Japanese Language by the students be done by the Institute at the earliest.

BOG/2007-08-1.14   **Institute's Participation in the Centre for Computational Mathematics Communication & Allied Technologies (COMCAT)**

The discussion on the item was deferred.

BOG/2007-08-1.15   Any other item with the permission of the Chair

There being no other item for discussion the meeting ended with a vote of thanks to the chair.

sd/
Director

sd/-
Secretary
Board of Governors

Approved

Sd/-
Chairman
(Board of Governors)