**INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, DESIGN AND MANUFACTURING, KANCHEEPURAM**

# MINUTES OF 43rd MEETING OF THE SENATE

**Date** : **19th September, 2020**
**Time** : **3.00 P.M.**
**Venue** : **Virtual through Google Meet**

**Members Present:**

1. *Prof. Banshidhar Majhi, Director & Chairman Senate*
2. *Mr. A. Chidambaram, Registrar & Secretary Senate*
3. *Dr. Binsu J Kailath, Dean, Academic*
4. *Prof. S. Narayanan*
5. *Prof. S. P. Venkateshan*
6. *Prof. Jagadeesh Kumar*
7. *Prof. Chandramouli Padmanabhan*
8. *Prof. Krishna Sivalingam*
9. *Dr. Venkatesh G*
10. *Dr. Sudhir Varadarajan*
11. *Dr. M. Sreekumar*
12. *Dr. Naveen Kumar Vats*
13. *Dr. M.D. Selvaraj*
14. *Dr. N. Sadagopan*
15. *Dr. Priyanka Kokil*
16. *Dr. B. Raja*
17. *Dr. Tapas Sil*
18. *Dr. S. Vijayakumar*

**Leave of Absence:**

1. *Dr. Anand Lakshmanan*

<table>
<tr><td rowspan="2">2020-43-Senate-01</td><td colspan="3">Welcome to the members and invitees by the Chairman.</td></tr>
<tr><td colspan="3">The Chairman extended warm welcome to all the members and wished them good health during this pandemic period.</td></tr>
<tr><td rowspan="3">2020-43-Senate-02</td><td colspan="3">To confirm the Minutes of the 42nd meeting of the Senate held on 03rd June 2020.</td></tr>
<tr><td colspan="3">The Minutes of 42nd meeting of the Senate held on 03rd June 2020 was circulated to all members. No comments/suggestions were received from the members.<br>Senate may kindly confirm the Minutes of the 42nd meeting placed as Annexure I.</td></tr>
<tr><td colspan="3">The Senate confirmed the Minutes of its 42nd meeting held on 03rd June 2020.</td></tr>
<tr><td rowspan="4">2020-43-Senate-03</td><td colspan="3">Report on Action Taken on the decision of 42nd meeting of the Senate held on 03rd June 2020.</td></tr>
<tr><td>2020-42-Senate-04:</td><td>New Elective Course</td><td>Introduction to Photonics, a new elective Course is offered from July 2020 semester.</td></tr>
<tr><td>2020-42-Senate-05:</td><td>Admission only to B.Tech. Programmes with an option to pursue Dual Degree Programme</td><td>To be effective from 2020-21 admission batch.</td></tr>
<tr><td>2020-42-Senate-06:</td><td>Student Intake for the year 2020-21</td><td>The institute proposed UG intake of 270 seats taking into hostel capacity. However, MoE insisted for</td></tr>
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| | | | enhancement of seats to accommodate the EWS reservation. Accordingly, a proposal was sent to revise the UG intake. A separate agenda on this matter is placed for kind consideration of senate. |
| | 2020-42-Senate-09: | Revised Academic Schedule and Activities for Even Semester (Jan-May) 2020. | Online Exams conducted for outgoing students and 1st / 2nd year students. Results were published and provisional certificate issued for the graduands. |
| | 2020-42-Senate-10: | Revised Academic Calendar for Jul-Nov 2020. | Revised Academic Calendar has been published in the website and also communicated to all the students. |
| | 2020-42-Senate-12: | Conduct of Supplementary Examinations of Final Year Students Online in case Students could not report to campus on 1st July | Exams were conducted in online and results published |
| | 2020-42-Senate-13: | Permission to issue Provisional Degree Certificates to the Students who complete the credit requirements by 31st July | Provisional degree certificates issued to all the students who have completed the academic requirements. |
| | ***The Senate noted the action taken by the Institute.***<br>***In the case of students intake for the year 2020-21, senate was informed that the proposed intake is under revision due to shortage of hostel accommodation and ministry has been requested in this regard. Accordingly, the senate was intimated that the revised intake as agreed by the ministry would be placed before the senate in its next meeting.*** | | |
| **2020-43-Senate-04** | **Design Spine Curriculum and Syllabus**.<br>IIITDM Kancheepuram thrust in creating design centric engineers offers 6 design courses to all branches of engineering. The BoG of the institute has recently constituted a subcommittee under the leadership of Prof. G. Venkatesh, Member-Senate and Mr. Krishna V Giri, Member, BoG to review and recommend suitable changes in the course curriculum. At the outset, the committee identified three objectives which are:<br>1) To clearly articulate demand from industry, products to be produced by IIITDM and their positioning.<br>2) To review and strengthen the design centric engineering curriculum in terms of the overall structure, the content of the design spine and its integration with the rest of the courses.<br>3) To recommend an appropriate organization and budget to strengthen the design spine and the future programs to expand the foot print and impact of IIITDM on the industry/society. | | |

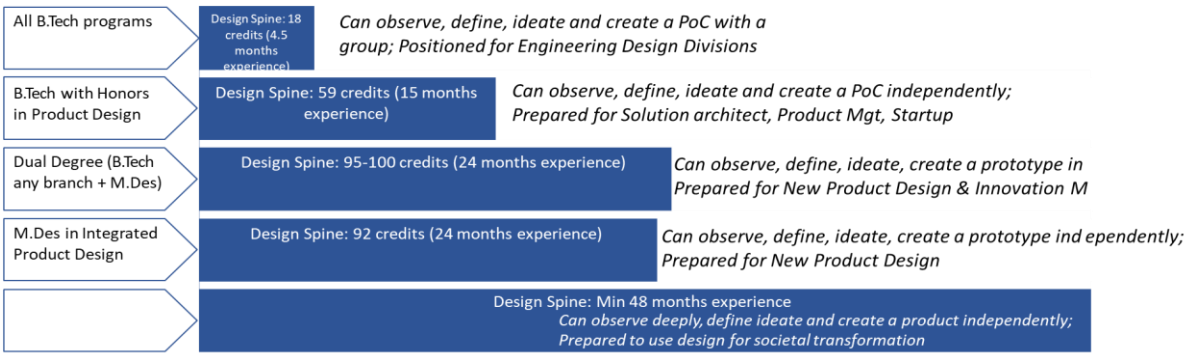
Keeping this objective in mind, the committee had due deliberation with various stakeholders and recommended to have 3 categories of offering by providing complete flexibility to the students to choose their electives/degrees.

a) *Design-centric engineers*: All engineers entering IIITDM will have a certain level of exposure to product design and digital that will differentiate them against engineering students coming from other institutions in terms of their problem-solving capability. They will receive the regular B.Tech degree. They may pursue their career aspirations in engineering – technology jobs, Masters programs in technology (India or abroad) or join PSUs. About 70-80% students may fall in this category.

b) *Design-centric engineers++*: Those who have an inclination for a career as solution architects, product designers, entrepreneurs or product managers will be taken into a separate stream and given an additional six electives (from the advanced M.Des courses) and supported through the internship. They will receive a B.Tech. in their program of study along with a Honors in Product Design. About 20-30% of students may fall in this category. A few from this group may opt for a 5-year Dual Degree program in B.Tech + M.Des. The products in this category will be the brand ambassadors of IIITDM.

c) *Product Designers*: These will be close to the type of products produced by the M.Des programs in NIDs and IDC/IITB. This product category does not exist in IIITDM portfolio today. About 20 students may be inducted in this program.

The product lines of above category is illustrated as under:




The curriculum has a Foundation program in the first semester to help the students to unlearn and rediscover their creative selves. Another 5 subjects in subsequent semesters ensures that students gain hands on experience in the process of product design right from need identification to PoC and business case development. Details of courses and its outcome are provided at Appendix 3 of the proposal placed as **Annexure 2**.

Students will be given an option to pursue honors in Product Design at the end of 5$^{th}$ Semester and a Dual Degree program in M. Des at the end of their 6th semester. However, they will have to go through an internal selection process that will be based on the potential and performance of the student in design spine. The emphasis on providing 25% weightage for problem-based learning in 30% of the science-engineering courses (between 1-6 semesters) will help the students gain practical skills in engineering design and manufacturing at the component level. Another key aspect of the proposed design curriculum is that it does not require major changes to the overall curriculum structure. By creating the

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| | two categories and making electives open it has created space to meet the requirements of different categories of students/products.<br><br>In case of Master of Design program, it is proposed to adopt elements from TU Delft's Integrated Product Design and IDC (IITB) industrial design. The students will start working on an industry provided or self-identified problem in their first semester. Each of the courses will facilitate students work on the same problem but from the perspective of the course so that a holistic appreciation of the concept and embodiment is achieved. The electives and detailed syllabus are under preparation and will be placed in next senate.<br><br>It is also proposed to commence inter disciplinary design doctoral program and this will be open to educators/ professional to reinvent their own practice or knowledge base.<br><br>It is proposed to implement Design Spine curriculum & syllabus for the UG program (Design-Engineer &Design-Engineer with Honors in Product Design) starting with 2020 batch. M.Des Program in Integrated Product Design will be offered from Jul 2021 after finalization electives and its syllabus and PhD Program in Interdisciplinary design and innovation may be offered from Dec 2020.<br><br>Senate may kindly consider and approve the Design spine curriculum proposed for UG courses and also the proposal of M. Des. and Inter disciplinary Ph.D. program. |
| | ***A presentation was made by Dr. Sudhir Varadarajan, Dean (Design, Innovation & Incubation) highlighting the salient features of the proposal.***<br><br>***The Senate noted the Design Spine proposed by the institute and appreciated the members of the team for their efforts. The Senate has thoroughly deliberated upon the different points in the proposal and urged recruiting faculty members with specialization in Design so that the implementation of Design Spine curriculum would be really effective. A group of committed faculty members working closely with Industry would be required to align the students towards Design Spine and Institute should provide all support for the same. It's important to have a strong Design school to ensure proper nurturing of the 20% of students who opt for Minor/Honours in Design. However, it should be ensured that the SIDI doesn't work in isolation. Senate also advised that, the students from Dept. of CSE should also be exposed to the design aspects relevant to User interface Design, etc. in addition to the common design courses. Senate has advised to defer the PhD programme by a year or two and start the M Des programme after strengthening the Design School with some more faculty members. As some of the existing faculty members are already aligned towards interdisciplinary design, it is expected that by 2022 when the 2020 batch students reach their fifth semester, the Design school would be strengthened so that guiding and aligning the 20% students towards Minor or Honours in Design should be possible. The discussion is summarized as follows:***<br><br>• ***Senate has given approval to introduce the new design spine for B Tech and Minor/Honours in product design from 2020 batch.***<br><br>• ***The curriculum and syllabus for the M Des program would be presented in the subsequent Senate meeting and based on the approval by the Senate, M Des may be started from 2021 July.***<br><br>• ***School of Interdisciplinary Design and Innovation may be formed by attracting the right faculty/expertise. Also, as existing faculty members who work in Inter*** |

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| | ***Disciplinary Programme (IDP) find perfect balance between core research and interdisciplinary design, it would be possible to strengthen the Design school by 2022.***<br>• ***The nature of the PhD program would be presented and discussed in subsequent senate meeting and the program would be offered based on approval from the Senate.*** |
| **2020-43-Senate-05** | **Creation of School of Interdisciplinary Design and Innovation**<br>The challenge to promote a new culture of learning that nurtures curiosity, create industry partnerships to create the demand and position the talent appropriately, and encourage student led product innovation calls for sustained and focused efforts by a group of full-time dedicated faculty.<br>Keeping this in mind, it is proposed to setup a School of Interdisciplinary Design and Innovation (SIDI) with four types of expertise – Interdisciplinary engineering design; Integration between Engineering and Product Design; Product Design and a Design and Innovation Lab. The School will have a Design Advisory Council, with 6-8 experts drawn from the academia and industry, to guide its activities.<br>It is estimated that a min of 15 faculty (and a maximum of 25) will be required to support 1170 UG students and 220 brand ambassadors (Design++, M.Des, PhD)..<br>SIDI is different from a department in the following ways:<br>*(a) It is strongly aligned with the institutional goal*:<br>• Advancing design and innovation in manufacturing sector<br>• It is focused on encouraging student led product innovation and not restricted to pursuit of knowledge in a discipline.<br>• It will shape the mind of all the UG students entering IIITDM over six semesters.<br>• As a strategic unit, it will be mapped to the role - Dean (Design, Innovation, Incubation)<br>*(b) It is a network with a few regular nodes and linkages with others*:<br>• Faculty recruitment & promotion (regular or visiting) will not be restricted to one discipline; contribution to design-industry is key<br>• There will be a greater proportion of visiting/adjunct/guest faculty compared to regular faculty (at least 1:1); remuneration for visiting/adjunct/guest faculty preferably as per IIT norms (Senate/BoG to guide)<br>• Faculty from other departments interested in embracing design will be co-opted into specific initiatives-joint guidance of Interdisciplinary research / industry projects / incubation – quid pro quo; Similarly, Design Faculty can be included in Design Project Review committees in Departments; Common Faculty orientation sessions with design experts.<br>• SIDI will explore opportunities to channel technology innovations of departments into products<br>*(c) Its faculty will play the role of an enabler to ensure product-market fit*:<br>• Creating a learning environment<br>• Work with industry to position students (D++, M. Des.) |

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| | • Active role in product innovation & incubation<br><br>*(d) SIDI is also different from a research Centre:*<br>• Its activities include education, award of degrees (under institute name), research, consultancy, product innovation<br>• It has full-time faculty, recruitment & budget and its own outreach and have a goal of-the-self-sustenance in future.<br><br>The benefits to the faculty joining SIDI include:<br><br>• An opportunity to reinvent themselves (driven by a deeper appreciation of design),pursue industry oriented and inter-disciplinary work and enable student-led product innovation and startups<br>• All IIITDM rules applicable to faculty - # of PhDs, CPDA, etc. will remain same<br>• Faculty can apply for sponsored research in interdisciplinary/product development areas.<br>• The institute is having adequate sanctioned strength and faculty requirement will be met from existing as well as future requirement.<br><br>**Senate may kindly consider and approve the creation of separate School of Inter-Disciplinary Design and Innovation**. |
| | ***The Senate after deliberation approved the proposal of creation of School of Interdisciplinary Design and Innovation.*** |
| **2020-43-Senate-06** | **Ph. D. Defense Completion**<br>Defense meeting of Mr. K. Balaji, Ph.D. scholar was conducted through online mode on 24th July 2020 with the due approval of the Senate. The details of Scholar and list of publications are as under: |

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| **Name of the Scholar** | Mr. K. Balaji |
| Roll No. | MDM11D001 |
| Department | Mechanical Engineering |
| Guide (s) | Dr. SHAHUL HAMID KHAN, Assistant Professor |
| **Thesis Title** | Kinematic Analysis of RS type Parallel Robotic Mechanisms – A Performance Index Based Approach |
| Date of Joining | 03/01/2011 |
| Date of clearing Comprehensive Examination | 12/6/2012 |
| Date of Synopsis meeting | 5/12/2020 |
| Date of Ph D viva-voce examination | 24/07/2020 at 11AM by Google meet |
| Date of submission of final thesis | 31/07/2020 |
| Date of receipt of report from Indian Examiner | Dr.-Ing. M. Duraiselvam, B.E., M.E., M.B.A., Ph. D<br>Professor, Department of Production Engineering &<br>Dean (Planning and Development)<br>National Institute of Technology Tiruchirappalli<br>Reports Received on: 17.05.2020 |

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| Date of receipt of report from foreign Examiner | Prof. J. Paulo Davim – Aveiro (Portugal)<br>Reports Received on: 15.06.2020 |
| **Doctoral Committee** | |
| Chairman | Dr.S.Jayavel, IIITDM Kancheepuram |
| Member | Dr.T.Asokan, IIT Madras |
| Member | Dr. Tapas sil, IIITDM Kancheepuram |
| Member 3 | Dr.P.Pandithevan, IIITDM Kancheepuram |
| | |
| Internal Examiner for the Defence meeting | Dr. Jayabal K, , IIITDM Kancheepuram |

**LIST OF PAPERS BASED ON THESIS**

**CONFERENCE LIST:**

- Balaji.K., SreeKumar.M.,(2017) "Performance Evaluations of 3DOF RS type Parallel Mechanisms using kinematic parameter",International conference on Automotive system, Agricultural equipment and Manufacturing (ICAAM17),kalasalingamuniversity,Vol. 1 No.1 pp28.
- Balaji.K., SreeKumar.M.,ShahulhamidKhan.B.,(2017) "Kinematic analysis and Performance evaluation of novel 3- DoF RS type parallel mechanisms - Swarm Intelligence Approach ",International Conference on Mathematical Computer Engineering -(ICMCE2017),VIT, Chennai Campus.
- Balaji.K., ShahulhamidKhan.B.,(2017) "Kinematic Analysis and Performance Evaluation of Novel PRS Parallel Mechanism ",International Conference on Advances in Materials & Manufacture Applications(IConamma17), Amrita Vishwa Vidyapeetham, Bengaluru Campus.
- Balaji.K.,SreeKumar.M., ShahulhamidKhan.B.,(2018) "Multi Objective optimization based Performance evaluation of novel 3 DoF RS type parallel Mechanisms-NSGA-II approach",International Conference on Contemporary Design and Analysis of Manufacturing and Industrial Engineering Systems (CDAMIES18),NIT-TRICHY, Trichirapalli.(best paper for Oral Presentation)

**JOURNAL LIST:**

- Balaji.K., SreeKumar. M,Shahul Hamid Khan.B., "Kinematic Analysis and Performance Indices based Singularity Identifications of Novel 6 DoF RS type Parallel Mechanisms", Sadhana,Springer Publications.(under review).
- Balaji.K., Shahul Hamid Khan.B.,(2017) "Kinematic Analysis and Performance Evaluation of Novel PRS Parallel Mechanism ",IOP Conf. Series: Materials Science and Engineering, vol.310 issue(1) (2018).
- Balaji.K., Shahul Hamid Khan.B.,(2018) "Kinematic Analysis of Novel 3-RRS Parallel Mechanism ",International Journal of Science and Research, vol.7 issue(1) .

The Senate may kindly approve for award of Doctoral Degree and for issuing of provisional certificate to Sh. K Balaji.

***The Senate took note of the defense conducted by online. The Senate further approved for awarding Doctoral Degree and issuing of provisional certificate to Sh. K Balaji***.

**2020-43-Senate-07**

**Convening of 8th Convocation of the institute**

It is proposed to conduct the 8th Convocation of the Institute on 31st October 2020 at 10:30 am. Due to pandemic, it is planned to conduct in online mode. The institute has panelled few dignitaries and eminent personalities for Chief Guest on the occasion and is sending invitation in sequence. As soon as the Chief Guest is finalised, it will be circulated to all the members.

The list of graduands who are eligible to receive the degrees along with those who are eligible for Honours and Distinction are given in **Annexure 3**. A total of 303 students will be awarded degrees in the convocation.

The Senate may kindly approve the list of Graduands and permit convening of convocation of the Institute.

***The Chairman, Senate has informed that Dr Kasturirangan has kindly consented to be the Chief Guest for the convocation which will be held online. Mr. Arun Jain, CEO and MD, Intellect Design Arena, Chennai will join as the Guest of Honour. Senate has granted approval for the list of Graduands, as placed before the Senate, for awarding the graduands in the convocation ceremony scheduled on 31st October 2020 at 10.30 am.***

**2020-43-Senate-08**

**To discuss and approve the list of Prize winners in the 8th Convocation**

Senate in its 37th meeting held on 30th June 2018 has accorded approval for awarding various Prizes during Convocation for the graduating batch.

In line with approval of senate, a committee, comprising Deans and HoDs, has recommended the list of prize winners taking into account their excellence in various academic and co-curricular activities and the same is given below:

**List of Institute medal winners**

| Roll No | Student Name | CGPA | Prize | Criteria |
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| CED15I029 | PRATHAMESH A DEGWEKAR | 9.16 | Institute Gold Medal for the All Rounder of the Graduating batch | All Rounder of the Graduating Batch (BTech /DD/ MTech / PhD) |
| MDM16B038 | Y ADITYA VARMA | 9.73 | Institute Gold Medal for the Best Graduate across B Tech | Highest CGPA from COE, EDM, MDM, MSM |
| CED15I014 | VIDHATHRI | 9.47 | Institute Gold Medal for the Best Post Graduate across Dual Degree | Highest CGPA from CED, ESD, EVD, MFD, MPD |
| CDS18M003 | GOWRI MURALEEDHARAN B | 10 | Institute Gold Medal for the Best Post Graduate across M Tech | Highest CGPA from CDS, EDS, MDS. SMT |
| COE16B018 | HARINI R | 9.68 | Institute Medal for the Best Graduate in B Tech COE, Dept. of CSE | Highest CGPA from COE |
| EDM16B016 | K BHARATI | 9.27 | Institute Medal for the Best Graduate in B Tech EDM, Dept. of ECE | Highest CGPA from EDM |
| MDM16B038 | Y ADITYA VARMA | 9.73 | Institute Medal for the Best Graduate in B Tech MDM, Dept. of MEC | Highest CGPA from MDM |
| MSM16B015 | KARAMBOR CHAKRAVARTY SRIYA | 9.22 | Institute Medal for the Best Graduate in B Tech MSM, | Highest CGPA from MSM |

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| | | | Dept. of ECE | |
| CED15I014 | VIDHATHRI | 9.47 | Institute Medal for the Best Dual Degree Graduate from CED, Dept. of CSE | Highest CGPA from CED |
| ESD15I010 | S PRANAV KUMAR | 9.28 | Institute Medal for the Best Dual Degree Graduate from ESD, Dept. of ECE | Highest CGPA from ESD |
| EVD15I007 | F KIRAN ROBERT | 9.44 | Institute Medal for the Best Dual Degree Graduate from EVD, Dept. of ECE | Highest CGPA from EVD |
| MFD15I004 | POTNURU HEMA PRANEETHA NAIDU | 9.00 | Institute Medal for the Best Dual Degree Graduate from MFD, Dept. of ME | Highest CGPA from MFD |
| MPD15I019 | RATNANJALI TIWARI | 9.31 | Institute Medal for the Best Dual Degree Graduate from MPD, Dept. of ME | Highest CGPA from MPD |
| CDS18M003 | GOWRI MURALEEDHARAN B | 10 | Institute Medal for the Best Post Graduate from CDS, Dept. of ECE | Highest CGPA from CDS |
| EDS18M013 | ARTHI R | 9.89 | Institute Medal for the Best Post Graduate from EDS, Dept. of ECE | Highest CGPA from EDS |
| MDS18M002 | BHAVSAR DIVYAKUMAR ASHIT | 9.75 | Institute Medal for the Best Post Graduate from MDS, Dept. of ME | Highest CGPA from MDS |
| SMT18M007 | VISHAK P M | 9.89 | Institute Medal for the Best Post Graduate from SMT, Dept. of ME | Highest CGPA from SMT |

## BEST PROJECT AWARDS

| Roll No | Name | Award |
|---|---|---|
| MDM16B025 | RAHUL NARASIMHAN R | Institute Gold Medal for best IDP across all B Tech |
| MPD15I014 | ARAVIND C B | Institute Gold Medal for best IDP across all Dual Degree |
| SMT18M007 | VISHAK P M | Institute Gold Medal for best IDP across all M Tech |
| COE16B003 | ARUN NARAYANAN H | Institute Silver Medal for Best Project, B Tech COE |
| EDM16B008 | GATRAM MANOJ VENKATA SAI | Institute Silver Medal for Best Project, B Tech EDM |
| MDM16B038 | Y ADITYA VARMA | Institute Silver Medal for Best Project, B Tech MDM |
| MSM16B034 | SIDDHANT KARMARKAR | Institute Silver Medal for Best Project, B Tech MSM |
| CED15I043 | EASHAN DASH | Institute Silver Medal for Best Project, DD CED |
| ESD15I020 | S SANJANA | Institute Silver Medal for Best Project, DD ESD |
| EVD15I007 | F KIRAN ROBERT | Institute Silver Medal for Best Project, DD EVD |

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| MFD15I010 | PARTH LAL | Institute Silver Medal for Best Project, DD MFD |
| MPD15I019 | RATNANJALI TIWARI | Institute Silver Medal for Best Project, DD MPD |
| CDS18M003 | GOWRI MURALEEDHARAN B | Institute Silver Medal for Best Project, M Tech CDS |
| EDS18M004 | SOWMIYA S | Institute Silver Medal for Best Project, M Tech EDS |
| MDS18M005 | KETAN VINAYAK WARGHAT | Institute Silver Medal for Best Project, M Tech MDS |
| SMT18M003 | SHASHWAT PANDEY | Institute Silver Medal for Best Project, M Tech SMT |

The Senate may kindly approve the list of Medal Winners.

***The Senate has approved the list of prize winners, as placed before the Senate, for distributing the prizes in the convocation ceremony scheduled on 31st October 2020.***

**2020-43-Senate-09**

**New Elective Course**

The course titled "*Introductory Quantum Science for Engineers"* has been proposed by Dr. Tapas Sil after approval from the DAC.

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| Course Title | Introductory Quantum Science for Engineers | Course No | PHY5XXX |
| Specialization | Physics | Structure (LTPC) | 3 0 0 3 |
| To be offered for | UG/PG: students from branches | Status | Core ☐ Elective ▬ |
| Faculty Proposing the course | Dr Tapas Sil | Type | New ▬ Modification ☐ |
| Date of DAC | 09/07/2020 | Members Present in DAC | Dr. Naveen Kumar Vats<br>Dr. Vivek Kumar<br>Dr. JayachandraBingi<br>Dr. A. P. Khandale |
| | | External Member: | Prof. Sibasish Ghosh, IMSC, Chennai |
| Pre-requisite | CoT | Submitted for approval | 43rd Senate |
| Learning Objectives | • To develop in the student, an awareness of situations in engineering, which need ideas of quantum mechanics.<br>• The course emphasizes conceptual understanding rather than a heavily mathematical approach, but some amount of mathematics is essential for understanding and using quantum mechanics.<br>• To make the student understand the basic language and methods of quantum mechanics. | | |

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| | | • To enable the student with those aspects of quantum mechanics, which are necessary to begin to deal with microscopic systems. |
| | Learning Outcomes | Students will be able to<br>• understand the fundamental concepts and quantum mechanical processes in the nature.<br>• apply principles of quantum mechanics to calculate observables on known wave functions or potentials.<br>• pursue more advanced courses such as quantum optics, quantum computation, nanophotonic devices etc. |
| | Contents of the course *(With approximate break-up of hours)* | **Introduction to quantum mechanics**<br>How quantum mechanics is important in the everyday world, the bizarre aspects and continuing evolution of quantum mechanics, and how we need it for engineering much of modern technology. Blackbody radiation, The photo-electric effect, Atomic spectra, The Frank-Hertz experiment, Compton effect, Wave-Particle duality, Wave functions, Expectation values, Uncertainty principle. [12]<br>**Schrodinger's wave equation**<br>Getting to Schrodinger's wave equation. Solution of stationary-state Schrodinger equation for one dimensional problem – particle in a box, square-well potential, linear harmonic oscillator. Potential barrier and tunneling and applications such as, Esaki diode, scanning tunneling microscope, vibrational modes of ammonia molecule, etc.<br>3D isotropic quantum harmonic oscillator, Particle in 3D box and related examples (quantum dot, quantum wire etc.) [18]<br>**Aspects of spin**<br>Angular momentum operators. Stern-Gerlach experiment—spin. Solution of hydrogen atom problem. [8]<br>**Introduction to few advanced concepts**<br>Entanglement, EPR paradox, Bells inequality [4] |
| | Text Books | 1. David J. Griffiths and Darrell F.Schroeter," Introduction to quantum mechanics", (Cambridge University Press India, 3rd edition, 2019) |
| | Reference Books | 1. D. A. B. Miller, "Quantum Mechanics for Scientists and Engineers," (Cambridge University Press, 2008)"<br>2. R. Shankar, "Principles of Quantum Mechanics", (Springer, 2012) |
| | Senate may kindly consider and offer suggestions. | |
| | ***The Senate, after deliberation, approved the course titled "Introductory Quantum Science for Engineers" as new Elective Course.*** | |
| **2020-43-Senate-10** | **Institute Challenge Project**<br>The motto of the institute is "*Learning by Doing*" and the students are carrying out various project works throughout their academic duration.<br>However, in order to motivate the students, it is proposed to announce an award for inter disciplinary challenging projects every year. Institute will invite nominations for set of projects from group of students preferably inter disciplinary. A committee comprising Deans and HoDs would select 3 projects from set of nominations and the cost incurred for the project work be funded by the institute. Among the three projects, the best one will be | |

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| | selected by formulating suitable criteria and the winner will be awarded a suitable cash prize along with citation.<br>Senate may kindly consider the proposal and offer suitable suggestions. |
| | ***The Senate appreciated and approved the proposal of Institute Challenge Project. The Senate further advised the institute to explore the possibility for getting sponsorship from industry.*** |
| **2020-43-Senate-11** | **Academic Calendar for first year PG students for the semester Jul-Nov 2020**<br>In the Academic Calendar approved by the 42nd Senate, the commencement of Odd Semester has been from 3rd August 2020 for the existing batch of students.<br>In the case of first year PG students, the CCMT special round results were announced on 7th September and an orientation programme was held on 8th. Therefore, the classes for them (Odd Semester) has been commenced from Wednesday, 9th September 2020 and accordingly a revised Academic Calendar is placed as **Annexure 4**.<br>Senate may kindly approve the revised Academic Calendar for first year PG students**.** |
| | ***The Senate perused the Academic Calendar and offered following suggestions.***<br>• ***It's important to maintain a constant learning pace for the students***<br>• ***Classes should be engaged by the faculty members rather than sending the recorded lectures***<br>• ***Online classes being a new phenomenon, both the students and faculty members should be comfortable in all aspects***<br>• ***Contents covered in the class may slightly be reduced as the classes will be held for 12 weeks.***<br>• ***Classes should be taken on Saturdays also, even though it is mentioned as Special classes in the Calendar.***<br>***The Senate further approved the academic calendar as placed before the Senate.*** |
| **2020-43-Senate-12** | **Student Intake for the year 2020-21**<br>In the 42nd Senate, the senate approved the intake of 270 students which was based on available hostel capacity. Subsequently, the institute received a direction from ministry for enhancing the intake capacity to accommodate the EWS reservation. Due to this, the intake capacity has been enhanced to 375 including DASA students. The details are as under: |

| **Degree** | **Programme** | **No of Seats** | | **Total Seats** | |
|---|---|---|---|---|---|
| | | **JEE/ GATE** | **DASA** | | |
| **B. Tech.** | Computer Science and Engineering | 120 | 5 | 125 | **360 + 15 = 375** |
| | Electronics and Communication Engineering | 120 | 5 | 125 | |
| | Mechanical Engineering | 80 | 3 | 83 | |
| | Smart Manufacturing | 40 | 2 | 42 | |
| **M.Tech.** | M Tech in ECE with Spl. in Communication Systems Design | 20 | 1 | 21 | **84** |

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|---|---|---|---|---|---|
| | M Tech in ECE with Spl. in Electronics Systems Design | 20 | 1 | 21 | |
| | M Tech in MEC with Spl. in Mechanical Systems Design | 20 | 1 | 21 | |
| | M Tech in MEC with Spl. in Smart Manufacturing | 20 | 1 | 21 | |

The Senate may kindly approve the revised intake.

***The Senate approved the intake strengths for B.Tech. and M.Tech as proposed.***

**2020-43-Senate-13**

**List of students Provisionally Awarded Degree**

For the passing out students, Institute has conducted their January semester examinations in June followed by Supplementary Examinations in July through online mode. Based on approval of the Senate, the students who have completed the academic requirements as on 31.07.2020 have been issued provisional degree certificate and list of those students are placed as **Annexure 3**.

There are 298 graduands eligible for award of their respective degrees.

| Degree | Batch | Programme | Completed | Incomplete | Total |
|---|---|---|---|---|---|
| **B. Tech** | 2016 | COE | 40 | 0 | 40 |
| | 2016 | EDM | 39 | 0 | 39 |
| | 2016 | MDM | 35 | 2 | 37 |
| | 2016 | MSM | 31 | 0 | 31 |
| **B. Tech and M. Tech** | 2015 | CED | 40 | 0 | 40 |
| | 2015 | ESD | 18 | 1 | 19 |
| | 2015 | EVD | 19 | 1 | 20 |
| | 2015 | MFD | 18 | 0 | 18 |
| | 2015 | MPD | 17 | 0 | 17 |
| **M. Tech** | 2018 | CDS | 9 | 1 | 9 |
| | 2018 | EDS | 9 | 0 | 9 |
| | 2018 | MDS | 11 | 1 | 12 |
| | 2018 | SMT | 12 | 0 | 12 |
| **Total Students** | | | **298** | **6** | **304** |

Senate may kindly take note of issuance of Provisional Degree Certificates to the students who completed the credit requirements by 31st July 2020.

***The Senate noted the list of students awarded provisional degree.***

**2020-43-Senate-14**

**Award of Provisional Degree to Mr. BOORGULA KESHAVA, EDM16B005 who has completed the academic requirements in August 2020.**

In the last meeting of the Senate, the senate approved for awarding degree to students who have completed all the academic requirement by July 2020.

Subsequent to this, a request was received from Mr. BOORGULA KESHAVA, EDM16B005 of the graduating batch 2020 for award of provisional degree as he has secured a seat in IIEST Shibpur through CCMT Counselling.

He was having one pending course of his fourth semester and the exam for the course was conducted on 20th August. The student informed that he could not complete the course earlier due to family issues.

Taking into account successful completion of one pending course and also considering his

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| | future avenues, he has been awarded the provisional certificate as special case with the due approval of Chairman Senate.<br><br>Senate may kindly ratify the issue of provisional Degree Certificate to Mr. BOORGULA KESHAVA, EDM16B005 who completed the academic requirements by August 2020. |
| | ***The Senate ratified the decision of the Chairman, Senate for awarding Provisional Degree to Mr. BOORGULA KESHAVA, EDM16B005 who has completed the academic requirements in August 2020.*** |
| **2020-43-Senate-15** | **Consideration of NPTEL courses for Jan-Apr 2020**.<br><br>In the 42nd meeting of the senate, the senate directed that students who have registered for the NPTEL courses should attend the exams scheduled by NPTEL. In case any student is not able to give the NPTEL exam due to genuine reasons, exams may be conducted and in such cases, 50% weightage each may be given to assignment and exams.<br><br>However, subsequent to decision of the senate, the exams were not conducted by the NPTEL and NPTEL vide its letter dated 07.06.2020 that NPTEL will provide attested assignment score sheets and modified pass certificate based on average assignment score to the students from Jan-May 2020 semester. NPTEL has further requested all Institutes/Universities to accept the above documents for transferring credit to the student as a special case for the COVID-curtailed Jan 2020 semester. NPTEL also has mentioned that Institute are free to conduct the exams if they so desire.<br><br>Taking into account the pandemic and request of the students to issue course completion certificate for their higher education/placement, with the due approval of the Chairman Senate, the results have been declared based on the modified pass certificates and assignment score card.<br><br>Senate may kindly consider ratifying the decision of the Chairman of the Senate. |
| | ***The Senate ratified the decision of the Chairman, Senate for declaration of results based on modified pass certificates and assignment score card in case NPTEL courses.*** |
| **2020-43-Senate-16** | **General Guidelines: Admission, Performance and Time Schedule for Ph.D. Scholars.**<br>***A proposal of Regulations and Guidelines for timely assessment of performance of Ph.D. scholar was placed before the Senate for its consideration and approval.***<br>***The Senate, after careful perusal of the proposal, advised the institute to constitute a committee to look into the proposed guidelines and add few more if any. The Senate further advised that the committee may interact with faculty; evaluate the procedures followed by other institutions. The proposal may be placed in the next meeting, along with the report of the committee, for further considerations.*** |
| **2020-43-Senate-17** | **Seeking Senate advice in scheduling of 1st and 2nd Semester Classes of 2020 admission B.Tech. batch**<br>• Classes to commence from 23rd November 2020 up to 22nd February 2021.<br>• All Saturdays working days with 6 days for Quiz 1 & Quiz 2 (70 instructional +6 days).<br>• 7 days given for End Semester Examination.<br>• Same schedule for 2nd Semester from 29th March to 29th June.<br>• 2 weeks' vacation after each semester |

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| | • 3rd Semester to begin from 26th July 2021 along with other semesters |
| | ***The Senate has granted approval for the proposal and advised to modify if required as per any specific guidelines issued the MoE in future for the 1st year students.***<br>***The Academic Calendar prepared as per the proposal is attached as Annexure 5.*** |

The next meeting of the Senate will be held in **December 2020.**

**Shri. A. Chidambarm**
**Secretary**

**Dr. Binsu J Kailath**
**Dean (Academics)**

**Prof. B. Majhi**
**Director and Chairman Senate**

Annexure - 1

# INDIAN INSTITUTE OF INFORMATION TECHNOLOGY DESIGN AND MANUFACTURING, KANCHEEPURAM CHENNAI – 600 127

## MINUTES

## 42nd MEETING OF THE SENATE

held on

03rd June 2020 (Wednesday) at 10.30 AM.

**Through Google Meet**

# MINUTES OF 42ND MEETING OF THE SENATE

**Date** : **03, June 2020**
**Time** : **10.30 A.M.**
**Through Online** : **https://meet.google.com/hkq-erwq-bpw**

| **Members Present:** | **Leave of Absence:** |
|---|---|
| 1. *Prof. Banshidhar Majhi, Director & Chairman Senate*<br>2. *Mr. A. Chidambaram, Registrar & Secretary Senate*<br>3. *Dr. Binsu J Kailath, Dean, Academic*<br>4. *Prof. S. Narayanan*<br>5. *Prof. S. P. Venkateshan*<br>6. *Prof. Chandramouli Padmanabhan*<br>7. *Prof. Krishna Sivalingam*<br>8. *Dr. Anand Lakshmanan*<br>9. *Dr. Venkatesh G*<br>10. *Dr. Sudhir Varadarajan*<br>11. *Dr. M. Sreekumar*<br>12. *Dr. Naveen Kumar Vats*<br>13. *Dr. M.D. Selvaraj*<br>14. *Dr. N. Sadagopan*<br>15. *Dr. Priyanka Kokil*<br>16. *Dr. B. Raja*<br>17. *Dr. Tapas Sil*<br>18. *Dr. S. Vijayakumar*<br>19. *Mr. R. Gunasekaran, Invitee*<br>20. *Mr. G. Ravikumar, Invitee* | 1. *Prof. Jagadeesh Kumar* |

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| **2020-42-Senate-01:** | **Welcoming the members and invitees by the Chairman.** | | |
| | ***The Chairman greeted all the members and invitees with a warm welcome and wished them good health during this pandemic.*** | | |
| **2020-42-Senate-02:** | **To confirm the minutes of the 41st meeting of the Senate held on 01st February 2020.** | | |
| | The Minutes of 41st Meeting of the Senate held on 01 February 2020 was circulated to all members through mails. No comments/suggestions have been received from the members.<br><br>Senate may kindly confirm the Minutes of the 41st meeting of the Senate duly approved by the Chairman of the Senate.<br>**Annexure - 1** | | |
| | ***The Senate confirmed the Minutes of the 41st meeting held on 01st February 2020.*** | | |
| **2020-42-Senate-03:** | **Report on Action Taken on the decision of 41st meeting of the Senate held on 01st February 2020.** | | |
| | 2020-41-Senate-06: | Python Course for all students admitted in 2019 as elective / free elective. | In future, the course will be offered by Institute faculty. |

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| | 2020-41-Senate-07: | Revised B. Tech. Curriculum | To be effective from 2021 batch |
| | 2020-41-Senate-08: | Change of credits for students admitted into Direct Ph.D. Programme at IITM | To be effective for subsequent batches also |
| | 2020-41-Senate-12: | Modification in Selection Procedure for External Ph. D.: | To be effective from subsequent semesters |
| | 2020-41-Senate-13: | Cut off Marks for Honours Students in NPTEL Courses | NPTEL courses will not be considered for Honours |
| | 2020-41-Senate-14: | To modify the Ph. D. ordinance of the Institute R. 9 – Doctoral Committee | To be effective from next batch |
| | 2020-41-Senate-15: | Proposal to start new M Tech and M Des programme from July 2020 | It is proposed to commence the program from next academic year as it will be difficult to maintain social distancing with higher student strength. |

***While discussing the Action Taken Report, it was informed to the Senate regarding item No. 2020-41-Senate-06 that it may not be possible to offer the programming courses by the Department faculty members with the existing faculty strength. As soon as, more faculty members join the Institute, programming courses could be offered by the Department faculty members. However, students will be advised to take online Python course in 2nd Semester till such time.***

***With respect to item No. 2020-41-Senate-07, the Senate was requested to grant permission to revise the B. Tech. curriculum from 2021 batch as some more discussions are required on Design Courses, 1st year lab contents and Department level courses which may not be feasible in the existing situation due to the pandemic. The Registrar has informed the Senate the BoG has advised to constitute a Committee headed by Prof. G Venkatesh, Member, Senate to advise the Institute on Design courses and Design Curriculum. The Committee should have Prof. Krishna V Giri, Member, BoG, Faculty Members from the Dept. of Engineering Design, IIT Madras and other Design Experts from Academia and Industry as members.***

***Such a Committee will be formed within two months and the discussion on curriculum will be initiated.***

***While referring to 2020-41- Senate-15, it was informed to the Senate that the M. Tech. and M. Tech. (Res) programmes are required to be deferred for a year so as to ensure social distancing in academic and hostel blocks as required by the preventive measures against the pandemic.***

**2020-42-Senate-04:**

**New Elective Course**

The course titled Introduction to Photonics is proposed by Prof. Srijith K after approval from the DAC.

Senate may kindly consider and offer suggestions

| | | | | | | |
|---|---|---|---|---|---|---|
| Course Title | **Introduction to Photonics** | Course No | ELE5XXX | | | |
| Specialization | ECE | Structure (LTPC) | 3 | 1 | 0 | 4 |
| To be offered for | UG / PG | Status | Core ☐ | | Elective ■ | |
| Faculty Proposing the course | Prof. Srijith K | Type | New ■ | | Modification ☐ | |
| Date of DAC | 23.04.2020 | Members Present in DAC | All faculty members of the Dept. | | | |
| | | External Members: | Prof. Balaji Srinivasan, Prof. Deepa Venkitesh, Dept. of EE, IITM | | | |
| Pre-requisite | CoT | Submitted for approval | 42nd Senate | | | |

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| Learning Objectives | This course is intended to be an introductory level course in Photonics which can lead to more advanced courses such as Fiber optic communication, Photonic Sensors and Nanophotonics. |
| Learning Outcomes | At the end of the course, the learners are expected to do the following:<br>• To describe the fundamental principles of photonics and light matter interactions<br>• To apply the principles of generation and detection of photons in various problems related to photonic structures/processes and analyze them.<br>• To understand processes that help to manipulate the fundamental properties of light. |
| Contents of the course *(With approximate break-up of hours)* | Ray Optics, Wave Optics and Statistical Optics - Review of ray optics - paraxial approximation, introduction to matrix approach. Review of wave optics - interference of waves – Statistical properties of light – Spatial and Temporal coherence, Mutual coherence function - Properties of Gaussian beams (10)<br><br>Photon properties - mean photon flux, number of photons, probability of finding a photon - Interaction of photons with atoms - absorption/emission processes - Spontaneous/stimulated emission - Optical amplification – Resonator - Laser fundamentals - output power/spectrum (10)<br><br>Semiconductor photon sources and detectors – Interaction of photons with charge carriers - LEDs - output power, spectrum, modulation characteristics – Laser diodes - threshold condition, L-I characteristics, longitudinal modes, modulation bandwidth - Photodiodes - Responsivity, bandwidth – PIN and APD – gain and noise characteristics (12)<br><br>Manipulation of photons – Faraday effect – Basic principles of Electro optics - Nonlinear optics - Stimulated Raman and Brillouin scattering (10) |
| Text Books | Saleh and Teich, Fundamentals of Photonics, 2nd Ed., Wiley Publishers, 2007 |
| Reference Books | 1. J.M. Liu, Principles of Photonics, Cambridge University Press, 2016.<br>2. Ben G Streetman and Sanjay Kumar Banerjee, Solid State Electronic Devices, 6th Ed., Prentice Hall India Learning Pvt. Ltd, 2006.<br>3. A. Yariv and P. Yeh, Photonics, 6th Ed., Oxford University Press, 2006.<br>4. Ajoy Ghatak, Optics, 6th Ed., Mc Graw Hill Publication, 2016.<br>5. Eugene Hecht and A R Ganesan, Optics, 4th Ed., Pearson Education, 2008. |

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| | ***While discussing the syllabus, the Senate enquired whether the suggestions given by the External Experts are incorporated. It was informed that the tutorial hour was added as per the suggestion from the Experts. Senate has also asked regarding the percentage of overlap with existing courses and it was informed that the overlap was verified to be less than 20%.***<br>***The Senate after discussion approved the Introduction of New Elective Course.*** |
| **2020-42-Senate-05:** | **Admission only to B.Tech. Programmes with an option to pursue Dual Degree Programme**<br>The Dual Degree Programme was initiated from 2014 and over the years it has been observed that the B Tech students have always higher All India Ranks than the Dual Degree students. Also, from the placement perspective, it has been noticed that the companies prefer B Tech students.<br><br>Hence it is proposed to admit the students only for the B Tech programme from 2020 admissions and to provide option to them to upgrade to M Tech at the end of 5th Semester which will enable them to attain both the degrees at the end of fifth year.<br><br>Senate may kindly consider and approve the proposal. |
| | ***The Senate has given approval for the proposal. However, the Senate urged to devise the modalities to be followed for the upgrading to Dual Degree programme as follows:***<br>***i. Minimum CGPA required for this upgrading should be 8.***<br>***ii. The maximum number of students to be upgraded is limited to 20% of the B Tech class strength*** |
| **2020-42-Senate-06:** | **Student Intake for the year 2020-21**<br>In view of the prevailing situation due to Covid-19, as per guidelines of the Government, the institute is required to maintain social distancing in academic as well as residential blocks. It would not be feasible to adhere to the guidelines with the existing intake capacity of 350 both for B.Tech and Dual degree with additional 84 M.Tech. and Ph.D. students \. Therefore, it is proposed to reduce the student intake to 270 only for the B. Tech programme from the year 2020-21onwards.<br>It is also proposed to defer new M Tech and M Tech (Res) programmes approved in the 41st senate to next academic year due to the existing situation.<br>Accordingly, the proposed intake for the 2020-2021 academic year is submitted in the table below.<br>Senate may kindly consider and approve the proposed intake. |

| **Degree** | **Programme** | **No of Seats** | | **Total Seats** | |
|---|---|---|---|---|---|
| | | **JEE/ GATE** | **DASA** | | |
| **UG (B Tech)** | Computer Science and Engineering | 85 | 5 | **90** | **255 + 15 = 270** |
| | Electronics and Communication Engineering | 85 | 5 | **90** | |
| | Mechanical Engineering | 57 | 3 | **60** | |
| | Smart Manufacturing | 28 | 2 | **30** | |

| | | | | | |
|---|---|---|---|---|---|
| **PG (M Tech)** | M Tech in ECE with Spl. in Communication Systems Design | 20 | 1 | **21** | **84** |
| | M Tech in ECE with Spl. in Electronics Systems Design | 20 | 1 | **21** | |
| | M Tech in MEC with Spl. in Mechanical Systems Design | 20 | 1 | **21** | |
| | M Tech in MEC with Spl. in Smart Manufacturing | 20 | 1 | **21** | |
| **Ph D** | In all Departments, together | 16 | - | **16** | **16** |
| **Total** | | **351** | 19 | **370** | **370** |

***Senate has enquired whether this proposed intake is applicable this year only due to the pandemic and the Chairman, Senate has clarified that the same intake would continue in future as well.***

***The Senate after discussion approved the revised Student Intake from the AY 2020-2021.***

**2020-42-Senate-07:**

**Conduct of Ph.D. Defence Meeting online**

Ph.D. defence meeting of Mr Ashish Kumar was conducted online on 9th May,2020 with due approval of the Chairman, Senate considering the travel restrictions of experts due to pandemic. Similarly, the institute has conducted M.Tech. viva-voce for the outgoing batch online and DC meetings of existing Ph.D. students. The processes need to be continued till the situation is normal.

Senate may kindly approve the defense already conducted and may permit to conduct defence online till situation is normal.

***Senate took note of the defense conducted and approved as proposed. Further, Senate advised that all the academic formalities be completed online irrespective of academic programmes.***

**2020-42-Senate-08:**

**Ph. D. Defence Completion**

Details of PhD Scholars who have successfully defended their theses and eligible for award of the Degree are furnished below for kind perusal of the Senate.

| **1. Name of the Scholar** | **Mr. Xavier Arockiaraj S** |
|---|---|
| Roll No | EDM14D004 |
| Department | Electronics and Communication Engineering |
| **Thesis Title** | CRITERIA FOR LIMIT CYCLE FREE STATE-SPACE DIGITAL FILTERS WITH EXTERNAL DISTURBANCE |
| Date of Joining | 28.07.2014 |
| Date of Passing of Comprehensive Examination | 25.01.2016 |
| Date of Submission of Thesis | 28.06.2019 |

| | |
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| **Indian Examiner** | Prof I N Kar<br>Professor, Department of Electrical Engineering,<br>Indian Institute of Technology, Delhi |
| Date of receipt of report | 29.10.2019 |
| **Foreign Examiner** | Prof Choon Ki Ahn<br>Professor, School of Electrical Engineering,<br>Korea University, Seoul, Korea |
| Date of receipt of report | 23.12.2019 |
| Date of Ph D viva-voce examination | 09.03.2020 at 10 AM |
| Date of submission of final thesis | 18.03.2020 |
| **Doctoral Committee** | |
| Chairperson | Dr Binsu J Kailath, ECE, IIITDM Kancheepuram |
| Research Supervisor | Dr Priyanka Kokil, ECE, IIITDM Kancheepuram |
| Internal Member | Dr M D Selvaraj, ECE, IIITDM Kancheepuram |
| Internal Member | Dr S S Karthikeyan,<br>Dept. Of ECE, NIT Tiruchirapalli. |
| External Member | Prof C S Ramalingam<br>Dept. Of EE, IIT Madras. |

**LIST OF PAPERS BASED ON THESIS**

## Papers in Refereed Journals

1. P. Kokil and S. X. Arockiaraj, "An improved criterion for induced l1 stability of fixed-point digital filters with saturation arithmetic," Indonesian Journal of Electrical Engineering and Computer Science, vol. 4, no. 1, pp. 65–72, 2016.
2. P. Kokil and S. X. Arockiaraj, "Novel results for induced l1 stability for digital filters with external noise," Fluctuation and Noise Letters, vol. 16, no. 4, pp. 1– 18, 2016.
3. P. Kokil, S. X. Arockiaraj, S. Jogi and H. Kar, "New realizability criterion for digital filters with external disturbance and saturation arithmetic," AE□U –International Journal of Electronics and Communications, vol. 85, pp. 179–182, 2017.
4. S. X. Arockiaraj and P. Kokil, "New criteria for output strict and input strict passivity for interfered digital filters for biomedical applications," Journal of Medical Imaging and Health Informatics, vol. 7, no. 2, pp. 492–496, 2017.
5. S. X. Arockiaraj, P. Kokil and H. Kar, "Passivity based stability condition for interfered digital filters," Indonesian Journal of Electrical Engineering and Computer Science, vol. 6, no. 2, pp. 431–437, 2017.
6. P. Kokil, S. X. Arockiaraj and H. Kar, "Criterion for the limit cycle free statespace digital filters with external disturbances and generalized overflow nonlinearities," Transactions of the Institute of Measurement and Control, vol. 40, no. 4, pp. 1158–1166, 2018.

## Presentation in Conference

1. S. X. Arockiaraj and P. Kokil, "LMI based passivity Analysis of digital filters," International Conference on Wireless Signal Processing and Networking (WiSPNET), pp. 1129–1132, 2017.

| **2. Name of the Scholar** | **Mr. Ashish Kumar** |
|---|---|
| Roll No | PHY13D001 |
| Department | Physics |
| **Thesis Title** | CHARACTERIZATION OF SINGLE-FIBER MACH-ZEHNDER INTERFEROMETER FOR SENSING APPLICATIONS |
| Date of Joining | 29.07.2013 |
| Date of Passing of Comprehensive Examination | 07.04.2015 |
| Date of Submission of Thesis | 12.07.2019 |

| | |
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| **Indian Examiner** | Prof. Vipul Rastogi<br>Department of Physics<br>Indian Institute of Technology Roorkee |
| Date of receipt of report | 10.01.2020 (Through E-Mail) |
| **Foreign Examiner** | Prof. Prof. Sulaiman Wadi Harun<br>Department of Electrical Engineering<br>Faculty of Engineering, University of Malaya |
| Date of receipt of report | 15.01.2020 (Through E-Mail) |
| Date of Ph D viva-voce examination | 09.05.2020 at 12 Noon by Google Meet |
| Date of submission of final thesis | 19.05.2020 |
| **Doctoral Committee** | |
| Chairman | Dr Tapas Sil, Physics, IIITDM Kancheepuram |
| Research Supervisor | Dr Naveen Kumar, Physics, IIITDM Kancheepuram |
| Internal Member | Dr K Selvajyothi, ECE, IIITDM Kancheepuram |
| Internal Member | Dr S S Karthikeyan, Dept. of ECE, NIT Tiruchirapalli. |
| External Member | Prof Balaji Srinivasan, Dept. of EE, IIT Madras |

**LIST OF PAPERS BASED ON THESIS**

**Publications in Refereed Journals**

1. Naveen Kumar and Ashish Kumar (2018). Investigation on the Impact of Irregular Fringe Patterns of a Single-Fiber Mach-Zehnder Interferometer on Its Sensing Capabilities. Optical Fiber Technology, 43, 131-136.
2. Ashish Kumar and Naveen Kumar (2018). Simultaneous Measurement of Current and Temperature by Using an All-Fiber Interferometric Cost effective and Non-destructive Sensing Scheme. Optik, 171, 1-8.
3. Ryusei Momosaki, Ashish Kumar, Naveen Kumar and N N Subhashree Ojha (2019). Polarization Induced Non-reciprocal Phase Controlled All-Fiber Loop Mirror Based Inclinometer. Optics & Laser Technology, 112, 134-139.
4. N N Subhashree Ojha, Ashish Kumar, and Naveen Kumar (2020). Post-Fabrication Refractive Index Sensitivity Enhancement Technique for Single-Fiber Mach-Zehnder Interferometerr. Optical Fiber Technology, 54, 1-6.
5. Ashish Kumar and Naveen Kumar. Highly Sensitive Single-Fiber MZI Conguration for Weight Sensing. Optics & Laser Technology. (Accepted)
6. N N Subhashree Ojha, Ashish Kumar and Naveen Kumar. Sensitivity Enhancement of Single-Fiber Mach-Zehnder Interferometer by Sensitizing its Interference Length. Applied Optics. (In Press)

## Conferences Proceedings and presentations

1. Ashish Kumar, Naveen Kumar and Rananavare Atul Subarao, Analysis of Single-Mode Single-Fiber MZI Based Acousto-Optic Sensor Using Two Different Techniques, In Proc. International Conference on Fiber Optics and Photonics 2016 (PHOTONICS-2016), IIT Kanpur, W3A.47, 1-3,04-08 Dec. 2016.
2. Naveen Kumar, Ashish Kumar and Vageshna Tarun Narendra Varma, Miniaturized Single-Mode Single-Fiber MZI Based Direct Current Sensor, In Proc. International Conference on Fiber Optics and Photonics 2016 (PHOTONICS-2016), IIT Kanpur, W2G.3, 1-3, 04-08 Dec. 2016.
3. Ashish Kumar and Naveen Kumar, Miniaturized Single-Mode Single Fiber MZI Based Refractive Index Sensor, In Proc. International Conference on Advances in Optics and Photonics (ICAOP-2017) (XLI Conference of Optical Society of India), Guru Jambheshwar University of Science & Technology, Hisar, PP16, 309-312, 23-26 Nov. 2017.

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|---|---|
| | 4. Ashish Kumar and Naveen Kumar, Fabrication of Asymmetrically Corrugated Long-Period Fiber Grating by CO2 Laser Engraving/Cutting Machine, In Proc. International Conference on Advances in Optics and Photonics (ICAOP-2017) (XLI Conference of Optical Society of India), Guru Jambheshwar University of Science & Technology, Hisar, PP17, 313-315, 23-26 Nov. 2017.<br>5. N N Subhashree Ojha, Ashish Kumar and Naveen Kumar, Compact Single-Mode Single-Fiber MZI Based Strain Sensor, In Proc. Student Conference on Optics and Photonics 2018 (SCOP-2018), Physical Research Laboratory, Ahmedabad, India, P24, 116-117, 04-06 Oct. 2018.<br>6. Ashish Kumar, N N Subhashree Ojha and Naveen Kumar, Highly Sensitive and Cost-effective Optical Fiber Interferometer Based Pressure Sensor, In Proc. International Conference on Fiber Optics and Photonics 2018 (PHOTONICS-2018), IIT Delhi, SP031, 1-2, 12-15 Dec. 2018.<br>7. N N Subhashree Ojha, Ashish Kumar and Naveen Kumar, Enhancing the Sensitivity of Interferometer with Involvement of Fiber Loop Mirror, In Proc. International Conference on Fiber Optics and Photonics 2018 (PHOTONICS-2018), IIT Delhi, SP030, 1-2, 12-15 Dec. 2018.<br>8. Naveen Kumar, Ashish Kumar, Ryusei Momosaki and N N Subhashree Ojha, Operating Point Maneuvering Through Non-reciprocal Optical Biasing in Fiber Loop Mirror Con_guration, In Proc. International Conference on Fiber Optics and Photonics 2018 (PHOTONICS-2018), IIT Delhi, SP055, 1-2, 12-15 Dec. 2018.<br>9. N N Subhashree Ojha, Ashish Kumar and Naveen Kumar, Sensitivity Enhancement by Varying the Orientation of Phase Shifters Based on Non- reciprocal Phase Shift in Fiber Loop Mirror Configuration, International Conference on Optics & Electro-Optics (ICOL-2019), IRDE Dehradun, 19- 22 Oct. 2019.<br>10. N N Subhashree Ojha, Ashish Kumar and Naveen Kumar, Refractive Index Sensitivity Enchantment of a Fiber Filter by MZI Cascaded Sagnac Interferometer, Workshop on Recent Advances in Photonics 2019 (WRAP-2019), IIT Guwhati, 13-14 Dec. 2019.<br>Senate may kindly approve for issuing of provisional certificates to the scholars.<br><br>***Senate noted the same. Prof. Narayanan has urged that the Examiners should be senior Professors from reputed Universities and Institutes and that the quality of the Examiners should not be compromised. Prof. S.P. Venakteshan has advised to formulate an exhaustive list of Indian and Foreign Examiners in each research area in a Dept. and to select the Examiners from that list. The Senate has also urged not to publish in certain Journals given in the list of Publications above.***<br><br>***Chairman Senate has informed that faculty members are advised to publish only in Science Citation Indexed good quality journals and each Dept. has identified such SCI journals. The Senate has granted permission to issue the Provisional Certificate to the above two scholars.*** |
| **2020-42-Senate-09:** | **Revised Academic Schedule and Activities for Even Semester (Jan-May) 2020**<br>Keeping safety of students as first priority, academic activities of the Institute was suspended from 16th March and all the students were advised to leave their home. As the lockdown has been extended by the Government, the institute has commenced online classes for all the students. In case of graduating students, the institute has drawn a schedule to complete all academic activities by June so as to award provisional degree for their benefit. The details of the revised schedule is as under:<br>**Graduating Students:**<br>**Project reviews:** would be conducted from 15th to 30th May.<br><br>**Core and In-House elective courses**: End Semester Exams would be completed from 1st to 6th June. Grading would be done based on performance in Quiz 1, Assignments completed online and offline and also based on the online End semester examinations. The exact weightage for each has been communicated to the final years by the respective faculty members. Students having any issues with internet bandwidth are advised to write the exam on paper, scan and send the answers back by email within the stipulated time. |

**NPTEL courses as Electives (71):** The exams in case of NPTEL courses are yet to be conducted. It is learnt that NPTEL has initiated action to conduct proctored exams which students could write from their homes in June. In case, NPTEL exams could not be conducted due to any technical issues, it is proposed to adopt the following plan so as to enable students to graduate in time as most of them have already got admission for higher studies abroad.

Typically, NPTEL compute the final marks with 3:1 proportion for Assignment and End Examination. We may conduct End Exam for 50% and the Assignment for remaining 50%. Anyone scoring more than 60 may be declared as successful completion of the course.
Alternatively, we may ask the students to submit a 5-page report on their learning from the course. The reports having less than 20% similarity, after verification for plagiarism, may be declared as successful. This procedure is followed in Stanford University for few courses.

**Pre Final Years Undergoing Internship:**

The 3rd year B Tech and 4th year DD students have been undergoing their 5 months' internship from 12th May to 11th October. The students have been advised to continue working from home till the lockdown period. More than 60% of the students are working with their Project Supervisors as many of the internship opportunities are closed due to the pandemic. Their 6th/8th semester course exams will be completed, within the first two weeks, on their reporting to Institute on 12th October.

**1st / 2nd Year B Tech/DD and 1st Year M Tech**

The courses for these students are planned to be completed by conducting online classes till 15th June so that students without sufficient internet connectivity also could cope up with the material/portions provided through mail.

It is also planned to have a review of courses followed by conducting lab exams and the End semester exams from 1st July for 2nd years and 15th July for 1st years on their return to the campus. After completion of exams, it is planned to commence the Odd Semester classes (Jan- May 2021) without any vacation.

However, in case of continuation of lock down, it is proposed to conduct online examinations for end semester with at least 1-2 days gap between exams. All the exams would be completed by 15th July. Students having any issues with internet bandwidth will be advised to write the exam in paper, scan and send the answers back by email within the stipulated time.
Grading for theory courses would be done based on performance in Quiz 1 (conducted in February), Assignments / Project / surprise or other tests and online End Semester Examination. Weightage for each component would be decided by the respective faculty member and would be communicated to the students.
Grading for practice courses would be done based on daily performance, mid semester exam, regular viva, project etc. Conductance of End Semester Examination for lab courses is not appear to be practicable, therefore, the faculty members will adopt suitable method and communicate the grading scheme to the students.

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| | The Senate discussed as follows: |
| | ***Final Year Students;***<br>***Revised Academic Schedule and Activities for Even Semester (Jan-May) 2020 was discussed in detail in the Senate. Senate was apprised of completing the Project Reviews online. Senate was also informed regarding the ongoing End Semester Examinations which will be completed by 6th of June. Senate verified the way/mode the exams are conducted. Senate also urged to confirm the availability of students for online exams. It was informed to the Senate that students having any difficulty with internet connectivity were given the option to write the answers in paper, scan and send back within a stipulated time based on the duration of exam.***<br><br>***Project Reviews***<br>***Scheme of Evaluation for the Project reviews completed during 15th to 30th May 2020 to be as follows:***<br>***Mid Semester Review conducted at Institute: 20%***<br>***End Semester Review conducted Online: 30%***<br>***Supervisor 30%***<br>***External Examiner 20%***<br><br>***Core and In-House Elective Courses:***<br>***Grading for the courses would be done based on performance in Quiz 1 (conducted in Februa))y and other quizzes (if any), Assignments / Project / surprise or other evaluations and online End Semester Examination.***<br><br>***The evaluation scheme proposed is as given below:***<br>***Quizzes: 30-50%***<br>***Assignments/Project/other tests/Research Presentation: 30-50%***<br>***Online End Semester Examination: 30-50%***<br><br>***Senate advised that the above distribution should be just a guideline, the faculty member can vary the weightage for each based on the course. The same is to be communicated to the students.***<br>***The Senate advised to issue the course completion certificates without any delay to the students as and when they complete the credit requirements. Accordingly, it is planned to issue the course completion certificates by 15th June to students who would be completing project reviews and all exams by 6th June.***<br><br>***NPTEL Courses as Electives***<br>***Senate was apprised of the Schedule of End Examinations announced by the NPTEL on 2nd June 2020. The Senate directed that students who have registered for the NPTEL courses should attend the exam scheduled by NPTEL. In case any student is not able to give the NPTEL exam due to genuine reasons, considering the existing situation, exams may be conducted as proposed in the Senate. In such cases, assignment score from NPTEL will be given 50% weightage, and the exam will have the remaining 50% and whoever scores at least 60% will be earning the credits of the course.***<br>***And the course completion certificates would be issued to such students after they complete the exam by NPTEL or exam by Institute.*** |

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| | ***Pre-Final Year Students Undergoing Internship:***<br>***Senate has given approval to conduct the 6th / 8th End semester examinations of the above students when they rejoin the Institute in October after Internship. The mode of the examination could be decided based on whether the Academic activities being held online or on campus then.***<br><br>***1st / 2nd Year B Tech, 1st / 2nd / 3rd Year DD and 1st Year M Tech Theory Courses***<br>***Senate has granted approval to complete the courses by 15th June and to conduct online End Semester Examinations before 10th July. Students having any issues with internet connectivity will be advised to write the exam in paper, scan and send the answers back by email within the stipulated time.***<br><br>***Grading for the courses would be done based on performance in Quiz 1 (conducted in February) and other quizzes (if any), Assignments / Project / surprise or other evaluations and online End Semester Examination.***<br><br>***The evaluation scheme proposed is as given below:***<br>***Quizzes: 30-50%***<br>***Assignments/Project/other tests/Research Presentation: 30-50%***<br>***Online End Semester Examination: 30-50%***<br><br>***Senate advised that the above distribution should be just a guideline, the faculty member can vary the weightage for each based on the course. The same is to be communicated to the students.***<br><br>***1st / 2nd Year B Tech, 1st / 2nd / 3rd Year DD and 1st Year M Tech Theory Courses***<br>***Senate discussed in detail how effectively an online evaluation could be done for lab courses and asked to explore the possibility of conducting the exams when the students join back as the Institute reopens. However, the Chairman, Senate has informed the Senate that it's better to complete all evaluations before the commencement of next semester. Accordingly, the Senate granted approval.***<br><br>***Grading for practice courses should be done based on the lab sessions the students have completed on campus until lockdown as around 70% of the lab sessions would have been completed by then. Weightage could be given to daily performance, mid semester exam, regular viva, project etc. as the case may be for the course.***<br><br>***The evaluation scheme proposed is as given below:***<br>***Daily performance 30-50 %***<br>***mid Semester exam / Project 30-50%***<br>***Regular viva 30-50%***<br><br>***In case any online evaluation has been done for any lab courses by the faculty members, the same could also be considered along with the above.***<br>***The faculty members can adopt the suitable grading scheme for the lab course and communicate the same to the students.*** |
| **2020-42-Senate-10:** | **Revised Academic Calendar for Jul-Nov 2020**<br>In the Academic Calendar approved by the 41st Senate, the Odd Semester was proposed to commence from 23rd July. However, taking into account MHRD/UGC |

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| | guidelines, the Odd Semester is scheduled to commence from Monday, 3rd August and a revised Academic Calendar is attached as **Annexure 2.**<br>Classes would be delivered online until the students could report to campus. Special sessions will be conducted for lab courses to compensate for the missed classes.<br><br>The academic schedule of M Tech 1st year is expected to be same as the above as CCMT has already initiated the admission process.<br><br>The academic schedule for the first years who will be admitted based on JEE 2020 will be different from the schedule of the seniors. As and when the dates of JoSAA/CSAB counseling rounds are announced, the academic calendar for the first years will be prepared and submitted to Senate for approval. **Annexure 2** |
| | ***Senate has approved the revised Academic Calendar for the existing students. Classes would start from 3rd August in online mode. In order to conduct lab sessions, utilizing resources such as Virtual Labs developed by IITs or any other Govt. portals has to be explored. And the hands-on practice sessions could be conducted when the students report back to campus as Institute open for academic activities.***<br><br>***However, the Senate has urged not to combine M Tech 1st year students along with the existing students as some of the former would be completing their B Tech programme late due to the existing situation. Starting the classes on August 3rd for them would be inappropriate. And the Senate has asked to align the academic schedule of M Tech 1st year students along with that of B Tech 1st year students.***<br><br>***Accordingly, as per the Senate advice, as soon as the counseling and admission rounds of CCMT and JoSAA/CSAB are declared, the new Calendar applicable for them would be prepared and circulated among the Senate Members for approval.*** |
| **2020-42-Senate-11:** | **To approve selection of a PDF in the Institute**<br><br>An application has been received from Ms. S Shoba who has submitted thesis in the Dept. of CSE in 2019 at SSN, Chennai for the position of PDF. The Chairman Senate has constituted departmental Selection Committee (DSC) and Institute Selection Committee (ISC). The candidate presented her research work and proposal for PDF to both the committees and based on the recommendation from DSC and ISC, Chairman Senate has granted approval for her selection as PDF of the institute.<br><br>Senate may kindly ratify the decision. |
| | ***Senate has ratified the decision of the Chairman Senate.*** |
| **2020-42-Senate-12:** | **Conduct of Supplementary Examinations of Final Year Students Online in case Students could not report to campus on 1st July**<br><br>It is planned by the Institute to declare the results of final year students by 15th June. 23 students from the graduating batch are found to have backlogs. Accordingly, the supplementary examinations are planned to be conducted in July.<br><br>However, in case of continuation of lock down, it is proposed to conduct the supplementary Examinations also online only for the final years. The pattern/mode of examination would be decided by the course faculty member and would be communicated to the students.<br>Supplementary Examination of students other than the final years is planned to be conducted only after the students report to campus after the restrictions are released. |

<table>
<tr><td></td><td>Senate may kindly consider and advise suitably.</td></tr>
<tr><td></td><td>The Senate has granted permission to conduct supplementary examination online for the final year students in July 2020. The maximum number of papers a student can appear for the supplementary in July 2020 is limited to 3.</td></tr>
<tr><td>2020-42-Senate-13:</td><td>Permission to issue Provisional Degree Certificates to the Students who complete the credit requirements by 31st July<br>Institute has planned to complete the regular examinations in June and Supplementary Examinations in July for the final year students. The students of the graduating batch are listed in the Annexure 3 attached herewith. There are 304 proposed Graduands from B Tech, DD and M Tech Programmes. As the convening of convocation is likely to be delayed in view of prevailing condition, it is proposed to issue provisional certificate for the benefit of these students.
<table>
<tr><th>Degree</th><th>Programme</th><th>No. of Students</th></tr>
<tr><td rowspan="4">B Tech</td><td>COE</td><td>40</td></tr>
<tr><td>EDM</td><td>39</td></tr>
<tr><td>MDM</td><td>37</td></tr>
<tr><td>MSM</td><td>31</td></tr>
<tr><td rowspan="5">B Tech and M Tech</td><td>CED</td><td>40</td></tr>
<tr><td>ESD</td><td>19</td></tr>
<tr><td>EVD</td><td>20</td></tr>
<tr><td>MFD</td><td>18</td></tr>
<tr><td>MPD</td><td>17</td></tr>
<tr><td rowspan="4">M Tech</td><td>CDS</td><td>10</td></tr>
<tr><td>EDS</td><td>9</td></tr>
<tr><td>MDS</td><td>12</td></tr>
<tr><td>SMT</td><td>12</td></tr>
<tr><td colspan="2">Total Students</td><td>304</td></tr>
</table>
Senate my kindly grant approval to issue provisional Degree Certificates to the students who complete the credit requirements by 31st July 2020. Annexure 3</td></tr>
<tr><td></td><td>The Senate has granted approval to issue provisional certificates to all students who complete the credit requirements on or before 31st July.</td></tr>
<tr><td>2020-42-Senate-14:</td><td>Any other matter with permission of the Chair:</td></tr>
<tr><td></td><td>The Chairman has asked if the HoD’s have any item to be discussed and Prof. B. Raja, the Head of the Dept. of Mechanical Engineering pointed out the need for a Design Department in the Institute. The Chairman also discussed regarding forming a new Department as Applied(Basic) Sciences and Humanities Department comprising of faculty members from Physics, Mathematics and English.<br><br>The Senate members have univocally agreed on the proposal and emphasized the need of Design department as the IIITDM has a special mandate to impart engineering education with a thrust to design and manufacturing. Senate also advised to form a committee in line with BoG approval to finalize the design curriculum at the earliest.</td></tr>
</table>

The next meeting of the Senate will be held in August/September 2020.

**(A. Chidambaram)**
**Secretary**

**(Dr. Binsu J Kailath)**
**Dean - Academics**

**(Prof. B. Majhi)**
**Chairman**

# Proposal for Advancing Design in IIITDM Kancheepuram through a School of Interdisciplinary Design and Innovation

**Version 1.0**

7 Sep 2020

**Indian Institute of Information Technology, Design and Manufacturing**
**Kancheepuram, Chennai 600 127**

# Contents

## 1. Prologue:

Indian Institute of Information Technology, Design and Manufacturing Kancheepuram (IIITDM) is an institute of national importance under MHRD setup in 2007 with a vision to produce a new breed of engineers to support the competitiveness and growth of the Indian manufacturing sector with IT/knowledge-intensive and creative products and processes. In other words, a model of engineering that synthesizes the best practices of IITs (Technology), IIITs (IT), and NIDs (design). IIITDM has also been strategically placed in the proximity of the manufacturing cluster in Chennai.

IIITDM, under the mentorship of IIT Madras, started implementing the above mandate by adopting an inter-disciplinary and design-oriented engineering curriculum in 2009 in three streams - mechanical, electronics and computer engineering. This was followed by a major enhancement in 2014 where 17% credits were devoted to the design spine (a series of design and management courses right from the first semester). This model is in line with the recommendations of the India Design Council Report (2014)[1], and institutions such as Singapore University of Technology and Design that started around the same time and with similar mandate.

In order to help students realize their potential (students come through JEE Mains / JOSSA selection process, and the median AIR is around 25,000) and move closer to output quality envisaged in the vision, IIITDM introduced some unique practices in the design spine. These include vertical integration of the design and management courses between semesters 3-6 to enable students to identify and translate ideas to PoCs, industry open house events once every semester to expose students and their concepts/PoCs to industry experts, a 5-month internship at the end of the 6th semester, and a framework to assess design competence[2]. These practices along with the incubation ecosystem have been instrumental in IIITDM being placed in the Band-A (Rank 11-25) among the Institutes of National Importance in the Atal innovation ranking (ARIIA 2020). The undergraduate and dual degree programs have also started gaining recognition with companies such as AMD, Daimler, MathWorks, PayPal, Saint Gobain, Samsung, TAFE, Trimble, TVS Motors, and tech startups. IIITDM students have also got admissions into graduate and PhD programs in institutions such as Dartmouth, Univ of Minnesota, Umass Amherst, Columbia Univ, Trinity College (Dublin), TU Delft, NTU, IITM, IITB, IISc & IIMs.

[1] India Design Council Report (2014): A Concept Note - Design Spine for Undergraduate Engineering Students @ NIT's, http://indiadesigncouncil.org/pdf/EngineeringDesignSpine.pdf

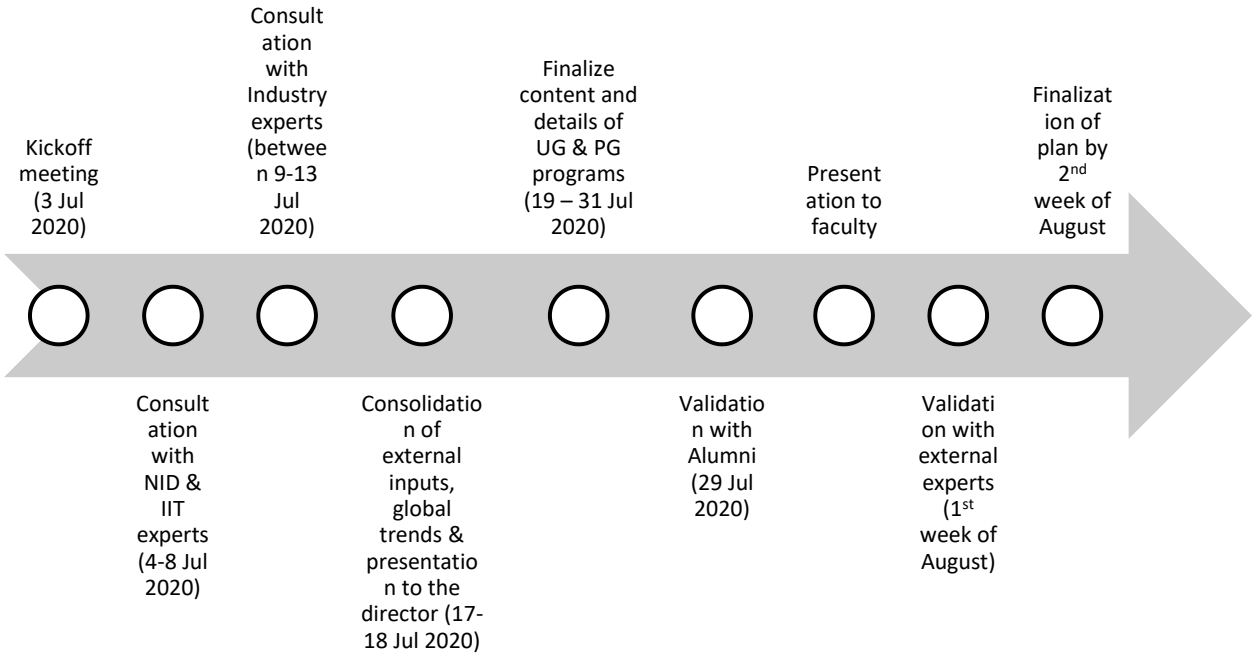
[2] Sudhir Varadarajan (2020), Measuring the value of systems thinking for design-centric engineering education, International Design Conference - DESIGN 2020, https://doi.org/10.1017/dsd.2020.72

In the current context, where the manufacturing industry in India is re-inventing itself to move up the value chain, and needs to plug supply chain gaps towards creating a self-reliant India, it is imperative that IIITDM must play a pivotal role by providing suitably trained and properly oriented talent that can directly fit future industry requirements. In this regard, IIITDM Board of Governors (BoG) recommended setting up a sub-committee under the leadership of Prof. G Venkatesh (member of the IIITDM Senate) and Mr Krishna Giri (member of IIITDM BoG) to review and recommend suitable changes in its curriculum. In response, Prof. Banshidhar Majhi (Director, IIITDM Kancheepuram) invited Prof. G. Venkatesh and Mr. Krishna Giri (member of the BoG) to guide the process, and Dr Sudhir Varadarajan (Dean – Design, Innovation, Incubation) to convene a set of consultations with internal and external stakeholders (email dated: 8 Jun 2020). This proposal presents the scope, objectives, and recommendations of the sub-committee.

Dr Sudhir Varadarajan convened an initial meeting of the BoG sub-committee (Prof. Venkatesh and Mr Krishna Giri) on 12 Jun 2020 to discuss the scope, objectives of the sub-committee and identify stakeholders for internal and external consultation. Prof. Venkatesh was nominated as the chairman of the sub-committee, and three specific objectives were defined:

1. To clearly articulate the demand from industry, products to be produced by IIITDM & their positioning
2. To review and strengthen the design-centric engineering curriculum in terms of the overall structure, the content of the design-spine, and its integration with the rest of the courses
3. To recommend an appropriate organization and budget to strengthen the design spine and the future programs to expand the footprint and impact of IIITDM on the industry/society

The constitution of the sub-committee, and the external experts for consultation are shown in Appendix-1. The experts covered academia (NID-Product/Industrial Design and IITs-Engineering Design) and industry (Automotive, Consumer Goods, Process Industry, Digital, Consulting). All the interactions with external experts, within the sub-committee, with alumni and faculty were conducted online (Google Meet/Teams) due to COVID-19. The consultation process along with the timeline is shown below:




## 2. Key findings from expert consultations & analysis of global trends

The key recommendations of experts with respect to the key objectives of this study are summarized in the Table below. The detailed observations of experts are given in Appendix-2.

| **Objectives of the study** | **Recommendations of experts** |
|---|---|
| Demand for digital and design-centric engineers (B.Tech) and Product Designers (M.Des) | • There is demand for creative engineers and product designers. But it is latent and not reflected in the placement process or entry level salaries.<br>• IIITDM must actively work with the potential recruiters and position its products and create demand. Faculty, alumni and students must be the brand ambassadors<br>• M.Des program may focus on product design. The specialization can evolve from projects over time; PhD program can be in inter-disciplinary design |
| Design curriculum for B.Tech and M.Des programs | • Embracing design means creating a learning environment that nurtures curiosity, risk taking and innovation. Questioning is the most important ingredient to catapult innovation. Marks should be given to good questions rather than given to good answers<br>• This process must start early (from the 1st semester) and continue through the program<br>• The learning-by-doing approach must pervade all the design courses, and atleast the key engineering courses where fundamentals must be strong |
| Appropriate organization to support design programs | • An independent & flexible organization will be required to attract talent (faculty, students, industry).<br>• The focus must be on creating a new culture of learning, increase choices for students, and encourage product innovation at B.Tech, M.Des and PhD levels |

The sub-committee also analyzed various global trends in engineering and design education, starting with the recent NEET (New Engineering Education Transformation) initiative at MIT[3]. The NEET initiative articulates that future students must learn to work on machines and systems that are complex, highly networked and part of larger systems of systems, have higher levels of autonomy and are supportive of a sustainable environment. They will need to exhibit qualities such as Learning how to learn; Making; Discovering; Experimental; Creative; Systems thinking; Critical and Metacognitive thinking; Interpersonal skills; Personal skills and attitudes; Humanistic; Analytical thinking; Computational thinking. To develop these qualities engineering institutions must approach the overall training very differently, with emphasis on cross disciplinary, integrative, and problem-based learning. They must also work energetically to overcome academic inertia, conservative influences in accreditation and professional societies, and the hiring practices of major companies. The last point echoes the recommendation of experts that IIITDM will need to create and position its products in the Indian context. The sub-committee also took cognizance of the design-centric programs launched by institutions such as Olin College[4], Singapore University of Technology and Design (SUTD), University of Twente, TU Delft, and the developments in design education in India[5]. It may be noted that the model of design-centric program started in 2014 in IIITDM has strong resemblance with the above initiatives in terms of the intent and high-level structure. However, major differences exist in terms of control over selection of students, the choices for students, student-faculty ratio, and the overall implementation of the program.

## 3. Products, programs, and curriculum to advance the mandate of IIITDM

Given the lack of control over student selection, and the possibility that not all students joining IIITDM Kancheepuram may select the institution based on the "D" (some may join because it is an Indian Institute or a GATE to a PSU, while others may join thinking it is a IIIT), the sub-committee felt the need to categorize students and provide choices for different categories to pursue their interests. In addition, the steep challenges in creating and positioning high value design-centric engineers and product designers also meant that some of the categories will need to receive a greater amount of design content and hand holding. Based on these factors the sub-committee decided to have three categories of IIITDM products:

1. Design-centric engineers: All engineers entering IIITDM will have a certain level of exposure to product design and digital that will differentiate them against engineering

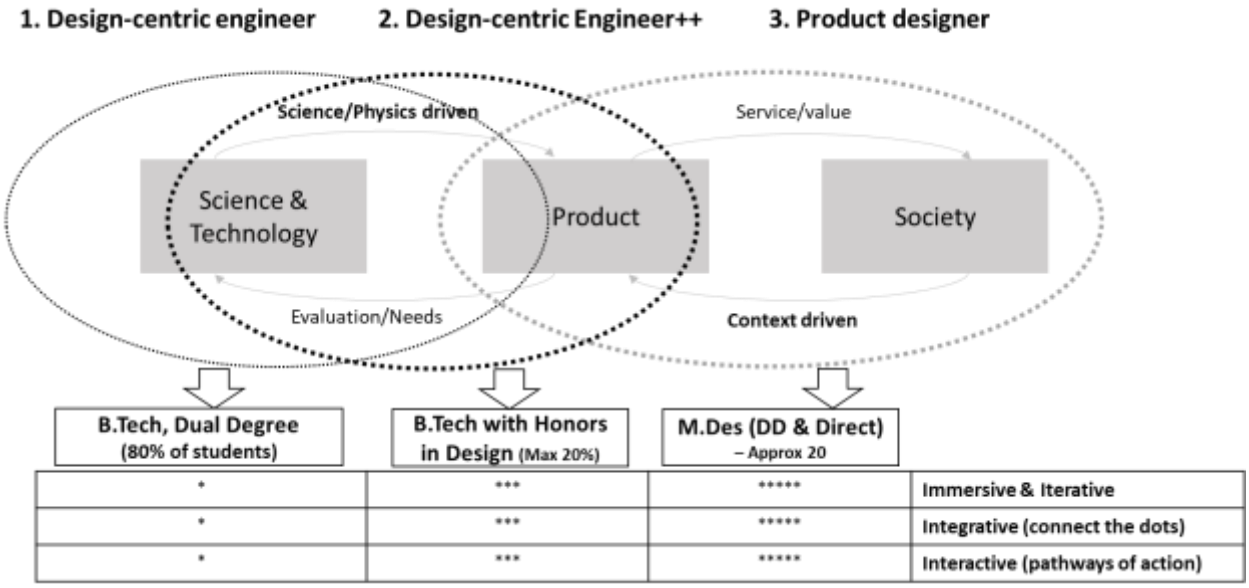
[3] https://neet.mit.edu/ and http://news.mit.edu/2018/reimagining-and-rethinking-engineering-education-0327

[4] Goldberg D. and Somerville M. (2014), A Whole New Engineer: The coming revolution in Engineering Education, Three Joy Associates, Michigan

[5] Balaram S (2011), Thinking Design, Sage India, 2nd revised edition; and Mandar Rane (2017), The design journey of Prof. Nadkarni (IDC, IITB)

students coming from other institutions in terms of their problem-solving capability. They will receive the regular B.Tech degree. They may pursue their career aspirations in engineering – technology jobs, masters programs in technology (India or abroad) or join PSUs. About 70-80% students may fall in this category.

2. Design-centric engineers++: Those who have an inclination for a career as solution architects, product designers, entrepreneurs or product managers will be taken into a separate stream and given an additional six electives (from the advanced M.Des courses) and supported through the internship. They will receive a B.Tech in their program of study along with a Honors in Product Design. About 20-30% of students may fall in this category. A few from this group may opt for a 5-year Dual Degree program in B.Tech + M.Des. The products in this category will be the brand ambassadors of IIITDM
3. Product Designers: These will be close to the type of products produced by the M.Des programs in NIDs and IDC/IITB. This product category does not exist in IIITDM portfolio today. About 20 students may be inducted in this program.

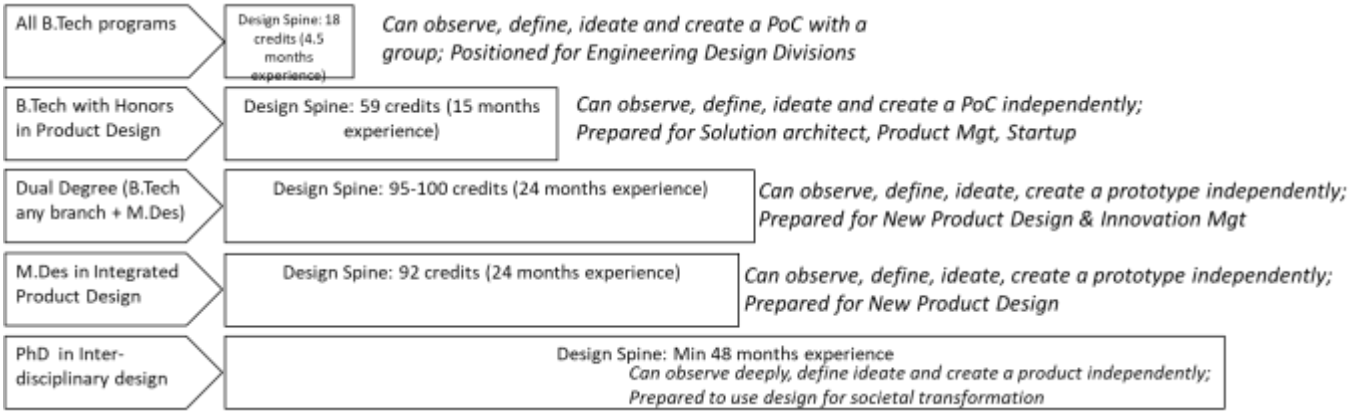



The distinctions between the three product categories can be better understood using the model proposed by Prof. Toshiharu Taura (2014)[6]. The model distinguishes between engineering design and industrial/product design using the relationship between Technology-Product-Society. Engineering design is largely science-driven and operates in the T-P space, while product design is context driven and operates in the S-P space. The methods developed in engineering design to a large extent assume that the purpose of the product and its

[6] Toshiharu Taura (2016), Creative Design Engineering: Introduction to an interdisciplinary approach, Elsevier, London

requirements are known, and focus on translating the requirements into fine grained functions, and leveraging principles of physics to create appropriate mechanisms and structures that are fit for purpose. The methods developed in product design largely focus on surfacing the unstated needs from the context (economic, social, ecological) and defining the purpose of the product, its architecture, and interaction between the product and the users, and value creation. Product innovation requires a synthesis of both perspectives. The effectiveness and efficiency of product innovation will be far higher if engineers understand the context better, and when product designers understand the constraints, and when you have a special breed of engineers (Design-centric engineer++) who are able to connect the dots between technology and user insights, resolve contradictions and improve collaboration through dialogue. IIITDM hopes to produce these three types of products who can contribute to the competitiveness of the Indian manufacturing industry.

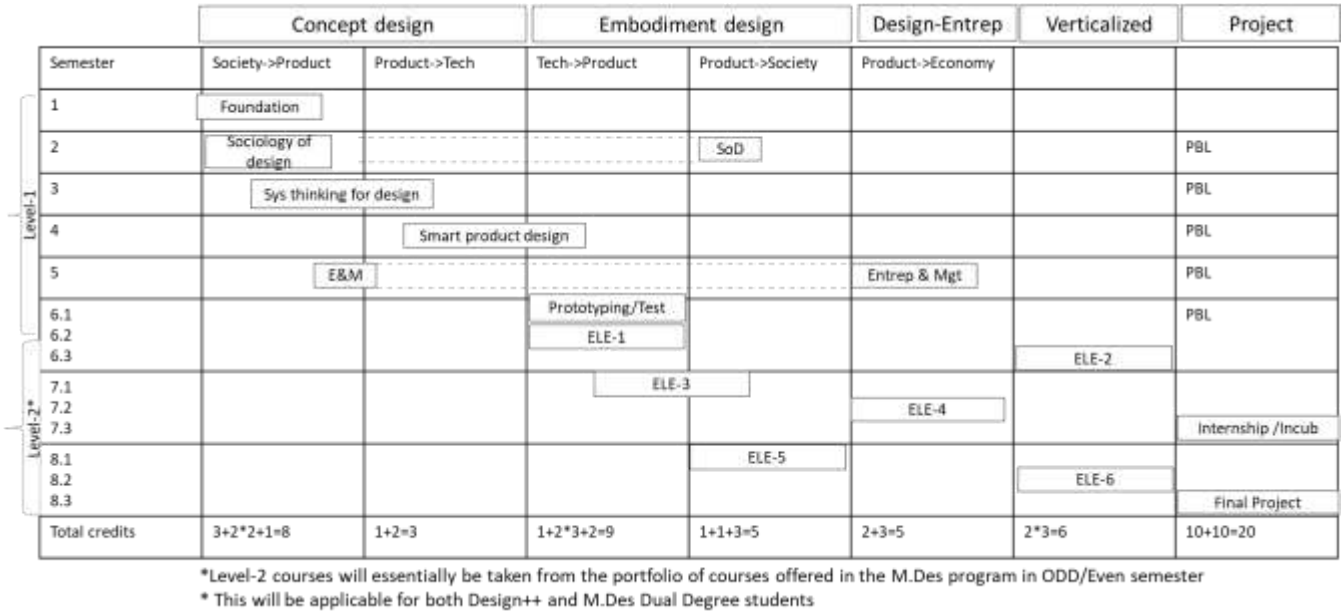
The relative maturity of design spine in the five product lines is shown in the figure below:




It may be noted from the above figure that the Honors in Product design and the Dual Degree in M.Des will be the marquee products or brand ambassadors of IIITDM.

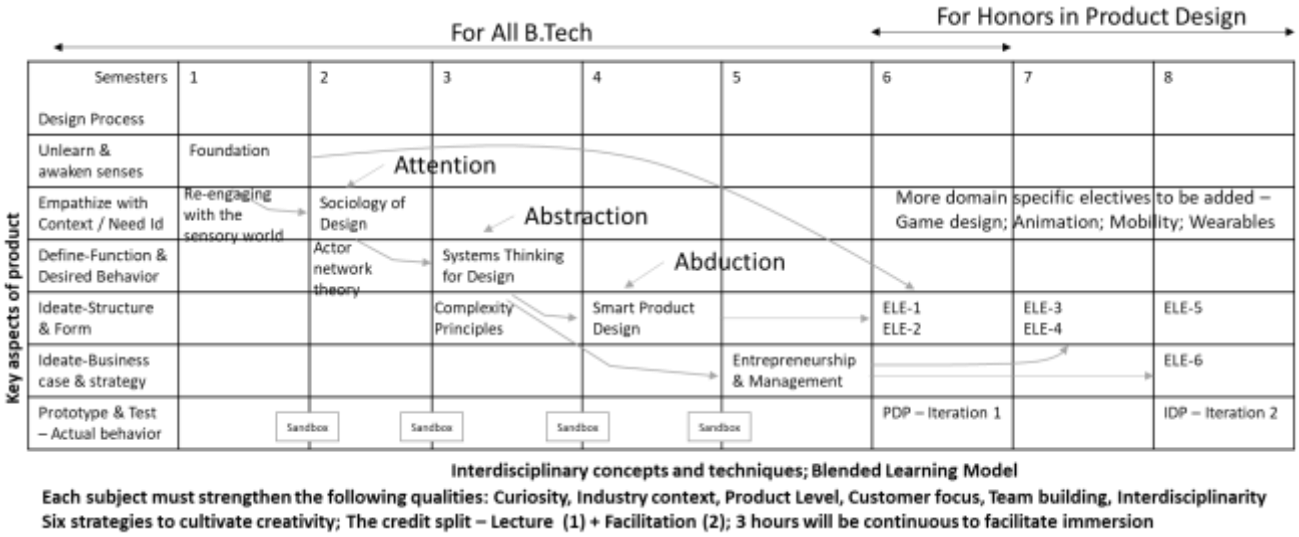
### 3.1 Bachelors Programs (Design-Centric Engineer & Design-Centric Engineer with Honors in Product Design)

The curriculum of the design spine for design-centric engineers (B.Tech) and design-centric engineers++ (B.Tech with Honors in Product Design) is shown in Figure below:




*Level-2 courses will essentially be taken from the portfolio of courses offered in the M.Des program in ODD/Even semester
* This will be applicable for both Design++ and M.Des Dual Degree students

The curriculum has a foundation program in the first semester to help students to unlearn and rediscover their creative selves. The sequencing of subjects across semesters, problem-based learning and exposure to external jury at the end of every semester ensures that students gain hands-on experience in the process of product design right from need identification to PoC and business case development. The choice of subjects and their syllabus is designed to facilitate inter-disciplinary synthesis as shown in the Figure below:



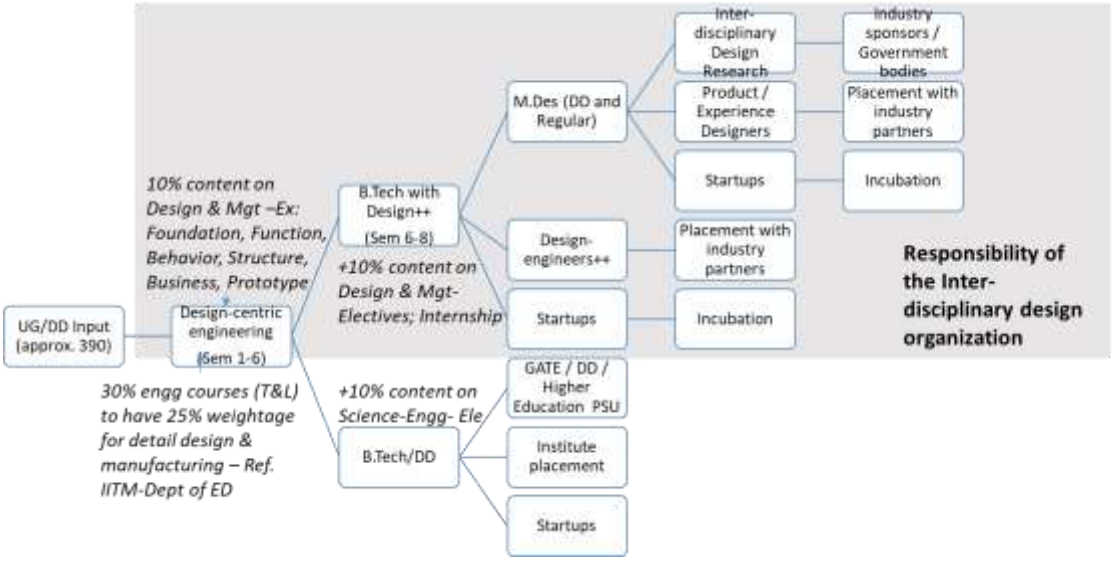

The snapshot of the syllabus for the six design courses for all B.Tech is shown in Table below. Each subject is designed to enhance creativity in a certain way. The detailed syllabus for the courses is provided in Appendix-3.

| Subject Name | Foundation | Sociology of Design | Systems Thinking for Design | Smart Product Design | Entrepreneurship & Management | Prototyping & Fit |
|---|---|---|---|---|---|---|
| Objective | Unlearn<br>Learn to observe | Empathize<br>Surface needs | Define<br>Purpose-Fn-Behavior | Ideate<br>Fn Arch-Struc-Form | Business Case | Prototype (scaled down) |
| Contents | Unlearning<br>Immersion<br>Sketching objects<br>Photography | Ethnography<br>Rich pictures<br>Narrative writing<br>ANT/SI/Semiotics | Stakeholder analysis<br>Frame objectives<br>Functional hierarchy<br>Complex systems | Level of smartness<br>Functional arch<br>Fn-Struc mapping<br>Approp AI meths | Mkt / Micro economics<br>Comp, Strategy & Org<br>Asset & Resource Mgt<br>Compliance | MVP/BoM<br>2 Hackathons<br>DFM; Agile<br>Project Mgt |
| Pedagogy & Evaluation | Learning by doing / Studio Model<br>80% Internal/Indiv<br>20% External Jury | Learning by doing /SM<br>50% Team Project<br>30% Indiv/Concept<br>20% External Jury | Learning by doing / SM<br>50% Team Project<br>30% Indiv/Concept<br>20% External Jury | Learning by doing /SM<br>50% Team Project<br>30% Indiv/Concept<br>20% External Jury | Learning by doing / SM<br>50% Team Project<br>30% Indiv/Concept<br>20% External Jury | Learning by doing / Studio model<br>70% Internal<br>30% External Jury |
| Credits | 3 | 3 | 3 | 3 | 3 | 3 |
| Equivalent courses in B.Des (IITB) | • Art & Design fundamentals-2D<br>• Captured image design | • Des Studio-1 (problem ident);<br>• Design, Society, Culture;<br>• Design history<br>• Visual studies-1; Semiotics; Storytelling | • Des Studio-2 (Prob Analysis)<br>• Knowledge orgn & communication<br>• Systems design project | • Design Studio-3 (Creative explore)<br>• Creative thinking methods | • Design management - | • Design Studio-4 (Prototyping) |
| | Creativity through immersion/observe | Creativity through meanings/listen | Creativity through connecting dots | Creativity through metaphors | Creativity through benchmarking | Creativity through paradoxes/conflict |

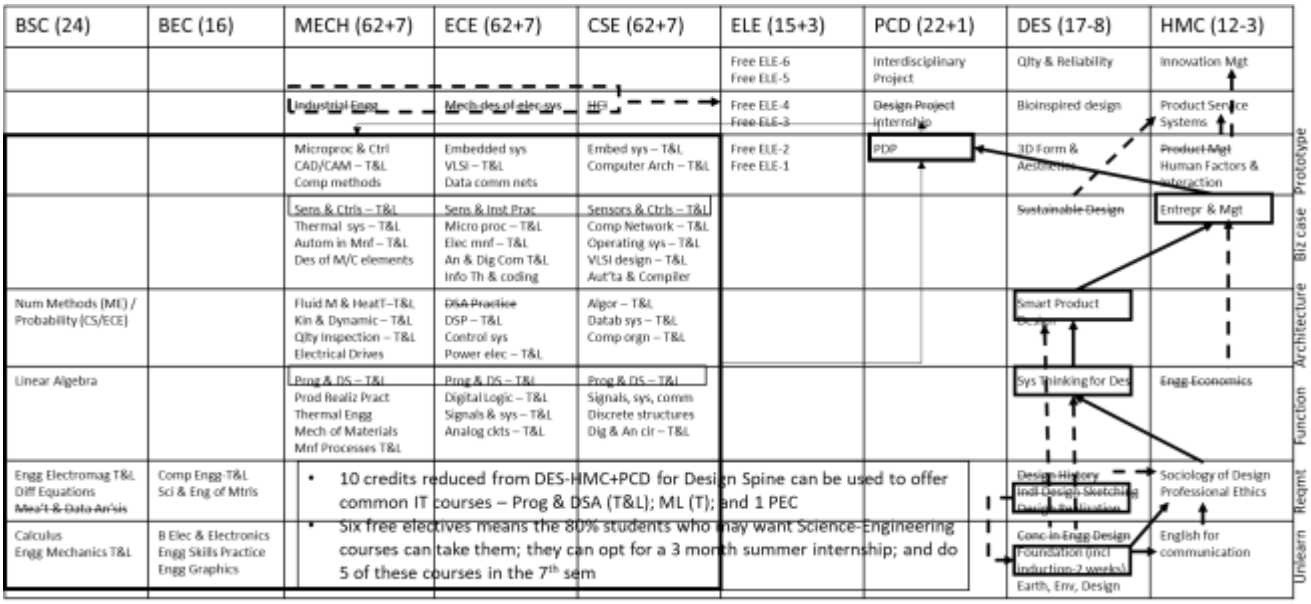
A close look at the above Figure will show that the focus is on new product conceptualization and w.r.t smart products (cyber-physical). The process of surfacing the new is not only based on attention and abstraction of the present and emerging context, but also relating to the historical socio-cultural context. In this respect Design in IIITDM is different from design in other institutions. This approach will be further enhanced in the M.Des program.

Students will be given an option to pursue honors in Product Design at the end of Semester 5 and a Dual Degree program in MDes at the end of their 6th semester. However, they will have to go through an internal selection process that will be based on the potential and performance of the student in design spine. The emphasis on providing 25% weightage for problem-based learning in 30% of the science-engineering courses (between 1-6 semesters) will help the students gain practical skills in engineering design and manufacturing at the component level.

In the sixth semester one of the electives will be a domain specific elective (Animation, Medical devices, Automotive) to ensure that students taking up internship have some background when they enter the industry. The courses offered to the design students during their internship (7th semester) will be designed to ensure that it creates opportunity for join supervision by the design faculty and discover the client context. The two courses suggested in this regard are Bio-inspired design and Sustainable PSS.

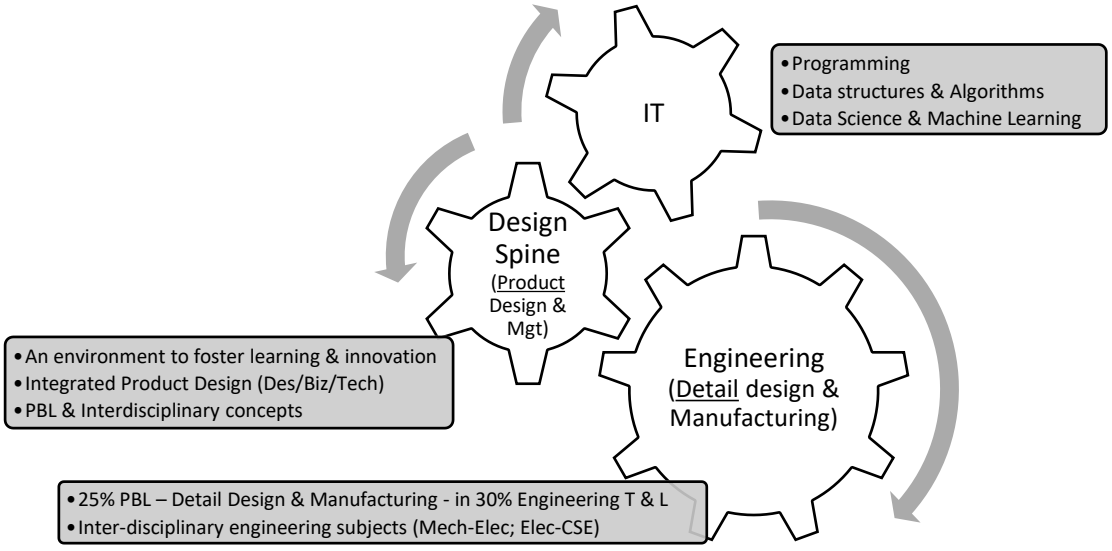



Another key aspect of the proposed design curriculum is that it does not require major changes to the overall curriculum structure. By creating the two categories and making electives open it has created space to meet the requirements of different categories of students/products.




In order to ensure that there is an element of immersive learning environment, three aspects may be emphasized: (a) organize the design courses between semesters 1-6 as a single 3-hour slot; (b) include a 1 day hackathon during the semester; and (c) align the assignments in different courses to the common problem selected by the student, preferably through an effective use of the Academic Class Committee.

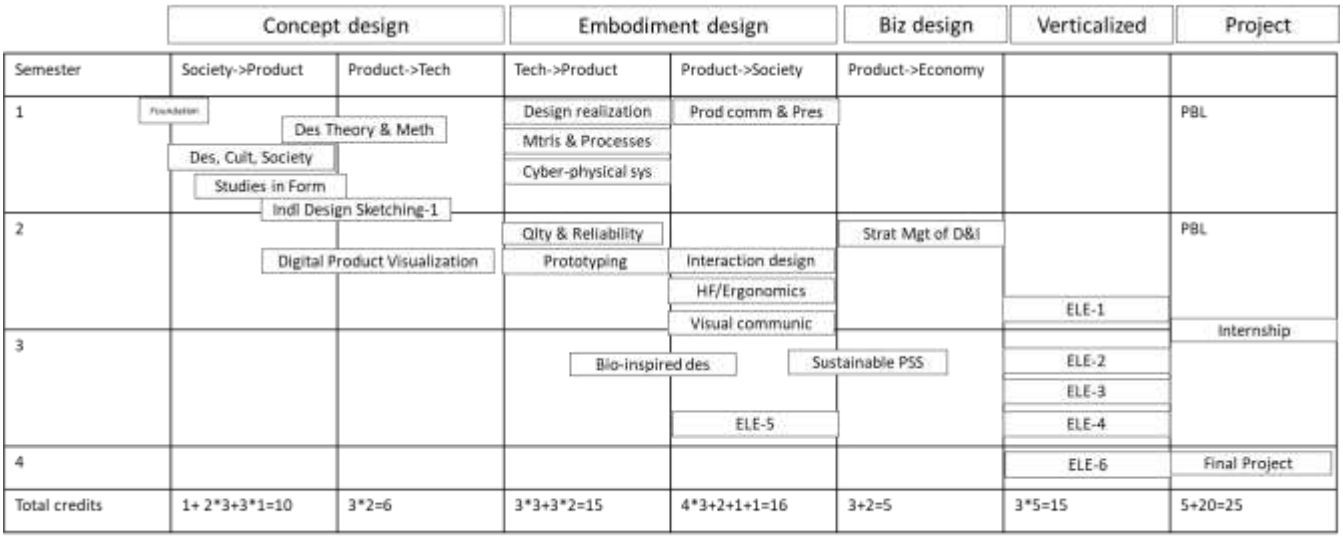
Implementation of the above proposal will create a differentiated model at B.Tech level with the right mix of IT, design and Engineering as shown below.



Needless to say, a serious commitment to learning by doing will be required to deliver a differentiated product at the B.Tech level .

### 3.2 Master of Design Program (M.Des)

In order to structure the M.Des curriculum, the sub-committee reviewed various models of M.Des in India and abroad and narrowed down to two models that seemed to be closer to the design spine finalized for the undergraduate program, namely TU Delft's Integrated Product Design and IDC (IITB)'s Industrial design. A synthesis of these two models was done to arrive at the following model for M.Des in Integrated Product Design in IIITDM.




* Dual degree Mdes students will take 6 electives from MDes semesters 1&2 in their 7th and 8th sem; and follow 9th and 10th as per regular M.Des

The students will start working on an industry provided or self-identified problem in their first semester. Each of the courses will facilitate students work on the same problem, but from the perspective of the course so that a holistic appreciation of the concept and embodiment is achieved. This will also facilitate strong immersive experience.

The M.Des program will be open for students with B.Des, B.Tech, B.Arch. CEED score will be required for selection of candidates who may receive a scholarship from the institute. For self-sponsored candidates, a minimum of two-years work experience will be required.

### 3.1 Doctoral program in Interdisciplinary Design (PhD)

It is proposed to start a PhD program in interdisciplinary design. In line with the NID philosophy, the purpose of the PhD programme will be "to support the creation of products or services that

improve the quality of life of people, meet demands to sustain the environment, improve policymaking; and better the understanding and use of design in industry, education and society at large".

"The programme shall be open to educators and professionals in design and allied fields who wish to reinvent their own practice or knowledge base while pushing the boundaries of the discipline through innovation in practice and create new design theories".

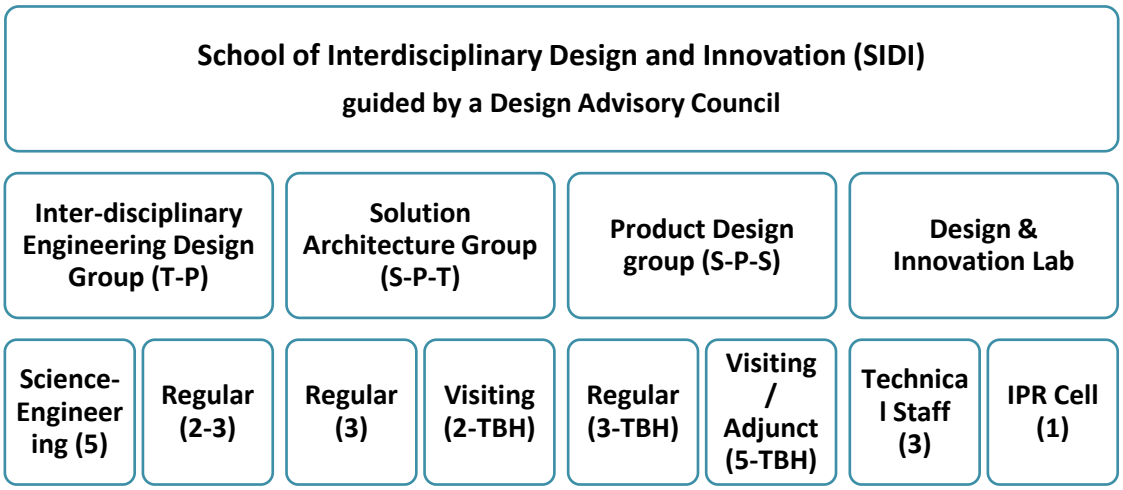
The selection will be based on an interview. The number of PhDs onboarded, the tenure of the program and the scholarship for the program will be based on IIITDM rules for PhD program.

## 4. Case for the School of Interdisciplinary Design and Innovation

The challenge to promote a new culture of learning that nurtures curiosity, create industry partnerships to create the demand and position the talent appropriately, and encourage student led product innovation calls for sustained and focused efforts by a group of full-time dedicated faculty. This may not be feasible within the discipline focused department structure or a loose coalition like a centre.

The organization will also need some flexibility in the initial stages to attract the right type of talent. It is estimated that a min of 15 faculty (and a maximum of 25) will be required to support 1170 UG students and 220 brand ambassadors (Design++, M.Des, PhD). The diversity of talent required and the challenge in attracting the right talent with experience in design and affinity for teaching calls for higher proportion of visiting faculty compared to the rest of the institute (1:1 or 1:2 in the beginning). New roles such as Professor of Practice will need to be created to attract talent.

Based on the above, it is proposed to setup a School of Interdisciplinary Design and Innovation (SIDI) with four types of expertise – Interdisciplinary engineering design; Integration between Engineering and Product Design; Product Design and a Design and Innovation Lab. The School will have a Design Advisory Council, with 6-8 experts drawn from the academia and industry, to guide its activities. A high-level organization structure of SIDI is shown in Figure below.




SIDI is different from a department in the following ways:

- It is strongly aligned with the institutional goal:
    - Advancing design and innovation in manufacturing sector
    - It is focused on encouraging student led product innovation and not restricted to pursuit of knowledge in a discipline
    - It will shape the mind of all the UG students entering IIITDM over six semesters
    - As a strategic unit, it will be mapped to the role - Dean (Design, Innovation, Incubation)
- It is a network with a few regular nodes and linkages with others:
    - Faculty recruitment & promotion (regular or visiting) will not be restricted to one discipline; contribution to design-industry is key
    - There will be a greater proportion of visiting/adjunct/guest faculty compared to regular faculty (atleast 1:1); remuneration for visiting/adjunct/guest faculty preferably as per IIT norms (Senate/BoG to guide)
    - Faculty from other departments interested in embracing design will be co-opted into specific initiatives-joint guidance of Interdisciplinary research / industry projects / incubation – quid pro quo; Similarly Design Faculty can be included in Design Project Review committees in Departments; Common Faculty orientation sessions with design experts
    - SIDI will explore opportunities to channel technology innovations of departments into products
- Its faculty will play the role of an enabler to ensure product-market fit:
    - Creating a learning environment
    - Work with industry to position students (D++, MDes)
    - Active role in product innovation & incubation

SIDI is also different from a research centre:

- Its activities include education, award of degrees (under institute name), research, consultancy, product innovation
- It has full-time faculty, recruitment & budget and its own outreach and have a goal of self-sustenance in future

The benefits to the faculty joining SIDI include:

- An opportunity to reinvent themselves (driven by a deeper appreciation of design), pursue industry oriented and inter-disciplinary work and enable student-led product innovation and startups
- All IIITDM rules applicable to faculty - # of PhDs, CPDA, etc. will remain same
- Faculty can apply for sponsored research in interdisciplinary/prod devp areas

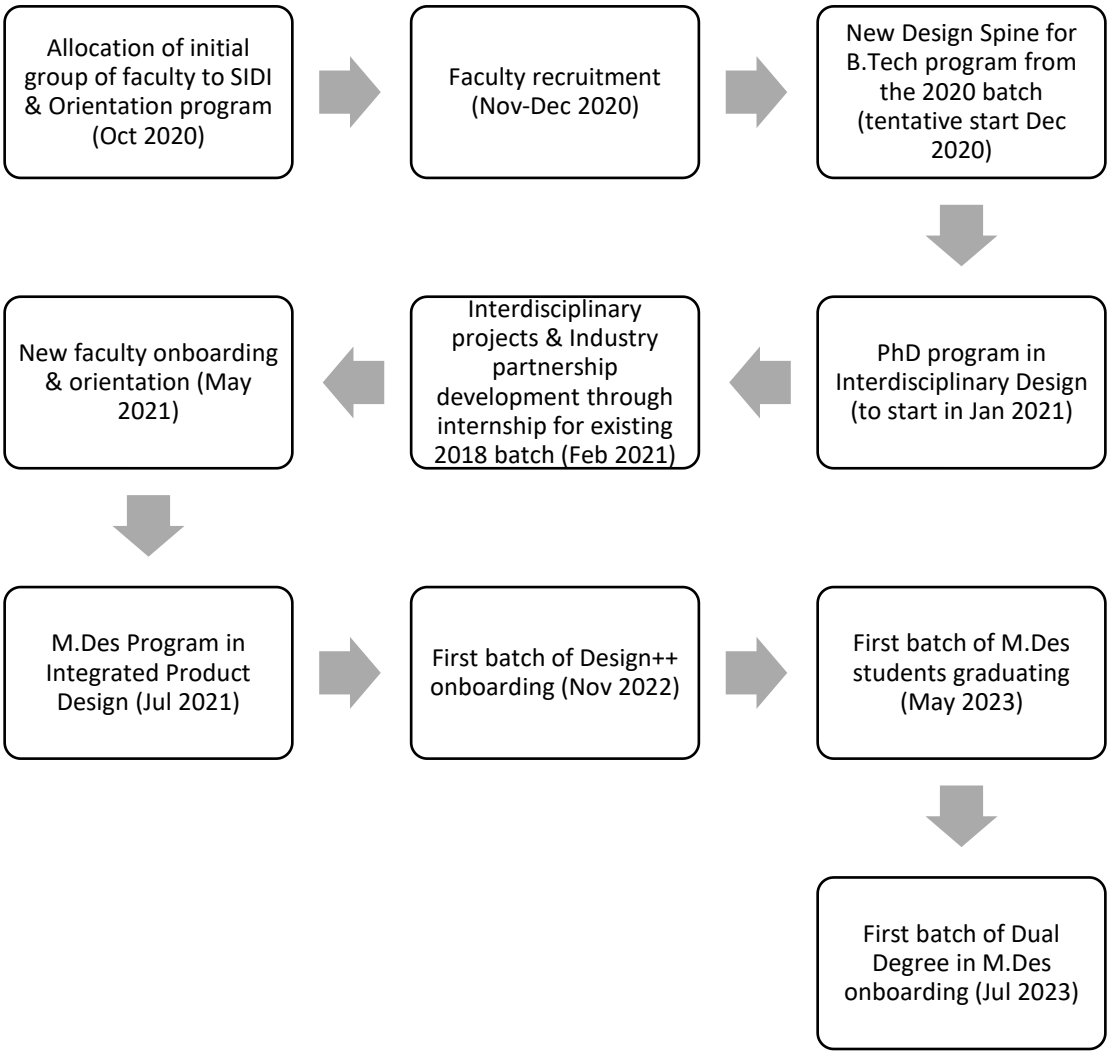
In order to seed a new culture, emphasis has to be placed on careful selection of faculty (regular and visiting), having a regular faculty orientation program with chosen experts, including a process of peer review of courses and their delivery, and effective class committee to align with engineering courses, ensuring that all faculty focus on student learning.

Indicative list of academic and industry partnerships that we will need to develop:

| | |
|---|---|
| Academia | NID; IITB; IITM; SUTD; TU Delft |
| Industry | Aditya Birla Group; Amazon; Ashok Leyland; Daimler India Commercial Vehicles; Godrej; HCL-Product Engg; JK Fenner; Mahindra & Mahindra; Mercedes Benz R&D; PayPal; Royal Enfield; Saint Gobain; Samsung; Siemens (Medical); TAFE; Tata Elxsi; TCS-Engg Services; Titan; Tube Investments; TVS Motors |

**4.1. Implementation Plan**

Suggested timeline for implementation subject to approval by the IIITDM Senate and the BoG:



### 4.2 Faculty Estimation:

Requirement based on the number and variety of courses:

| | Society-Product | Product-Technology | Technology-Product | Product-Society | Industry specific |
|---|---|---|---|---|---|
| Total courses | 7 | 7 | 9 | 8 | 6 |
| **# of courses that can be handled by current faculty** | **3** | **5** | **9** | **4** | **1** |
| # of courses where we need support | 4 | 2 | 0 | 4 | 5 |
| Logical grouping of subjects | 1. Design Theory & Meth<br>2. Foundation;<br>3. Studies in form;<br>4. Design, culture, Society; | 1. Design Research<br>2. Model based design; | | 1. Visual communication;<br>2. Product comm & presentation;<br>3. Interaction design;<br>4. Human factors & Ergonomics | 1. Animation<br>2. Game design<br>3. Biomedical devices<br>4. Non-invasive systems<br>5. Automotive design |
| **Min number of faculty to be hired to start M.Des (10)** | **3** | **1** | **0** | **2** | **4 (Adjunct/Guest)** |

Faculty estimate based on the number of students:

| | 2020-21 | 2021-22 | 2022-23 | 2023-24 | 2024-25 |
|---|---|---|---|---|---|
| Total UG students admitted | 390 | 429 | 472 | 519 | 571 |
| Total in campus (2nd year) | 305 | 390 | 429 | 472 | 519 |
| Total UG (3rd year) | 376 | 305 | 390 | 429 | 472 |
| Total UG students (2 courses p.a. for each batch | 1071 | 1124 | 1291 | 1420 | 1562 |
| **Faculty for the B.Tech program – Sem 1-6: Assuming 100 students per class, 2 classes per faculty in a semester** | **10** | **11** | **12** | **14** | **16** |
| Design++ students (4th year) | 42 | 56 | 61 | 78 | 86 |
| Dual Degree Students (5th year) | 0 | | | | 10 |
| Total M.Des Students (scholarship + self-fund) | 0 | 20 | 40 | 40 | 40 |
| Total PhD Students | 15 | 32 | 40 | 48 | 60 |
| **Faculty for the advanced design courses (approx. 8 subjects per semester; and a faculty takes 3 courses in a yr)** | **0** | **5** | **8** | **10** | **14** |
| **Total faculty required for SIDI** | **10** | **16** | **20** | **24** | **30** |

**4.3 Budget Estimate:**

Operational parameters:

| | **2020-21** | **2021-22** | **2022-23** | **2023-24** | **2024-25** |
|---|---|---|---|---|---|
| Total UG students admitted | 390 | 429 | 472 | 519 | 571 |
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| Design++ students (4th year) | 42 | 56 | 61 | 78 | 86 |
| Dual Degree Students (5th year) | 0 | | | | 10 |
| Total M.Des Students (scholarship + self-fund) | 0 | 20 | 40 | 40 | 40 |
| Total PhD Students | 15 | 32 | 40 | 48 | 60 |
| PhD Students (Institute scholarship) | 10 | 16 | 20 | 24 | 30 |
| PhD students per regular faculty | 2 | 2 | 2 | 2 | 2 |
| Self-funded PhD students per regular faculty | 1 | 2 | 2 | 2 | 2 |
| Regular Faculty | 5 | 8 | 10 | 12 | 15 |
| Visiting Faculty (Full-time) | 2 | 4 | 5 | 6 | 8 |
| Guest/Adjunct Faculty (Part-time) | 2 | 4 | 5 | 6 | 7 |
| Technical staff & IPR Cell | 2 | 3 | 4 | 5 | 5 |
| Student-Faculty Ratio (for B.Tech sem 1-6) | 133.9 | 80.3 | 73.8 | 67.6 | 58.9 |
| Student-Faculty Ratio (PhD+MDes+DD+D++) | 7.1 | 7.7 | 8.1 | 7.9 | 7.4 |

Operating Expenditure:

| **All Amount in Rs Lakhs** | **2020-21** | **2021-22** | **2022-23** | **2023-24** | **2024-25** | **Total** |
|---|---|---|---|---|---|---|
| **Faculty & Staff Salary** | **180.0** | **330.0** | **459.8** | **612.3** | **819.9** | **2402.0** |
| Total Guest Faculty cost | 12.0 | 26.4 | 36.3 | 47.9 | 61.5 | 184.1 |
| Foundation program costs per year (one expert for 2 weeks at 20K per day) | 2.5 | 2.8 | 3.0 | 3.3 | 3.7 | 15.3 |
| Total cost for Invited Talks | 1.0 | 1.8 | 2.4 | 3.2 | 4.4 | 12.8 |
| Total design studio consumables | 86.6 | 87.4 | 123.7 | 152.0 | 186.7 | 636.4 |
| Total library cost | 4.2 | 8.1 | 11.7 | 15.1 | 19.4 | 58.5 |
| Total scholarship (assuming only 50% of MDes) - TA | 0.0 | 19.8 | 43.6 | 47.9 | 52.7 | 164.0 |
| Total scholarship for PhD Students (TA) | 42.0 | 67.2 | 84.0 | 100.8 | 126.0 | 420.0 |
| 2 (1-week) Faculty orientation programs per year @ 50k per day (including expert cost / accommodation/ food) | 5.0 | 5.5 | 6.1 | 6.7 | 7.3 | 30.5 |
| Patents per faculty | 1.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Cost of patents | 5.0 | 17.6 | 24.2 | 31.9 | 43.9 | 122.7 |
| Consultancy project & Workshop expenses | 16.0 | 32.0 | 48.0 | 76.8 | 120.0 | 292.8 |
| Utilities - HVAC and Electricity (2 * 3000 sq ft lab) | 8.0 | 8.8 | 9.7 | 10.6 | 11.7 | 48.8 |
| **Total operating expenditure** | **346.3** | **575.4** | **804.4** | **1031.8** | **1337.3** | **4095.1** |

Operating Revenue:

| **All Amount in Rs Lakhs** | **2020-21** | **2021-22** | **2022-23** | **2023-24** | **2024-25** | **Total** |
|---|---|---|---|---|---|---|
| M.Des Fees | 1.5 | 1.7 | 1.8 | 2.0 | 2.2 | |
| Total Mdes Fee | 0.0 | 33.0 | 72.6 | 79.9 | 87.8 | 273.3 |
| B.Tech Fees (Design++) | 0.6 | 0.7 | 0.7 | 0.8 | 0.9 | |
| Total D++ Fee | 25.2 | 37.2 | 44.3 | 62.3 | 75.4 | 244.4 |
| Dual Degree Fees | 1.5 | 1.7 | 1.8 | 2.0 | 2.2 | |
| Total DD Fee | 0.0 | 0.0 | 0.0 | 0.0 | 22.0 | 22.0 |
| PhD Fee | 1.5 | 1.7 | 1.8 | 2.0 | 2.2 | |
| Total PhD Fee | 22.5 | 52.8 | 72.6 | 95.8 | 131.8 | 375.5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Industrial consultancy & Workshop revenue per faculty | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | |
| Total Consultancy Revenue | 20.0 | 40.0 | 60.0 | 96.0 | 150.0 | 366.0 |
| Licensing from patents | 1.0 | 3.5 | 4.8 | 6.4 | 8.8 | 24.5 |
| **Total Revenue** | **68.7** | **166.5** | **254.3** | **340.4** | **475.7** | **1305.7** |
| **Deficit (to be supported by the MHRD grant for faculty salary)** | **-277.6** | **-408.8** | **-550.1** | **-691.4** | **-861.5** | **-2789.4** |

Capital Expenditure:

| **All Amount in Rs Lakhs** | **2020-21** | **2021-22** | **2022-23** | **2023-24** | **2024-25** | **Total** |
|---|---|---|---|---|---|---|
| Furniture for design lab, WiFi, vending machine, etc | 10.0 | 10.0 | 15.0 | 15.0 | 20.0 | 70.0 |
| Design Studio Equipment (Prototyping - SRP, 3D, Electronic, Ergonomics, 25 Workstations) | 40.0 | 40.0 | 50.0 | 50.0 | 60.0 | 240.0 |
| Design Studio Software (Sketching, VR, Interaction Design, Ergonomic Analysis, Visual Communications, Game, Animation, AR) | 30.0 | 30.0 | 40.0 | 40.0 | 50.0 | 190.0 |
| **Total capital expenditure** | **80.0** | **80.0** | **105.0** | **105.0** | **130.0** | **500.0** |
| Sponsored research per faculty (assuming it contributes to design infra) | 5.0 | 6.0 | 7.2 | 8.6 | 10.4 | |
| **Total SR grant** | **25.0** | **48.0** | **72.0** | **103.7** | **155.5** | **404.2** |
| **Difference** | **55.0** | **32.0** | **33.0** | **2.0** | | |

## 5. Epilogue

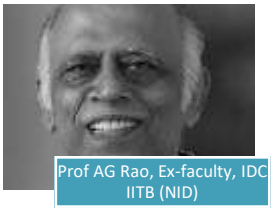
The disruption unleashed by COVID-19 has exposed the fault-lines in education at all levels. The New Education Policy (NEP) launched by the Govt of India can help institutions move towards a new model of education. The NEP calls for increasing choices for students, creating more wholesome and interdisciplinary learning experiences, and encourage student led innovation. These macro trends give strong tailwind to this proposal for advancing design through the School of Interdisciplinary Design and Innovation. The proposal strongly aligns with the vision of NEP. Design education is fundamentally about creating a new learning environment that nurtures curiosity and calls for a more unified approach to development of mind-body-morality, aspects that are fundamental to the NEP. The six free electives introduced in the curriculum creates options for engineering students in different branches to get Honors in Product Design or Minor in a different branch of engineering or science. A school structure can provide the right learning environment and tight integration of interdisciplinary content at the program level to enhance learning experience of students. It will avoid the risk of proliferation of departmental silos as single stream institutions such as IIITDM seek to create multi-disciplinary environments.

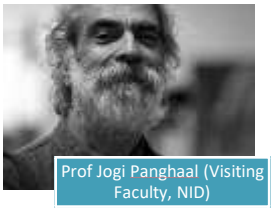
# Appendix-1

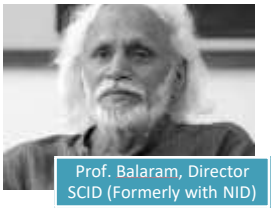
## Constitution of the BoG sub-committee:

1. Prof. G. Venkatesh, Chairman (Senate member)
2. Mr. Krishna Giri, Member (BoG member)
3. Dr Anand Lakshmanan, Member (Senate member)
4. Dr. Raja B, Member (HoD, Dept of Mechanical Engg)
5. Dr. Binsu K, Member (Dean, Academic & Dept of ECE)
6. Dr. Raguraman, Member (Asst Prof., Dept of Mechanical Engg)
7. Dr. Jayachandra Bingi, Member (Asst Prof., Dept of Physics & Founder, BiRD Lab)
8. Special Invitees associated with Interdisciplinary Projects:
    1. Dr Noor, Dept of CSE
    2. Dr Tapas Sil-HoD, Dept of Physics
    3. Dr Nachiket Khare, Dept of Maths
    4. Dr Pandiyarasan, Dept of ECE, DST-INSPIRE
    5. Dr Karthicnarayanan, Consultant to MaDeIT, Visiting Faculty & Formerly with SUTD
9. Dr Sudhir V, Convener (Dean, Design, Innovation, Incubation)

## Expert Panel from Academia and Industry


Prof AG Rao, Ex-faculty, IDC IITB (NID)


Prof Jogi Panghaal (Visiting Faculty, NID)


Prof. Balaram, Director SCID (Formerly with NID)


Mr Jinan, EKF (NID)


Prof. B Ravi, IITB

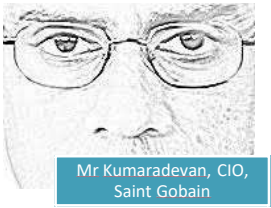

Prof. Srikant V, IITM-ED


Dr Shankar V, MRV


Mr Sathiya Seelan, Ashok Leyland (IDC, IITD)


Ms Revathi Kant, CDO, Titan


Mr Naren Ghate, CDO,Tata Elxi (IDC, IITB)


Mr Kumaradevan, CIO, Saint Gobain


Mr Abhik Chatterjee, Head of Digital, BCG

# Appendix-2: Minutes of external consultations

**IIITDM Design Spine: Consultation with NID/IDC design experts**

**Date: 04 Jul 2020, Time: 5-6 pm, Google Meet**

**Participants:**

1. Prof. AG Rao, Ex-faculty, IDC, IITB
2. Prof. Jogi Panghaal, Visiting Professor, NID
3. Prof. Balaram S, Director, Sasi Creative Institute of Design, and formerly with NID
4. Mr Jinan Kodapully, Adjunct Faculty, IDC-IITB, NID alumnus & Founder, EKF
5. Prof. G Venkatesh, Chairman, IIITDM BoG sub-committee
6. Dr Anand Lakshmanan, Member, BoG sub-committee & Senate Member, IIITDM
7. Dr Jayachandra Bingi, Member, BoG sub-committee, Asst Prof, Physics
8. Dr Sudhir Varadarajan, Convenor, BoG sub-committee and Dean (Design, Innov, Incub)

Prof. Venkatesh welcomed the design experts and thanked them for sparing time for this important consultation on the future of design in IIITDM. Dr Sudhir then made a brief presentation on the current state, challenges, future aspiration, and possible programs (IIITDM-DesignSpine-Consultation-4Jul2020.pdf) and invited suggestions from experts. The key suggestions of experts are summarized below.

**1. Design-centricity: creating a culture of learning & responsiveness to the context**

| Expert | Observations |
|---|---|
| Prof. AG Rao | 1. Introducing design means creating a strong culture of learning. It is not about addition or removal of some courses<br>2. The guiding principles that created the NID culture (1-1 faculty-student interaction, small class size, studio environment) may not be feasible in many engineering institutions (Prof. Rao highlighted experiences in IITG, IISc, IITD and IITB). There are fundamental differences in the way engineering disciplines approach learning when compared to design<br>3. A lot of time must be spent by the faculty in engaging with students, motivating them to become self-directed learners; instead of using attendance or excessive testing. Assessment methods, attendance rules etc. need to be looked at for design |
| Prof. Balaram S | 4. Design is a culture to be nurtured. It is important to nurture creativity, originality, courage to be stupid, questioning status quo right from the beginning (undergraduate and even school levels). Design should be treated as complementary to the knowledge of engineering and not as competing knowledge<br>5. The focus must be on “Thinking Design”, which is different from Design Thinking (the process). Thinking design is an attitude of "Why" while Design thinking is a process of "How" that follows from the former. Thinking design is about becoming responsive to the local and global contexts<br>6. While there is a growing interest in learning, the aspect that is often forgotten is the need for unlearning the rigidities developed in the 10+2 schooling process. A good foundation program is required to facilitate this |

| | |
|---|---|
| Prof. Jogi Panghaal | 7. It is important to create an immersive thinking and learning culture. First create a Space to work in.<br>8. It is important to nurture the values of exploration and experimentation right from the beginning (UG level); Courage to think differently, be stupid, without being taunted by teachers and peers<br>9. Logic emerges from exploration. Allow the ideas to flow by making the thoughts run wild. Here there should not be any thought that is termed as a stupid idea - every thought is welcomed; this phase is the "Creative thinking phase". Once the bucket of ideas is filled up, and the paper is all filled up with the "wild-thoughts" then start working on rationalizing and logically connecting the ideas and refining the ideas. This is a sort of "Logical/rational thinking phase"<br>10. It is important to ensure that the engineering mindset and environment (one right answer, shooting down ideas as impractical, etc.) does not stifle this process of exploration |
| Mr Jinan Kodapully | 11. Engineering institutions essentially have a teaching environment, whereas design is about creating a learning environment.<br>12. There is need for a strong foundation program to shift students from a tutored setup to an independent learning environment |

**2. Integrating design and engineering**

| Expert | Observations |
|---|---|
| Prof. AG Rao | 1. Design faculty may not have specific knowledge of different domains. There is an opportunity for design faculty to work with engineering faculty to develop domain specific frameworks<br>2. Consider a workshop model where faculty from outside co-teach with IIITDM faculty. Two faculty from within IIITDM across disciplines could also get together and run the workshop |
| Prof. Balaram S | 3. Design and Engineering are complimentary. Every course must have faculty from both the Design and Engineering domains come together and in that way, the domain requirements for each course could be built into the course<br>4. Getting more projects from the industry will help align the faculty and the students to emerging requirements and help dissolve the differences between industry and education |
| Prof. Jogi Panghaal | 5. It may be useful to look at engineering education in a different way. Engineering as an input to design |

**3. M.Des / PhD programs and research areas**

| Expert | Observations |
|---|---|
| Prof. AG Rao | 1. IIITDM must consider starting a MDes program. It will help in developing a core group of faculty<br>2. A good way to start a M.Des program is to understand the problems in the present models, especially w.r.t enabling self-directed learning<br>3. Design faculty need to work with industry professionals to develop new frameworks. There is not much happening in this space even in PhD research in India. Current PhD work in design may not be valuable for practitioners. IIITDM |

| | |
|---|---|
| | may consider addressing this |
| Prof. Jogi Panghaal | 4. Mission to produce new knowledge should be the driving force for M.Des or PhD programs.<br>5. Undertaking challenging client projects can drive this activity.<br>6. Understanding the state of the art globally will be important while launching new programs |
| Mr Jinan Kodapully | 7. M.Des programs are supposed to produce students who can respond to emerging contexts. It is the student and faculty projects that create the state of the art.<br>8. If the M.Des program is designed to enable learning, then it can always remain fresh in relation to the emerging context, unlike other programs that depend on a refresh of the knowledge base |

**4. Creation of a core group of faculty and the case for an independent centre**

| **Expert** | **Observations** |
|---|---|
| Prof. AG Rao | 1. Important to create a core group of faculty, and a separate centre with autonomy to pursue the goal of creating a learning culture<br>2. Introducing a MDes program can help attract faculty.<br>3. Given our recruitment norms (PhD etc) this becomes difficult to do, so it must be given specific attention. Some workarounds will be required to attract good faculty who may not have a PhD degree.<br>4. Industry experts may be brought in as visiting faculty. However, the centre cannot run on visiting faculty alone. The internal core group of faculty must be the link between visiting faculty and the centre/students. Otherwise, it will be ineffective |

The meeting concluded with Prof. Venkatesh and the IIITDM team thanking the expert panel for their valuable suggestions. Prof. Venkatesh also highlighted that the suggestion made by Prof. AG Rao to start the consultations with the design experts before speaking to the industry and engineering design experts, has indeed proven useful in grasping the essence of design-centricity. It was also indicated that post assimilation of the expert suggestions and consultations with other experts, a second round of consultation will be organized in 2 weeks to validate possible directions for IIITDM.

**IIITDM Design Spine: Consultation with Prof. Ravi B, IITB**

**Date: 08 Jul 2020, Time: 11-12:15 hrs, Google Meet**

**Participants:**

1. Prof. Ravi B, Dept of Mechanical Engineering, IITB, Founder BETIC and Head of Desai Sethi School of Entrepreneurship
2. Prof. G Venkatesh, Chairman, IIITDM BoG sub-committee
3. Dr Jayachandra Bingi, Member, BoG sub-committee, Asst Prof, Physics, IIITDM
4. Dr Karthicnarayanan, Spl Invitee, BoG sub-committee, Consultant, MaDeIT
5. Dr Sudhir Varadarajan, Convenor, BoG sub-committee and Dean (Design, Innov, Incub)

Dr Sudhir and Prof. Venkatesh welcomed Prof. Ravi and thanked him for sparing time for this important consultation on the future of design in IIITDM. Dr Sudhir then made a brief presentation on the current state, challenges, future aspiration, and possible programs (IIITDM-DesignSpine-Consultation-4Jul2020.pdf). The key suggestions made by Prof Ravi are summarized below.

1. **Strong case for persisting with the focus on design-centric engineering**
    a. There is a broad acceptance in Government that we are in the age of design (after IT/Biotech). Industry and academic institutions are also realizing this. However, it may not have yet manifested into the demand on the ground. There are a few cases such as IIT Hyderabad, where design talent is commanding better premium than CSE
    b. The changes triggered by the pandemic and the backlash against Chinese products does create an opportunity for Indian manufacturing companies and MSMEs (indigenization). Design is critical to realize such opportunities. Example of pocket transistor (Chinese brands)
    c. IIITDM already has “D” embedded in its name and must try to leverage this. It is important to convince all key stakeholders – faculty, students, parents, industry. And the location advantage (Chennai 600127 / STD code: 044) must be exploited in brand building. Increased outcomes in terms of patents, startups, and industry case studies will help develop the brand
2. **Improve engagement with industry and align with market requirements**
    d. IIITDM can target different types of companies – manufacturing companies like M&M, offshore centres of MNCs like GE, Engineering services divisions of Indian IT companies
    e. One way of targeting these companies is to offer certificate programs (2 day or 1 week) and then translate them into consulting opportunities. And involving in these projects will help faculty and students get exposure to real-world problems. The case studies created based on these projects are also helpful.
    f. Indian MSMEs differently abled when compared to MSMEs in countries like Germany. However, there are opportunities for Indian MSMEs to contribute to indigenization. Example, in ventilators there is an opportunity to indigenize the propulsion valves that may require strong inter-disciplinary design expertise – mechanical, electronic, manufacturability, aesthetics, etc. Today, there may be companies that either address mechanical aspects or electronic aspects. If IIITDM must explore opportunities to develop such integrated solutions. These can be powerful case studies that create strong visibility in the market

g. Government initiatives: The pandemic is driving attention towards 'essential sectors' including Healthcare, Agriculture, EduTech and services (logistics, sanitation, etc.). IIITDM can explore these opportunities

**3. Digital is going to create new opportunities**

h. Important for the institute to exploit the opportunities emerging from digital, pandemic, and geopolitical (US visa restrictions, anti-China sentiment)

i. Majority of IT talent pool sitting in India – creates new opportunities for development of local applications (replacing say Chinese apps). And this calls for better design (UI, UX) in addition to domain skills (coding and English).

j. New opportunities for automation in manufacturing / work and learning (pedagogy)

**4. Curriculum design and trade-offs**

k. Curriculum must be driven by the market requirements. It will good to speak to many professionals / companies – not only those who are currently engaged with the institute, but a much wider group.

l. It may also be useful to undertake a survey on specific points – what topics need to be covered, how it needs to be taught, etc. (IITB has done something like for the new entrepreneurship program)

m. Curriculum structure could be looked from two perspectives: (1) Basic Sciences, Engineering, Technology, Application/domain; or (2) a competency model - Knowledge, skills, mindset, network & resources.

n. Mini-projects and final project must be team-oriented and promote inter-disciplinary skills

o. It may be useful to look at trade-offs in the curriculum by starting with 50:50 and then move in different directions depending on the feedback from survey/ stakeholders and need.

p. Problem based learning could go top down - start with immersion in the problem context (outside the classroom) to understand the Function (requirements/ specifications). Then explore Form (by design), Fit (by manufacturing), and Behavior (by testing, check if it matches the original intended function) – thereby completing the circle/iteration. The sequencing of these components can be aligned with the industry. Apart from the design courses, the entrepreneurship and management courses are also important. Since IIITDM already has this, they can build on it.

**5. IPR**

a. IPR and commercialization (licensing) policy for corporates, startups may be articulated as part of this review.

b. Far more focus must be there on patents & startups. This will help improve visibility of the institute

**6. Input**

a. Leverage "Chennai" location in communications to attract better quality students

b. Separate entrance for admissions for experienced professionals (2 years after graduation) for masters programs. Mixing such candidates with regular students can enhance quality

**7. Creating a faculty pool & organization structure**

a. It is critical to have critical mass of faculty to drive the vision. Structure may be required, but whatever structure is adopted it must be loose and encourage collaboration.

b. Important to ensure that faculty engage in interdisciplinary work. Faculty may not sit dept wise, but random. Mutual discussions of different stream people must happen. Some of the

new IITs like IIT Gandhinagar, IIT Hyderabad, IIT Jodhpur are creating new physical infrastructure for collaboration among faculty – common lounge

c. It may be useful to consider appointing Professor of Practice for experienced industry professionals without PhD (20 years-experience at CXO level equivalent to Professor of Practice, and 10-15 years for Associate Professor of Practice)
d. Important to get many external experts (from various fields) to visit the institute on a regular basis to create a vibrant ecosystem

The meeting concluded with Prof. Venkatesh and the IIITDM team thanking Prof. Ravi for his valuable suggestions. It was also indicated that post assimilation of the suggestions and consultations with other experts, a second round of consultation will be organized in 2 weeks to validate possible directions for IIITDM.

**IIITDM Design Spine: Consultation with Prof. Srikant Vedantham, IITM**

**Date: 09 Jul 2020, Time: 11-12:00 hrs, Google Meet**

**Participants:**

1. Prof. Srikant Vedantham, Dept of Engineering Design, IITM
2. Prof. G Venkatesh, Chairman, IIITDM BoG sub-committee
3. Dr Jayachandra Bingi, Member, BoG sub-committee, Asst Prof, Physics, IIITDM
4. Dr Sudhir Varadarajan, Convenor, BoG sub-committee and Dean (Design, Innov, Incub)

Dr Sudhir and Prof. Venkatesh welcomed Prof. Srikant and thanked him for sparing time for this important consultation on the future of design in IIITDM. Dr Sudhir then made a brief presentation on the current state, challenges, future aspiration, and possible programs (IIITDM-DesignSpine-Consultation-4Jul2020.pdf). Prof. Venkatesh requested Prof. Srikant's views on three key questions: (a) the product and engineering design content for engineers; (b) demand and positioning of design-centric engineers (design minors); and (c) directions for M.Des/PhD programs. The key suggestions made by Prof Srikant are summarized below.

**1. Product and engineering design content for engineers**

a. There is a challenge in converting science-driven engineers (one problem, one right answer) to design-centric engineers (open-ended, multiple answers). There is a danger that people may end up as tinkerers instead of internalizing the discipline of dealing with open-ended problems
b. It will be useful if students in small teams are given a few mega challenges (full system design like EV, etc.) at the beginning of first year, and then all the courses are aligned to help them tackle these issues. This has been done in some institutions. It demands a high level of alignment among faculty / courses.
c. Reducing the content of product design as suggested in the consultation document might help. However, this must be compensated by increased the design component in engineering courses.
d. It is possible to add design component in the existing courses, syllabus, and work with existing textbooks. For instance while teaching fluid dynamics or control systems, one can start by introducing some real-world case studies in the beginning of the course; add 20%

weightage in the theory courses for design projects. If a lab is coupled with the theory course, it could be used to help students (in groups) to prototype/manufacture the design - 30% weightage in lab course can be for this type of activity; content from existing textbooks may have to be used in a non-linear way depending on the design issue being dealt with. It has been noticed even weaker students tend to do well in this approach. They understand the difficulty in prototyping. There may be a case to write a textbook for this type of approach.

e. It may be useful to mandate the design component in the course syllabus so that anyone delivering the course can follow it. The process can be adopted in a few courses to begin with and slowly extended to others.

**2. Demand and positioning of design-centric engineers**

a. It is worthwhile to give a choice for students with strong design-orientation to get a minor in design
b. Useful to promote a separate cohort that is more design-centric engineers (who can bridge the gap with product designers or can potentially take up product design roles), even though there appears to be no explicit value placed by the industry on such talent at this point. Industry might visit NID for industrial designer or IIT for engineer. It depends on the maturity in the industry and senior leadership mindset and may take time.
c. It will be useful to involve industry closely in the development of such cohort. And this could be combined with the PG/PhD programs that are industry oriented.

**3. Directions for PG/PhD programs**

a. It will depend on the faculty group and their interests. Need special mindset for interdisciplinary design work
b. Interdisciplinary design research must be encouraged. Institute could incentivize two faculty from different disciplines to jointly guide a student in an inter-disciplinary area

The meeting concluded with Prof. Venkatesh and the IIITDM team thanking Prof. Srikant for his valuable suggestions. It was also indicated that post assimilation of the suggestions and consultations with other experts, a second round of consultation will be organized in 2 weeks to validate possible directions for IIITDM.

**<u>IIITDM Design Spine: Consultation with Mr Narendra Ghate, Tata Elxsi</u>**

**Date: 09 Jul 2020, Time: 15-16:00 hrs, Google Meet**

**Participants:**

1. Mr Narendra Ghate, Chief Designer, Tata Elxsi
2. Prof. G Venkatesh, Chairman, IIITDM BoG sub-committee
3. Dr Jayachandra Bingi, Member, BoG sub-committee, Asst Prof, Physics, IIITDM
4. Dr Sudhir Varadarajan, Convenor, BoG sub-committee and Dean (Design, Innov, Incub)

Dr Sudhir and Prof. Venkatesh welcomed Mr Narendra Ghate and thanked him for sparing time for this important consultation on the future of design in IIITDM. Prof. Venkatesh requested Mr Ghate's views on three key questions: (a) the product and engineering design content for engineers; (b) demand and positioning of design-centric engineers (design minors); and (c) directions for M.Des/PhD programs. The key suggestions made by Mr Ghate are summarized below.

1. **Design could help develop creative confidence of engineers**
    a. Strong communication skills: One of the key things that designers are exposed to during their education is “to defend their designs in front of the jury”, handle tough questions on the why, what, how aspects relating to their concept. Creating opportunities for students to do this multiple times during their education helps designers develop strong communication skills (oral and presentation).
    b. Creative confidence: Designers are confident in taking key decisions when compared to engineers. Engineers need to develop this confidence instead of waiting for instructions or having all the details. This quality is critical to reduce delays.
    c. More emphasis on soft skills in design thinking: In the curriculum it may be useful to tilt that balance towards developing soft skills as opposed to getting the prototype/PoC right. The latter may be challenging and might discourage students from developing the well-rounded design thinking capability.
    d. Also, students must be encouraged to avoid the trap of being influenced by tools, and navigating towards what is easily achievable, but instead focus on what is desirable.
    e. In the industry, this problem is handled by separating the mockup/look and feel from the actual PoC. The mockup will be a simulation of the ideal solution, whereas the PoC may demonstrate one or two key features.
    f. It is important to de-emphasize the connection between aesthetics and design. For example, the two aspects of sketching – sketching/doodling to think vs sketching to communicate. The former aspect is an important soft skill for a designer
    g. Studio environment, learning through interaction with seniors, working in teams are critical to develop well rounded designers – who understand that they cannot do everything by themselves and need to collaborate, listen better, etc.
2. **Demand and positioning of design-centric engineers**
    a. There is demand for engineers with creative confidence. However, this may not be explicit at the entry level or in the recruitment process or show up in terms of entry level salaries. There is no doubt that engineers with design orientation can do well in their careers and add value to projects lot more. Case of Apple: Apple does not have more designers compared to Samsung. However, Apple has more engineers who understand design. That is their key differentiator.
    b. A young designer can demonstrate value to clients when he can combine his design expertise with an understanding of user/customer/market context. This is where some exposure to management courses might also help a designer. A design-engineer with this orientation will be valuable.
3. **Directions for PG/PhD programs**
    a. M.Des must be focused on developing design competence, not engineering. Exposure to photography and film making and similar diverse activities is important. Mixing it with engineering may not be desirable as it may end up producing rigid designers. A designer + engineer combo does not work at PG level. Engineers will need a lot of unlearning before they become good designers.
    b. Digital is an important area for designers – UI/UX. But, there are two levels here: (i) where the core framework is creatively designed, which could be 5% of the screens – this is where a designer is required; and (ii) where a template driven approach is applied

to standardize the remaining 95% of the application – this is where engineers with design exposure can play a role.

c. In an environment like Tata Elxi (design services), there is demand for project/program managers who can understand and manage design projects. There is a larger requirement of management competence for managing design teams. However, in organizations that develop their own products, there will be need for product managers. Typically, engineering managers or senior designers tend to get into these roles. Entry level engineers or PGs cannot add much value here.
d. Research in design can look at three avenues: (i) understanding of AI, interpretation of data, prediction or forecasting brands etc.; (ii) AI in design – automated creation of new adverts/presentation based on user preferences; (iii) ergonomics, anthropometric data, user engagement in autonomous cars etc.

The meeting concluded with Prof. Venkatesh and the IIITDM team thanking Mr Ghate for his valuable suggestions. It was also indicated that post assimilation of the suggestions and consultations with other experts, a second round of consultation will be organized in 2 weeks to validate possible directions for IIITDM.

**IIITDM Design Spine: Consultation with Ms Revathi Kant, Titan**

**Date: 10 Jul 2020, Time: 15-16:00 hrs, Google Meet**

**Participants:**

1. Ms Revathi Kant, Chief Design Officer, Titan Company Ltd
2. Prof. Venkatesh G, Chairman, IIITDM BoG sub-committee
3. Dr Raguraman, Member, BoG sub-committee
4. Dr Jayachandra Bingi, BoG sub-committee
5. Dr Sudhir Varadarajan, Convenor, BoG sub-committee and Dean (Design, Innov, Incub)

Dr Sudhir and Prof. Venkatesh welcomed Ms Revathi and thanked her for sparing time for this important consultation on the future of design in IIITDM. Dr Sudhir explained the background and requested Ms Revathi's views on three aspects: (a) design-centric engineering; (b) digital and design; and (c) focus areas for M.Des/PhD programs. The key observations made by Ms Revathi are summarized below.

**1. Case for design-centric engineering**

a. This is really the need of the hour. There is need for more engineers who understand design and can bridge the gap between design and engineering to speed up new product development. This gap is today handled through different coordination mechanisms and is not smooth. In countries like China we seem to notice a more seamless process.
b. IIITDM's design-centric engineers could be positioned to address this gap. It can be a differentiator. The institute must position itself effectively and reach out to the industry
c. While the basic knowledge of design thinking process can be given to all (exposure to form, function, behavior, structure), those chosen for a minor must be able to think like designers, which means a strong appreciation of the user/customer context

2. **Digital and Design**
    a. Interaction design is an area that has much demand. It requires visualization (design) and coding (engineering) skills.
3. **Directions for PG/PhD programs**
    a. The number of institutions that offer M.Des program is still relatively small. There is may be scope for IIITDM to enter this space
    b. The program can be open for all (students & experienced professionals; different disciplinary backgrounds – engineering, architecture)
    c. The program must emphasize the complete cycle of design and aim to produce a full-fledged designer who can conceptualize and realize. The institute could consider specialization in different domains depending on the market / gaps
    d. PhD program must be more focused on design and innovation. Design-management could be a good area for PhD research.

The meeting concluded with Prof. Venkatesh and the IIITDM team thanking Ms Revathi for her valuable suggestions. It was also indicated that post assimilation of the suggestions and consultations with other experts, a second round of consultation will be organized in 2 weeks to validate possible directions for IIITDM.

**IIITDM Design Spine: Consultation with Mr Kumaradevan, Saint Gobain**

**Date: 10 Jul 2020, Time: 14-15:00 hrs, Google Meet**

**Participants:**

1. Mr Kumaradevan G, Chief Information Office, Saint Gobain Inda Pvt Ltd
2. Prof. Venkatesh G, Chairman, IIITDM BoG sub-committee
3. Dr Raja B, Member, BoG sub-committee and HoD, Mech
4. Dr Karthinarayanan, Spl Invitee, BoG sub-committee
5. Dr Sudhir Varadarajan, Convenor, BoG sub-committee and Dean (Design, Innov, Incub)

Dr Sudhir and Prof. Venkatesh welcomed Mr Kumaradevan and thanked him for sparing time for this important consultation on the future of design in IIITDM. Dr Sudhir explained the background and requested Mr Kumaradevan's views on three aspects: (a) Saint Gobain's experience with IIITDM alumni; (b) digital orientation for engineers; and (c) scope for M.Des program. The key observations made by Mr Kumaradevan are summarized below.

1. **Experience with IIITDM alumni**
    a. The experience with IIITDM alumni has been good. About 7 have been recruited so far. In terms of both caliber and outlook, they are in the top bracket among all the engineers that Saint Gobain recruits.
    b. Saint Gobain is a process industry, and there are have not been many avenues to observe and comment on the design capability of IIITDM students. However, in the few cases where they were asked to build solutions for their plants (wireless hardware solutions), they have done a good job in terms of selecting appropriate components, working with vendors, engaging customers and delivering on time. IIITDM students have demonstrated the ability to assimilate process knowledge and collaborate with multi-cultural teams. Self-starting and entrepreneurial.

c. While they are good at managing the requirements and developing the prototype/solution, there is scope for improvement in final communication and presentation skills – presenting the case, and connecting with the audience
d. Aspects such as aptitude and peripheral vision of students are important for recruiters. The flexibility that appears to be there in the present curriculum (courses, internship, etc.) is useful. Happy with the type of projects that students presented during the industry open-house (EHIPASSIKO). These are similar to the ones they are pursuing as part of digitalization in manufacturing.
e. More depth in core engineering courses like VLSI or Fluid mechanics may be required for product / component manufacturing firms when compared to a process firm like Saint Gobain. A curriculum like smart manufacturing may be more suited for Saint Gobain's requirement.

**2. Digital orientation for engineers**

a. There is need for stronger data management capability among engineers (exposure to relational databases, tools like SQL, handling industry scale data, etc.)
b. Another area is data analytics and data visualization. Knowing basic things like which representation would be appropriate for which type of data is important. Also, UI/UX mainly for presenting data in HMI to user groups who are usually operators / shop floor workers – understanding the best way to communicate to such groups through different types of signs

**3. Directions for PG/PhD programs**

a. Industry may be more interested in experienced M.Des professionals than freshers. It may be a good idea to position it as an upskilling opportunity for experienced professionals

The meeting concluded with Prof. Venkatesh and the IIITDM team thanking Mr Kumaradevan for his valuable suggestions. It was also indicated that post assimilation of the suggestions and consultations with other experts, a second round of consultation will be organized in 2 weeks to validate possible directions for IIITDM.

**IIITDM Design Spine: Consultation with Mr Sathiya Seelan, Ashok Leyland**

**Date: 11 Jul 2020, Time: 11-12:00 hrs, Zoho Meet**

**Participants:**

1. Mr Sathiya Seelan, Head of Styling, Ashok Leyland Ltd
2. Prof. Venkatesh G, Chairman, IIITDM BoG sub-committee
3. Dr Raguraman, Member, BoG sub-committee
4. Dr Sudhir Varadarajan, Convenor, BoG sub-committee and Dean (Design, Innov, Incub)

Dr Sudhir welcomed Mr Sathiya Seelan and thanked him for sparing time for this important consultation on the future of design in IIITDM. Dr Sudhir explained the background and requested Mr Sathiya Seelan's views on three aspects: (a) industry demand for designers; (b) Case for MDes program; and (c) focus areas for design research. The key observations made by Mr Sathiya Seelan are summarized below.

1. **Strong demand for designers and design-centric engineers**
    a. There is good demand for designers, and firms are willing to pay premium for design talent. There is strong demand for UI/UX talent in Chennai / India. Ashok Leyland itself has a standing demand for 3-4 designers every year. However, right now it is a chicken and egg problem. While firms such as Ashok Leyland, Royal Enfield, Bharat Benz have in-house design teams in Chennai, other OEMs such as Ford, Isuzu, BMW, Hyundai, etc. have their design centers outside India. One of the reasons is the shortage of design talent in Chennai / India. This situation is likely to change given that Government is encouraging firms to setup their R&D activities in India, and firms such as Hyundai are considering setting up design studio in Chennai. Many more will follow suit. Important to create a network that helps design talent to connect with industry demand.
    b. Government is also encouraging starting design courses in premier institution, example B.Des in IITD. Right now there are very few institutions that produce good design talent (NIDs or IDC in IITB). Private institutions such as VIT, SRM may have such programs, but they are not comparable.
    c. A more fundamental reason why India needs design talent is that there are many problems in India that need localized and contextual solutions. For instance, there is a huge market for commercial transport. One of the key behaviors of truck drivers is to cook food inside the cabin, next to the engine. Solutions designed in Germany by Germans cannot factor such local requirements and will end up as force fits to a context and are never comfortable. While some work is happening UI/UX area, there is need for focus on interface between man and machine. Today product design, interior design, etc. is mostly done by engineers and graphic designers (from places like Loyola). This is not appropriate. Design will also be critical for revival of MSMEs. It is important to create awareness for market centric design.
    d. It is good to introduce a dose of design for engineers or even other disciplines at undergraduate level (or even offer a minor like in Stanford). Need to prepare engineers for design – beyond say mechanical engineering – this can help bridge the gap between designers and engineers, which is a key challenge in industry.
2. **M.Des Program**
    a. We must not mix up design and engineering in M.Des. We must bring-forth the creative and artistic ability of the designer. Salary is tied to this creative ability
    b. Important to have a strong selection process at entry level to identify people with creative background (with or without experience). The person must essentially be a dreamer, explorer, can make fearless entry into the future
    c. M.Des program must be generic and flexible (around Product Design) – students can be allowed to develop their specialization / interests in areas like UI/UX, mobility, leather, footwear, furniture, etc. – related to local industries. Can help bring industry people in these areas and cultivate a network
    d. Design in an online world will be a new challenge. Soft skills in design can be imparted through online interaction. However, there are aspects of design that need physical interaction/context.

3. **Focus areas for design research**
    a. Design research is different from design in engineering. Design is to simplify human life through a deep understanding of the context and localized solutions
    b. Design research must focus on delivering a new product (innovation) and has direct relevance to industry.
    c. Design research may focus on gaps where design can make a difference (related to 1.c). For instance, delivering experience design in areas like urban planning and transportation (direct policy impact)

The meeting concluded with Prof. Venkatesh and the IIITDM team thanking Mr Sathiya Seelan for his valuable suggestions. It was also indicated that post assimilation of the suggestions and consultations with other experts, a second round of consultation will be organized in 2 weeks to validate possible directions for IIITDM.

**IIITDM Design Spine: Consultation with Dr Shankar Venugopal, M&M**

**Date: 11 Jul 2020, Time: 16-17:00 hrs, Microsoft Teams**

**Participants:**

1. Dr Shankar Venugopal, VP & Dean, Mahindra Technical Academy, MRV, M&M
2. Prof. Venkatesh G, Chairman, IIITDM BoG sub-committee
3. Dr Binsu, Member, BoG sub-committee
4. Dr Raja B, Member, BoG sub-committee
5. Dr Sudhir Varadarajan, Convenor, BoG sub-committee

Dr Sudhir welcomed Dr Shankar and thanked him for sparing time for this important consultation on the future of design in IIITDM. Dr Sudhir then provided a quick background and requested Dr Shankar's views on (i) design-centric engineering, (ii) M.Des in design, and (iii) PhD in design. The key observations made by Dr Shankar are summarized below.

1. **Design exposure for engineering students with the objective of enhancing their creativity**
    a. Industry needs Innovative Engineers who can understand customers, define the right problems, and think out-of-the-box – hence there is a definite demand. Engineers who are Innovators and Design Thinkers are highly valued by the industry as they can create differentiated products and enable business growth. Industry needs engineers who have both technical depth and breadth – a mechanical engineer needs to know basics of electrical, electronic domains
    b. M&M has about 3000 engineers in their R&D centre in MRV (the vehicle design team sits in Mumbai). Recognizing the importance of design for engineers, M&M trains all their engineers in product design. This is done through a blended learning model that includes online courses with assessment, interactive sessions with practitioners, and a mini project guided by a mentor. This model (implemented for last 2 years) is helping a lot.
    c. There are two kinds of problems that engineers in M&M work on: (i) engineering problems where there may be one right answer, for example, optimizing strength of material. About 50% of problems fall in this bucket – a mainstream/regular engineer is

expected to handle this; (ii) design problems – where there is no one right answer. It may need an open mind, exploration, and iteration to arrive at a solution. These are the problems that have potential to deliver competitive advantage to the company. They require design-centric engineers. About 50% of problems fall in this category. An important capability of design-centric engineers is to understand customer needs (Rational, Emotional, Meaningful) and translate them into engineering problems. Design thinking skills are a must for this.

d. It may be difficult to cover the breadth and depth of both engineering and design in a four-year undergraduate program. This is only going to get more difficult in the future world of mobility, where a mechanical engineer is expected to have skills in electrical, electronics and computer programming and data analytics to participate in new product initiatives like Electric, Connected and Autonomous vehicles etc. M&M is piloting a couple of approaches with IITM and some younger IITs like Gandhinagar, Jodhpur to develop and attract the right type of talent for this emerging requirement. In IITM, Dr Shankar has piloted a model that engages a group of students across the four years – starting with problem identification in the first year, ideation in the second year, prototyping in the third year and business case preparation in the fourth year. These are facilitated through a series of workshops and involve interdisciplinary teams. Some of the ideas that have emerged from this process have translated into startups. This type of engagement over four years is important. IIT Jodhpur has piloted a product focused course. Example developing competency in EV by exposing engineers to inter-disciplinary design covering aspects of electrical, mechanical, chemical engineering and data analytics, etc. M&M has also found that students recruited from IISc CPDM seem to fit their requirement well. These students do a regular four year-engineering program and then work for two years before doing a two-year Masters program from IISc (in essence a 6+2 = 8 year maturing process).

6. **Post-Graduate Program – M.Des – Dual Degree Program with Design Specialization**
    a. 4 + 1 year (Dual Degree) allows IITDM to cover a full-fledged engineering core courses and offer Design courses right from the first year (this is not possible in a 4-year course)
    b. Introduce Industry specific electives in the 4th and 5th year
    c. Provide industry exposure to faculty and students – summer internships for students, mini sabbaticals in the industry for faculty, invite industry expert talks for all courses etc.
    d. Encouraging students to participate in hackathons will also hone the design skills of students. This kind of experience will be valued by the industry.
    e. Preparing students to tackle design challenges of MSMEs means getting them to deliver on day-one, when compared to a corporate environment where they may get some more time. This may also be similar in the case of startups.
7. **Ph.D Program in Design**
    a. Research in design is important, but it is better done in collaboration with industry. Identifying the right problems at the time of candidate selection will be useful - Industry problems in Interdisciplinary areas – cross-departmental Ph.D
    b. Co-Guide from the Industry
    c. Industry sponsored Ph.D (like Prime Minister Fellowships)
8. **Digital and Design**

a. Digital (data-insights-strategy-growth framework of M&M) is being used to address key challenges in (i) product development – system or architecture level decisions; and (ii) create space for engineers to iterate and do divergent thinking instead of converging to a solution quickly

**9. Guidance on curriculum design & implementation**

a. There must be enough flexibility in a four-year curriculum to allow students to explore rather than converging quickly to a discipline – choice based credits (Example of KidZania (Mumbai) that allows children to explore different career paths through role play).
b. Look at blended learning to help students to mix and match – students can take other discipline courses through online electives
c. It is important for faculty to practice what they preach. Can we practice Design Thinking in the way we design and offer the course – by giving enough space for exploration & experimentation – by allowing students to custom-design their learning in a step-by-step manner. Proximity to industry must be leveraged to identify and focus on specific segments, interact with experts, etc.
d. Dr Shankar offered to help from M&M perspective as well as provide connects to CII CTO forum so that IIITDM could also reach out to leaders from different industries/startups.

The meeting concluded with Prof. Venkatesh and the IIITDM team thanking Dr Shankar for his valuable suggestions. It was also indicated that post assimilation of the suggestions and consultations with other experts, a second round of consultation will be organized in 2 weeks to validate possible directions for IIITDM.

**IIITDM Design Spine: Consultation with Mr Abhik Chatterjee, BCG**

**Date: 13 Jul 2020, Time: 11-12:00 hrs, Google Meet**

**Participants:**

1. Mr Abhik Chatterjee, Managing Director, Centre for Digital in Oil & Gas, BCG
2. Prof. Venkatesh G, Chairman, IIITDM BoG sub-committee
3. Dr Binsu K, Member, BoG submittee
4. Dr Anand Lakshmanan, Member, BoG sub-committee
5. Dr Sudhir Varadarajan, Convenor, BoG sub-committee

Dr Sudhir welcomed Mr Abhik Chatterjee and thanked him for sparing time for this important consultation on the future of design in IIITDM. The key suggestions made by Mr Chatterjee are summarized below.

1. **Demand for designers and design-centric engineers**

a. In terms of career paths for engineers, we see four directions today: (i) IT & ITES – 40-50% seem to go in this direction, with CS background & others as well; (ii) Manufacturing sector – about 50% - here the expectation is that engineers have some digital exposure like mobile app development, integration, data; (iii) higher education and deep tech like Robotics, Additive Manufacturing – about 5-7%; and (iv) consulting

b. What industry/recruiters look for in engineers, in the order of priority: (i) problem solving ability / adaptability (that comes through design thinking); (ii) technical depth (that comes through engineering fundamentals); (iii) perseverance, discipline, etc. (that is in some ways reflected in the scores/grades)
c. Three broad types of requirements for design engineers and designers in the industry:
    i. Product design (full cycle) – in two types of industries (manufacturing / operations technology domain – example, ABB, Schneider, Ericsson) and deep tech (example, Apple, Samsung, Google). In the case of manufacturing, digital is more leveraged to drive efficiency – good demand for engineers with system design, integration and data capabilities. The demand in deep tech is hot, and largely untapped;
    ii. Strategic design or human centred or experience design – largely in B2C segment – requirement for understanding customers, customer analytics, ethnography and designing solutions (say Apps with relevant functionality and technology to enhance stickiness). Design houses/agencies like Accenture Interactive, Deloitte, etc. play a key role and hire talent in this space;
    iii. UI/UX – this has now become a commodity with several Tier-2/3/4 players

**2. Elements to be considered in curriculum design**

a. There is a strong case for a curriculum that is focused on (i) Product Design and (ii) Experience Design at UG and Masters levels. A set of mandatory or electives courses could be considered to cultivate these two capabilities right from 2nd year (for UG). UI/UX type of skills can be acquired by students themselves.
b. There needs to be a two-way relationship between the curriculum structure (skeleton of courses) and the experience that a student gains through that. Typical competency maturity model – beginner (2-3 yrs experience), proficient (3-6 years, with specialization in a domain), advanced (6-9 years), and expert (10+ years with 75% work done in that specific area)
c. There is good demand for designers with M.Des qualification. If IIITDM is considering launching a M.Des then it should look at the type of specialization that will be needed 3-5 years down the line. Example, Auto, Retail, etc.
d. Process focused design-centric engineers and creative designers will face challenges in adapting to the outcome-based models in business. Some orientation in terms of the industrial context / management aspects might help.

**3. Developing brand ambassadors, placement & internships**

a. Influencing behavioral change among students will be challenging. Will be useful to understand what drives students' behavior – type of work (good & novel), brand, hygiene factors (salary, etc.)
b. Developing students as brand ambassadors needs focused effort. It can be a 18-24 month journey starting from 1st or 2nd year, and cultivating a channel that attracts the right students and aligns them with specific / priority collaborators
c. Placement depends a lot on institute's value proposition – what type of students is the institute producing and how well it fits the requirement of a company (fit for

purpose). Industry partnerships may be required. Priority collaborations with industries, incorporating elements that are specific to their requirement

d. Students must have opportunity to have variety in their internship – say 2 internships (2-3 months each) so that they can explore and understand different paths. Scheduling them may not be a big issue.

The meeting concluded with Prof. Venkatesh and the IIITDM team thanking Mr Chatterjee for his valuable suggestions. It was also indicated that post assimilation of the suggestions and consultations with other experts, a second round of consultation will be organized in 2 weeks to validate possible directions for IIITDM.

**IIITDM Design Spine: Consultation with IIITDM Alumni (2014-15 batches)**

**Date: 29 Jul 2020, Time: 19:00-20:30 hrs, Google Meet**

**Participants:**

1. Prof. Venkatesh G, Chairman, IIITDM BoG sub-committee
2. Dr Raja B, Member, BoG sub-committee
3. Dr Karthicnarayan, Spl Invitee, BoG sub-committee
4. Dr Sudhir Varadarajan, Convenor, BoG sub-committee
5. Alumni members:

| Mechanical | CSE | ECE |
|---|---|---|
| • Pramod Nareshkumar, 2013, Product Manager, Addverb<br>• Sreyas Sriram, 2014, Associate Product Mgr, Atlan<br>• Balasundar, 2014, Engineer, Brakes India<br>• Sai Teja K, 2014, ONGC<br>• Teja Balu, 2014, Team member, Digital Transformation, Saint Gobain<br>• Rohan Sehgal, 2015, Team member, IS/Manufacturing, Saint Gobain<br>• Kruphakar G, 2015, Team Member, IS/Manufacturing, Saint Gobain<br>• Ashwinraj P, 2015, Design Engineer, MaDeIT<br>• Venkatesh V, 2015, Engineer, Mercedes Benz R&D India<br>• Rajkumar Reddy, 2015, Analytics Modeler, Ford India | • Vijay Raghavan, 2014, Software engineer, Trimble<br>• Sowbarnika, 2015, Software Engineer, Amazon<br>• Prathamesh N, 2015, Engineer, Mathworks | • Sushmitha Indurthi, 2014, Saint Gobain<br>• Varshitha Bhavani, 2015, Titan |

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|---|---|---|
| • Tejaswini Chatty, 2014, PhD Innovation Fellow at Dartmouth College<br>• Sai Prasath, 2015, Grad admit<br>• Rahul Narasimhan, 2016, Grad admit | • Aishwarya R, 2015, Grad student, Umass, Amherst<br>• Shiv Vidhyut, 2015, Grad student, Univ of Columbia, NY<br>• Nimhilkha, 2015<br>• Nitesh Narayana, 2016, Intern with AMD | • Abinaya S, 2015, PhD admit in Arizon State Univ<br>• Vaishnavi V, 2015, Grad student, KTH Royal Inst of Tech, Sweden<br>• Prabha Sahithi, 2016, admit in John Hopkins |

**Comments:**

1. I see a lot of potential in this plan, and don't want to be unnecessarily skeptical. But anticipating some of the problems and preparing for them would help. The different terms used for the three categories of products may confuse students/recruiters. How do you plan to handhold the Design++ students? How do you ensure that engineering faculty do not take retaliatory actions against Design++ students – we have seen this happen in the past; and placement for the rest 80%?- Tejasvini Chatty
2. Shouldn't we have different degree names to differentiate the products? We need to emphasize the industry readiness of IIITDM students in terms of their ability to collaborate in teams; There is lot of potential in the design-centric model, for instance, I am seen as an out of the box thinker – Pramod
3. The proposal appears to be over ambitious? B.Tech could be differentiated, but how would you compete in M.Des with leading institutions – Balasundar
4. Handholding the Design++ students and having partnerships will be key for the success of this model. This can be a huge risk as well. – Rohan Sehgal / Pramod
5. It is important to provide visibility to students very early – what they will get by joining the Design++ stream – Abinaya
6. I think it looks good as a model and I'm optimistic about the learning experience, not so much about the placement/job front which will be quite difficult to crack and needs a lot of strategic partnerships and alumni relationships to be made/re-discovered. I feel ultimately, the quality of practice courses, assignments and Thesis/research prompts will make the difference – good Tas/Lab staff, access to tools, maker spaces, practice in basic electronics. – Sreyas Sriram
7. This is a good initiative. But, implementation challenges need to be addressed. For instance, labs need to be open for longer periods (in the night) for students, newer electives for computer engg students – Aishwarya R
8. It is an interesting proposal. I think switching of Sociology before Systems Thinking makes a lot of sense to me. I noticed a lot of shift in how I consumed the coursework before and after sociology. The foundation is also a great addition, as we've discussed, there is a real need for an

unlearning aspect as soon as you come to the institute just to undergo that shift in mindset. Either way, I see two major challenges with the current proposal: Immersion (design studio, access to tools, TAs) and Handholding (partnerships, industry centric workshops, placement) – Prabha S

9. We see companies now teaching design thinking to fresh and experienced engineers. The design courses in the current curriculum have put us in a better shape when compared to others – Rajkumar Reddy
10. The current program has been beneficial to me. I started in the Verification division and quickly moved into the patents division within the company. The exposure to design goes beyond entry level in the company – it helps in career progression – Venkatesh V
11. I'm already satisfied with the existing curriculum and practice. What I primarily learned is the approach to patience, observation, flexibility, and exploration. These qualities facilitated looking for tools/techniques needed for the problem on my own, even though not taught at IIITDM. I feel the condition is like how a snake has to wait till it digests its food. Reflection from this learning will take time, but the success will be different from others. By considering the points above, kindly suggest to me the need for new steps/ bifurcations for BTech?. – Ashwinraj P
12. I am currently doing Masters in Columbia Univ, NY which is known for entrepreneurship. The exposure to design-centric engg has been extremely beneficial for me; Also, while working as a placement coordinator we noticed that recruiters such as Paypal, Mathworks were very excited to hear about the product & design focus our curriculum gives – Shiv Vidhyut
13. The feedback I got from IISc CPDM (for internship) was that students from IIITDM are far better at adapting to the problem solving requirement – Sai Prasath
14. Yes, we are able to adapt better. For instance, I am a mechanical engineer, but able to manage in-house software development team for shopfloor applications – Rohan Sehgal/Kruphakar
15. Even though I have a ECE background, I could quickly adapt to the requirements of a manufacturing company because I always saw myself as an engineer who can solve problems rather than in a disciplinary perspective; It will be useful to bring industry people to handle courses, that can bridge the gap – Sushmitha I
16. It is not just for industry, but the training in systems thinking, dealing with open-ended problems in the 3$^{rd}$ semester, has subconsciously helped in adapting to a research environment. How do you plan to select the people for Design++ stream – Abinaya S
17. I noticed that students with some entrepreneurial orientation grasped the design courses pretty well compared to others – Teja Balu
18. Companies like Mathworks which are now into Model based design etc. are highly interested in IIITDM type of curriculum – Prathamesh D
19. Students will have to start looking at how they can tie/explore their own problem statements in the context of these courses for the PDP sessions to start making sense and to form the deeper understanding of the subsystem level architecture designing competency we sorely lack. The point where top-down and bottom-up learning meets is the context. If they can take the context they are exploring into any other environment and play around with looking at their problem in that scenario, the problems will start taking better shape. – Prabha

20. Compatibility in timetabling will be important for offering the electives – Nitesh N
21. Will the program allow for field testing of concepts?– Sushmitha
22. Important to have some intersection between courses – repeat the concepts in higher courses to ensure learning – Sai Prasath
23. A lot of engineering design work today is moving into digital platforms. Would the new curriculum provide exposure to digital tools like MBD (Simulink)? – Venkatesh V
24. A mandatory internship at the end of every semester will help students get good experience, especially those entering the Design++ stream – Varshitha B

**IIITDM Design Spine: Consultation with IIITDM Faculty**

**Date: 30 Jul 2020, Time: 10:30-12:15 hrs, Google Meet**

**Participants:**

1. Prof. Banshidhar Majhi, Director, IIITDM
2. Prof. Venkatesh G, Chairman, IIITDM BoG sub-committee
3. Dr Binsu K, Member, BoG submittee
4. All BoG sub-committee members (except Dr Anand Lakshmanan and Dr Karthicnarayanan)
5. About 40+ faculty members
6. Dr Sudhir Varadarajan, Convenor, BoG sub-committee

**Comments:**

- This is a good initiative that will advance the unique mandate of IIITDM and it is the moral responsibility of all faculty to support this initiative – Prof. Majhi
- We started with one model in 2009 (thin coat), and then added more design content in 2014 (thick coat). Now is the time to take it further. Important to ensure that students don't lose interest in design after the 2$^{nd}$ semester and compare themselves with NITs and other mainstream institutions. All faculty and departments need to embrace design – Dr Raja
- We can include engineering design content in 30% of engineering courses. However, it may not be forced on all faculty.
- The separation into three categories is good. Also, it gives choice to students. This is a good outcome– Dr Sivaselvan, Dr Sadagopan; The term "Interdisciplinary design" in orgn name is appropriate -- Dr Senthil
- The proposal has come out nicely. Faculty can involve themselves in design work and this will open up opportunities for consultancy work. Implementation is important – Dr Noor
- This is a good proposal and I fully support it. The earlier proposal was also based on external consultation, however, it could not be translated into effective actions – Dr Tapas
- It is in the right direction. We should implement and see the results. And since the specialized focus is on less than 20% of students, it should be manageable. It is important to create a design studio to support student work – Dr Naveen
- There is no continuity in the presentation – no discussion on the past, present and future. People like Prof Krishnakumar should have been consulted. NIDs are not the right institutions to consult. Concerned that it will create another silo/shield. Design is everywhere, why should there be a separate organization – Dr Timmaraju

- Instead of School of Interdisciplinary Design, we should call it as Dept of Product Design and Innovation; and it should be responsible for producing patents; the design courses for UG program should be introduced after third year; PG program is fine; PhD program should be narrow and specialized – Dr Sreekumar
- Doing puja at home is not the same as visiting a temple. A separate entity will help create a new culture, and it will be an open organization – those interested can contribute – Prof Majhi

## Appendix-3: IIITDM Design Spine Courses & Syllabus

**Undergraduate (B.Tech – Six Core Courses)**

**Semester 1:**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Course Title** | **Foundation for engineering and product design** | **Course No** | | | | |
| **Specialization** | Design Spine (Semester 1) | Structure (LTPC) | 1 | 2 | 0 | 3 |
| **Offered for** | B.Tech & DD All streams | | | | | |
| **Prepared by (Faculty Name)** | | Status | Core<br>X | | Elective | |
| **Prerequisite** | None | To take effect from | 2020 Batch | | | |
| **Course Objectives** | The objective of this foundation program is to help students coming from +2 background to:<br>1. Unlearn limiting assumptions, risk avoidance, fear of failure<br>2. Awaken their senses & rediscover their creative selves<br>**3.** Experience the impact of design and technology in everyday objects | | | | | |
| **Course Outcomes** | At the end the course, the student should<br>● demonstrate qualities of immersion in a task;<br>● unlearn some limiting assumptions;<br>● comfortable with sketch thinking; and<br>● be excited by the potential of technology and design in improving lives; | | | | | |
| **Contents of the course (With approximate break up of hours)** | **Module-1: Induction: (1 week)**<br>● Know your context - physical and social;<br>● History of the place; the industrial ecosystem; institution<br>● Exercises to improve interaction; local visits;<br>● Unlearning activities; Start journaling<br>**Module-2: Learn to observe nature (9 hrs)**<br>● Observe wholes-parts (trees-leaves); variety of leaves; colors<br>● Document in a variety of ways - collage; sketch, paint, photograph, video<br>● Introduction to color theory - mixing of colors to get different shades<br>● Storytelling / Imagination<br>**Module-3: Learn to observe and explore objects (18 hrs)**<br>● Unbundle everyday objects, observe, reorganize<br>● Whole-part relations; System physics; | | | | | |

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| | ● Observe interplay of art, design, culture, technology in everyday objects<br>● Introduction to design sketching-1 (paper/pencil)<br>● Concepts of perspective drawing and product sketching.<br>● Explore variations on the form of chosen objects<br>**Module-4: Visualize and Realize 3D objects (15)**<br>● Crafts/Origami<br>● Realize designs with tools and materials (Clay modeling; Foam cutting; Laser cutting; Joining: Glues/Tapes)<br>● Introduction to digital sketching & 3D printing |
| **Text and References** | |
| | 1. Kevin Henry, Drawing for Product Designers, Laurence King Publishing, 2012.<br>2. Thomas C Wang, Pencil Sketching, John Wiley, 2002.<br>3. Koos Eissen and Roselien Steur, Sketching – The Basics, BIS Publishers,2011.<br>4. Wucius Wong, Principles of Color Design: Designing with Electronic Color, John Wiley and Sons Inc, 2nd Edition, 1996 |

**Semester 2:**

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|---|---|---|---|---|---|---|
| **Course Title** | **Sociology of Design** | **Course No** | | | | |
| **Specialization** | Design Spine (Semester 2) | Structure (LTPC) | 1 | 2 | 0 | 3 |
| **Offered for** | B.Tech & DD All streams | | | | | |
| **Prepared by (Faculty Name)** | | Status | Core<br>X | | Elective | |
| **Prerequisite** | Foundation Program | To take effect from | 2020 Batch | | | |
| **Course Objectives** | The objective of the course is to introduce engineering students to the importance of understanding the social context of technology and product design:<br>1. Observing the problem context and surfacing unstated user/customer needs / new product concepts,<br>2. Understanding people, team dynamics and working in multicultural / cross-functional / distributed teams. | | | | | |

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| **Course Outcomes** | At the end of the course, the students should be in a position to:<br>● Understand the need and the process of doing an ethnographic study<br>● Surface unstated needs and articulate the high level product requirements<br>● Connect with people, form teams and collaborate towards a common goal |
| **Contents of the course (With approximate break up of hours)** | **Module 1: Technology, Design and Society - [9 hrs]**<br>● Observe the way people interact with objects<br>● Understanding the relationship between people and a variety of objects<br>● Actor Network Theory; History of Technology and Design; 2-3 Case studies<br>● Discover your passion and domain of interest & network to identify partners<br>**Module 2: Understanding user/customer contexts [21 hrs]**<br>● Ethnography - immersion in a problem context<br>● Learning to observe - see and listen;<br>● Developing rich pictures; Gigamapping<br>● Introduction to signs and semiotic analysis<br>**Module 3: Understanding groups (multicultural/cross-functional teams) [12 hrs]**<br>● Learning team formation and dynamics through a movie;<br>● Introduction to sociological imagination - Functionalism, Conflict Theory, Symbolic Interactionism; Interaction Ritual Chains<br>● Values, culture, methods of engineers and designers and how they shape the quality of our lives;<br>● Group dynamics within organizations and across organizations and implications for innovation and change<br>Evaluation: Continuous assessment (40%); Final ethnography report (20%); End Semester (40%) |
| **Text and References** | |
| | 1. Trevor Pinch (Editors) (2012), The Social Construction of Technological Systems: New directions in the sociology and history of technology, MIT Press, Anniversary Edition<br>2. Wendy Gunn, Ton Otto and Rachel Smith (2013), Design Anthropology: Theory and practice, Bloomsbury<br>3. Adrian Forty (2014), Objects of desire: Design and society since 1750s, Thames & Hudson<br>4. Bernhard E Burdek(2015), History, theory and practice of product design, second revised edition<br>5. Keri Smith (2008), How to be an Explorer of the World: Portable Life Museum, Penguin Group |

**Semester 3:**

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|---|---|---|---|---|---|---|
| **Course Title** | **Systems Thinking for Design** | **Course No** | | | | |
| **Specialization** | Design Spine (Semester 3) | Structure (LTPC) | 1 | 2 | 0 | 3 |
| **Offered for** | B.Tech & DD All streams | | | | | |
| **Prepared by (Faculty Name)** | | Status | Core<br>X | | Elective | |
| **Prerequisite** | Sociology of Design | To take effect from | 2020 Batch | | | |
| **Course Objectives** | The objective of this course is to:<br>1. Introduce engineering students to a systemic (holistic and integrative) approach to product design in particular and problem solving in general<br>**2.** Explore the ambiguity, uncertainty prevalent in the fuzzy front-end of new concept development | | | | | |
| **Course Outcomes** | At the end of the course, the students will:<br>● Know how to focus on the right problems in a domain (opportunity / need identification)<br>● Apply frameworks & methods to model function, behavior and a high level product architecture | | | | | |

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| **Contents of the course (With approximate break up of hours)** | **Module 1: Introduction to product design (9 hrs):**<br>● The sequence of activities in introducing a new product into the market: Relation between engineering (detail design and manufacturing), product design & development and business (in Indian and global manufacturing sector).<br>● Framework to understand product and design process: Function-Behavior-Structure model; the need for inter-disciplinary view and use of systems/complexity concepts; similarities and distinctions in thinking about design (engineers vs designers vs entrepreneurs)<br>● Analysis of an existing product in chosen domain to appreciate the function, behavior, structure at part/component/sub-system/system level and over time (history)<br>**Module-2: Discovery & Diagnosis - modeling the problem (18 hrs)**<br>● Introduce methods for need identification; methods to translate needs to functional requirements; methods to extract the functional hierarchy (architecture) and overall purpose;<br>● Application of need identification techniques for new concept or redesign in chosen domain (1 week – structured methods), ethnography methods (2 weeks), function modeling (2 weeks); design reviews<br>**Module-3: High level Product Spec (15 hrs)**<br>● Methods to translate functional requirements into high-level requirement spec (SysML); and potential ways to create mock-ups / design realizations to communicate product ideas<br>● Concept presentation (form-Pretotype) using design sketching and realization tools (3D printing, clay modeling, CAD simulations etc.)<br>Evaluation: Continuous assessment (40%); Final ethnography report (20%); End Semester (40%) |
| **Text and References** | |
| | References:<br>1. Ulrich Karl, Eppinger Steven and Goyal Anita (2009), Product design and development, 4th edition, Tata McGraw Hill<br>2. Dan Norman (2010); Living with complexity, MIT Press<br>3. Nigel Cross (2008), Engineering Design Methods: Strategies for product design, 4th Edition, John Wiley & Sons<br>4. Andrew P. Sage and James E. Armstrong Jr. (2000), Introduction to Systems Engineering, Wiley<br>5. Stanford Friedenthal et al. (2014), A practical guide to SysML: The systems modeling language, Third Edition, |

**Semester 4:**

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|---|---|---|---|---|---|---|
| **Course Title** | **Smart Product Design** | **Course No** | | | | |
| **Specialization** | Design Spine (Semester 4) | Structure (LTPC) | 1 | 2 | 0 | 3 |
| **Offered for** | B.Tech & DD All streams | | | | | |
| **Prepared by (Faculty Name)** | | Status | Core<br>X | | Elective | |
| **Prerequisite** | Systems Thinking for Design | To take effect from | 2020 Batch | | | |
| **Course Objectives** | The objective of this course to help the students understand and apply the concepts of designing smart/intelligent products, i.e., information intensive and context sensitive | | | | | |
| **Course Outcomes** | At the end of the course, the students will:<br>1. Identify and define the right type of intelligent behaviour for a chosen product concept<br>2. Design high-level functional and component (structural) architecture for intelligent behaviour using appropriate metaphor and analogy<br>3. Evaluate and select the right AI technique for the proposed functional and component architecture and vice versa | | | | | |

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| **Contents of the course (With approximate break up of hours)** | **Module 1:** Introduction to intelligence behavior **(9 hours)**<br>● Definition of intelligence<br>● Dimensions of intelligence<br>● Levels of intelligence<br>**Module 2: Architecture for intelligent behavior (15 hours)**<br>● Functional arch for Intelligent Behavior (Intelligence and information intensity relation (equilibrium, amplification))<br>● Biological metaphors for cyber-physical systems (Bio-inspired adaptive systems (Positive and negative feedback)<br>● Theory of living systems (Self evolve, self improve, self-aware (e.g., self-configuration, -organization, -optimization) properties )<br>**Module 3: Selection of appropriate AI Techniques (18 hours)**<br>● Rule-based systems - Fuzzy inferencing - Artificial neural networks - Evolutionary computation -<br>● determine which type of intelligent system methodology would be suitable for a given type of application problem<br>● Demonstrate a working prototype, in the form of a major project work, the ability to design and develop an intelligent system for a selected application.<br>● Poster Session<br>Evaluation: Continuous assessment (40%); Final concept presentation (20%); End Sem (40%) |
| **Text and References** | |
| | References:<br>1. Donald A Norman (2007), The design of future things, Basic Books, New York<br>2. Dario Floreano and Claudio Mattiussi (2008), Bio-Inspired Artificial Intelligence: Theories, Methods and Technologies, MIT Press<br>3. Michael Negnevitsky (2005), Artificial Intelligence: A Guide to Intelligent Systems, Second Edition, Addison Wesley |

**Semester 5:**

<table>
<tr><td>Course Title</td><td>Entrepreneurship and Management Functions</td><td>Course No</td><td colspan="4"></td></tr>
<tr><td>Specialization</td><td>Design Spine (Semester 5)</td><td>Structure (LTPC)</td><td></td><td>0</td><td>0</td><td>3</td></tr>
<tr><td>Offered for</td><td>UG & DD (All Streams)</td><td rowspan="2"></td><td colspan="3" rowspan="2"></td></tr>
<tr><td>Prepared by (Faculty Name)</td><td></td></tr>
<tr><td>Prerequisite</td><td>None</td><td>To take effect from</td><td colspan="3">2020 Batch</td></tr>
<tr><td>Course Objectives</td><td colspan="6">The objectives of this course are:<br>1. To provide an exposure to the basic concepts of economics, organization and entrepreneurship / management<br>2. To help application of management techniques to analyze industry, competition and create a business plan</td></tr>
<tr><td>Course Outcomes</td><td colspan="6">At the end of the course, the students will learn how to<br>1. Understand the market & competition<br>2. Prepare a business case for the product concept</td></tr>
</table>

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| **Contents of the course (With approximate break up of hours)** | **Module 1: Introduction [6 hrs]**<br>● Introduction to Macro & Micro-economics; GDP, Supply-demand, Production possibilities curve, Division of labor and creation of value<br>● Evolution of organizations, industries and sectors, for profit and non-profit (economic, social and knowledge perspectives)<br>● Role of Entrepreneurs and Managers in value creation<br>**Module-2: Defining Strategy and Organization [15 hrs]**<br>● Understanding industry dynamics & competition (Porter's Framework)<br>● Understanding the industry value chain and firm positioning; and strategy<br>● Types of organization structures (product, functional, matrix, global)<br>● Typical organizational functions (R&D, Marketing & Sales, HR, Operations)<br>**Module-3: Mobilizing Resources [15 hrs]**<br>● Financial management (Sources of funding, how to read a P&L, balance sheet, Product Costing & Investment Decisions)<br>● Human resource management<br>● Global sourcing and supply chain management<br>● Intellectual Property & Knowledge Management<br>● Management Information & Decision Making<br>**Module-4: Ensuring Legal and Regulatory compliance [6 hrs]**<br>Evaluation: Continuous assessment (40%); Business Plan (20%); End Semester (40%) |
| **Text and References** | |
| | ● Michael Porter (2008), On competition, Updated and Expanded Edition, HBS<br>● Peter F Drucker (2006), The Practice of Management, Harper Collins, NY<br>● Eric Ries (2011), The Lean Startup, Portfolio Penguin |

**Semester 6:**

<table>
<tr><td>Course Title</td><td>Prototyping & Testing</td><td>Course No</td><td colspan="4"></td></tr>
<tr><td>Specialization</td><td>Design Spine (Semester 6)</td><td>Structure (LTPC)</td><td>1</td><td>2</td><td>0</td><td>3</td></tr>
<tr><td>Offered for</td><td>UG & DD (All Streams)</td><td rowspan="2"></td><td colspan="2" rowspan="2"></td><td colspan="2" rowspan="2"></td></tr>
<tr><td>Prepared by (Faculty Name)</td><td></td></tr>
<tr><td>Prerequisite</td><td>None</td><td>To take effect from</td><td colspan="4">2020 Batch</td></tr>
<tr><td>Course Objectives</td><td colspan="6">The objective of the course is to help students develop rapid prototyping skills and realize a minimum viable product</td></tr>
<tr><td>Course Outcomes</td><td colspan="6">Students will develop skills in rapid prototyping; project management and focusing on delivering outcomes</td></tr>
<tr><td>Contents of the course (With approximate break up of hours)</td><td colspan="6">1. Minimum viable product plan (3 hours)<br>● Markets and Needs<br>● Business Goals<br>● Key features<br>2. Core Product Architecture (6 hours)<br>● Storyboarding of the product core.<br>● Framework for mechanical , electronics and computing paradigm<br>3. Design for Manufacture & Assembly (3 hours)<br>● Manufacturing Process: Form<br>● Assembly constraints : Fit<br>4. Developing the Proof of Concept (30 hours)<br>● Build<br>● Assemble<br>● Iterate<br>● Validate<br>● Pitch<br>Evaluation: Continuous assessment (80%); Final PoC demo (20%)<br>2 one-day hackathons may be organized during this period (one weekends) to accelerate PoC development</td></tr>
</table>

| | |
|---|---|
| **Text and References** | |
| | 1. How to Solve Big Problems and Test New Ideas in Just Five Days by **Jake Knapp, John Zeratsky, Braden Kowitz**<br>2. The Total Inventors Manual :Transform Your Idea into a Top-Selling Product by **Sean Michael Ragan**<br>3. Prototyping and Modelmaking for Product Design by **Bjarki Hallgrimsson**<br>4. Bringing a Hardware Product to Market: Navigating the Wild Ride from Concept to Mass Production by **Elaine Chen** |

## Appendix-4: M.Des Curriculum (Courses & Objectives) (Including the Electives for Design++ and Dual Degree); Detailed syllabus-WIP

**Semester 1**

| Course | Objectives |
|---|---|
| Induction and Foundation (two weeks), (1 credit) – Core | This is going to be a mandatory two weeks course for anyone joining the MDes program at IIITDM. The objective of this course is to help students coming from different background to:<br>● Unlearn limiting assumptions, risk avoidance, fear of failure<br>● Awaken their senses & rediscover their creative selves<br>● Experience the impact of design and technology in everyday objects. |
| Design Culture and Society (3 credits) – Core | This course focuses on providing insights into understanding of the history and theory of modern design, within its changing cultural and social contexts, and their continuing relevance to design practice today.<br>● Students are able to consider cultural behaviour such as material culture, design history, cultural anthropology and philosophy of technology during the design process and deliver the complete concept design of a product. |
| Design Theory and Methods (3 credits) – Core | This course will offer Design Theory and Methodology as a framework that integrates theoretical concepts from different fields, which all contribute to the process and thus to the product. This course will examine how designers conduct research in order to produce relevant and meaningful products and services that are appropriate for specific audiences, cultures, and contexts.<br>● Students will learn how to apply a range of research methods via fieldwork to their everyday design practice including developing and using ethnographic strategies, personas, interviewing, and iterative design processes, among others.<br>● Students work in teams, putting theory into action, which informs collaborative design practice. |
| Materials and Processes (3 credits) - Core | This course is to train students on design-oriented materials selection. The course introduces analytical tools and methods for qualified materials selection and principles for material design for typical applications with respect to temperature stability, thermal and electrical conductivity, strength, toughness and chemical resistance, etc.<br>● Students should be able to understand the basics of design-oriented materials selection for engineering applications;<br>● Students are able to work with and apply systematic and objective materials selection based on the physical principles, role of |

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| | geometrical aspects and mechanical properties. |
| Industrial Design Sketching-1 (3 credits) – Core | This course is aimed to introduce advanced sketching and 3D modeling concepts using digital tools and techniques with aesthetic sense to provide hands on training to the students. Students will acquire drawing and modeling skills that are required to communicate the design ideas/concept products using computer-based tools. |
| Product Communication and Presentation (2 credits) – Core | Objective of this course is to teach presentation techniques and portfolio work for designers/students to showcase their product knowledge, stand out and stay competitive. |
| Design Studio-1 (2 credits) – Core | Introduction to basic design and prototyping tools |
| Design of Cyber-Physical systems /Smart Products (3 credits) – Core | This course introduces students to the conceptual design of smart products / cyber-physical systems. The theme of the course is on the interplay of practical design with formal models of systems, including both software components and physical dynamics<br>● Students will apply concepts learned in lectures to programming the required control systems for their chosen project as a part of the concept design project course. |

**Semester 2**

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| Digital Product Sketching and Visualization (3 credits) – Core | Introduce the advanced sketching and modeling concepts needed for product design. Hands-on training in computer-based sketching and 3D modeling tools. |
| Design Studio – 2 (2 credits) – Core | Introduction to advanced design and prototyping tools |
| Human Factors and Ergonomics (3 credits) – Core | Introduction to human factors; physical, cognitive, occupation and biomechanical aspects in design. Anthropometry; Ergonomic methods to analyze products, product-service systems and built environments; usability constraints, contextual constraints; |
| Interaction Design (3 credits) – Core | Smart devices (mobile phones, PDAs, tablet computers), smart products (car, navigation) and smart environments (ambient intelligence) are enabling new services that require innovative interfaces. This course focuses on the study, design, development and evaluation of novel user interfaces, interactive systems and services. Upon completion of this course, students will<br>● Have knowledge of human factors, usability and its critical importance, as well as cognitive issues related to user behaviour<br>● Be able to recognize, analyze, compare and apply various usability standards (heuristics) and methods for mental workload assessment and understanding human error<br>● Be able to discuss requirements for the design of user interfaces in digital media with regards to human factors and end-users needs.<br>● Be able to analyze and assess the appropriateness of various methods for mental workload assessment.<br>● Be able to perform independent practical work in understanding human error and usability.<br>● Be able to link the mental workload to interaction design. |
| Visual Communications (3 credits) – Core | Visual thinking and communications skills are developed and exercised in the context of solving design problems. Exercises for the mind's eye. Rapid visualization and prototyping with emphasis on fluent and flexible idea production. The relationship between visual thinking and the creative process. |
| Design for Quality and Reliability (3 credits) - Core | The design phase is crucial for product quality improvement since design quality is a key determinant on the final product quality. Design quality means that design requirements reflect the voice of the customer (VoC) or the demands of the market. Manufacturing quality means that the end-product conforms to the product design requirement and specification, where it is the conformance to quality. The first part of the |

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| | course will provide insights into the quality relationship model showing interpretation of the leveraged relationships between design, manufacturing and product quality, and explain the uses and limitations of the model.<br><br>Design for reliability ensures that products and systems perform a specified function within a given environment for an expected lifecycle. Hence, the second part of the course will talk about design for reliability concepts, bathtub curve, safety critical design, probability analysis of reliability issues, repairable and non-repairable systems. At the end of the course, students will be able to:<br>● Apply the various tools and techniques used to improve the product quality at the design phase.<br>● Construct QFD, FMEA and fault tree analysis and also to perform reliability analysis for the chosen product. |
| Strategic Management of Design and Innovation (3 credits) – Core | The objective of this course is to help designers understand the innovation challenge from the entrepreneur and manager's perspective, i.e., both at a strategic level and organizational level. In other words, how do entrepreneurs and managers build organizations and ecosystems that can continuously generate and commercialize innovations, and how can they protect and enhance competitive advantage. At the end of the course, students will have a familiarity with:<br>● Topics in strategic innovation management, such as innovation networks, idea brokering, open innovation;<br>● Innovation processes and structures such as R&D team, the pros and cons of various R&D organizational structures, and challenges of innovation in large and small firms;<br>● Skills to identify, evaluate, and resolve a variety of issues relating to poor innovative performance in large firms as well as entrepreneurial firms. |
| Model Based Design - 3 credits - Elective | This course brings together the concepts from across digital manufacturing and design, forming a vision in which the geometry of a product is just one way of describing it. MBD is where the model resulting from the evolution of system requirements, design, analysis, verification and validation activities is the focus of design and manufacturing.<br>● Students will gain an understanding of systems engineering, the model-based approach to design and manufacturing, the Digital Twin, and a roadmap toward a model-based enterprise.<br>● Students will be able to explain the value and expectations of systems engineering and model-based systems engineering, and the underlying motivations and opportunities represented by a model-based enterprise. They will develop the knowledge necessary to perform a baseline assessment of an organization’s potential to |

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| | leverage MBD. |
| Design Research Methodologies - 3 credits – Elective | DRM teaches a methodology for carrying out research into design. Its steps are to clarify research success; to understand relevant phenomena of design and how these influence success; to use this to envision design improvement and develop proposals for supporting improvement; to evaluate support for its influence on success; and, if unacceptable, to modify, support, or improve the understanding of success and its links to the phenomena of design. After successful completion of this course students are able to:<br>● recognize the difference between a conceptual and a technical research design and explain the importance of formulating a research objective and a research issue;<br>● compare the experimental, cross-sectional and case study research designs and apply the strategies for random and non-random sampling;<br>● infer data collection by means of questionnaires/interviews, observation and content analysis;<br>● identify the basics of data analysis in quantitative and qualitative research and formulate an adequate research objective and an adequate set of research questions with a proper technical research design for an experimental study, a cross-sectional study and a case study;<br>● develop an operationalization for one-dimensional and multi-dimensional concepts. |
| Mathematics for Designers (3 credits) – Elective | Many people who pursue artistic fields believe that the skills required for product design simply have no relationship to the skills required for mathematical pursuits. Individuals fail to realize that mathematics is an integral part of design. In fact, concepts such as patterns, symmetry, positive and negative space, arrangement, and sequence that are so important to design. For example, fractals are repeating geometric patterns that combine to form a design. Designers use fractals from clothing design to web design. Similarly, fibonacci series found several applications in design. Hence, this course is going to build confidence and fluency in applying mathematical skills in the context of design work. Students will practice measuring and calculating the areas and volumes of manufactured objects and proposed designs. They will use trigonometry to develop 2D and 3D scale drawings and will use statistics to inform designs, for example when using ergonomic data. They will explore the geometry of curves and will be introduced to the use of mathematical symmetries, sequences and patterns as design tools. Basic matrix operations and linear algebra are a foundation for design work involving software algorithms. |
| Summer Internship (5 credits) - Core | This summer internship is to develop and improve business skills in communication, technology, quantitative reasoning, and teamwork in an |

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| | industrial environment and also to explore the potential design projects as their final project. It helps to meet professional role models and potential mentors who can provide guidance, feedback, and support on their final year design projects. |

**Semester 3:**

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| Bio-inspired Design (3 credits) – Core | This course intended to give the student the exposure of principles and perspectives of bio-inspired design and train them to apply the bio-inspired methodologies for innovation.<br>● Students will be able to describe various methods for creative design and identify working principles of biological phenomena - explain their construction, motion, and/or processing mechanisms - formalize the essence of these mechanisms in models -derive non-conventional design principles from these models.<br>● Students will be capable of implementing these design principles in innovative technical devices - summarize the transition process from the biological to the mechanical domain - present their design in drawings and working models. |
| Sustainable Product and Service Systems (3 credits) – Core | This course helps students to explore sustainability as a business opportunity for developing innovative products and services. It will focus on consumer needs related to sustainability, willingness to pay for these needs, and the innovative processes necessary to create sustainable solutions. On successful completion of this course, students will be able to:<br>● Understand and critically analyze current realities, opportunities, and structural issues in sustainability across a range of organizations.<br>● Manage and evaluate insight-driven research as a precursor to sustainability- driven innovation.<br>● Map sustainability-driven offerings in the market to evaluate the competitive landscape and find strategic opportunity.<br>● Design sustainability-centric product and service offerings around identified and tangible market needs.<br>● Create, iterate, and evaluate initial beta offerings to understand viability. |
| Simulation-Driven Design and Innovation (3 credits) - Elective | Simulation technologies were primarily considered as validation tools, used to verify the performance of components and systems and rarely influenced the product design. It highlighted problems and passed reports back for modifications that approach served its purpose, but as the technologies have become more sophisticated and able to deliver results more quickly, the scope to use simulation earlier in the design cycle and deliver design direction in line with the pace of product |

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| | development programs is now enabling manufacturers to realize significant time and cost savings. No longer is simulation a tool to 'okay' a design. It is now a driver of innovation, allowing design engineers to propose optimised design solutions that exhibit the best compromise of multiple engineering functions and constraints. Thus, this course is aimed at teaching simulation-driven design philosophy and vision of where simulation should play a key role in the product development process. At the end of the course,<br>● Students will be able to understand the value of simulation driven design during the conceptualisation phase.<br>● Students will be able to build generative design and topology optimisation for better concept designs.<br>● Students will be able to modify the geometry to iterate and explore new design paths in a virtual domain. |
| Design of Electric Vehicle Systems (3 credits) - Elective | This course will provide students with a broad technical knowledge and practical expertise of hybrid and electric vehicle (HEV) technologies, analysis, design, component selection and sizing at both system and vehicle level. On successful completion of this course, students will be able to:<br>● Analyse the different powertrain architecture options and select the appropriate solutions within realistic performance and commercial constraints.<br>● Evaluate various technology options for (electrical and mechanical) energy generation, storage, transmission, and management for a HEV, and be able to select between different technologies relative to a given vehicle application and overall system design.<br>● Size various HEV sub-systems, within the context of various vehicle constraints, such as performance, fuel economy and packaging.<br>● Employ and experiment rapid control prototyping techniques to design and validate HEV high-level and low-level control systems.<br>● Carry out performance evaluations of a HEV and its subsystems using simulations. |
| Design of Biomedical Devices and Systems (3 credits) - Elective | The course teaches fundamental approaches, methods and tools related to the design of biomedical devices, experiences, systems and services with a focus on users and context of use. Also, this course brings together candidates from a range of fields including design, health care, engineering and business, and prepares graduates to play a leading role in the development of emerging medical devices. It will cover topics ranging from basic medical science and bioinstrumentation to product design and human factors. At the end of the course,<br>● Students learn to conduct human centered contextual research, extract meaningful insights, create and visualise concepts, and develop and evaluate prototypes, all in the context of the complex and highly regulated world of medical device design.<br>● Students are able to design from a human centred perspective while |

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| | gaining a deep understanding of the underlying science, technology, materials and manufacturing processes which underlie medical device design and development. |
| Design of non-invasive products (3 credits) - Elective | The objective of the course is cultivate the skill of appreciating the communication between the system and environment and develop suitable principles such as acoustical, photonic, optical, electronic, for non-invasive monitoring in human or machine. |
| Embedded Systems and Kinetic Art (4 credits) – Elective | The objective of the course is to help students understand the principles of developing dynamic (kinetic) artistic structures through an appreciation of sculptures, designs and leveraging electronic components such as sensors, controllers, actuators and programming |
| Game Design and Development (3 credits) - Elective | This course is an introduction to the theory and practice of the process of designing games and playful experiences. Students are familiarized with methods, concepts, techniques, and literature used in the design of games. The strategy is process-oriented, focusing on aspects such as rapid prototyping, play testing, and design iteration using a player-centered approach. After completing the course the student should be:<br>• Familiar with the emergence of the academic study of design methods and game design.<br>• Able to select and apply appropriate methods and techniques during different stages of the development cycle.<br>• Able to structure and conduct a game design project from conceptualization to playable prototype.<br>• Proficient in contributing to the collaborative learning and development processes. |
| Animation Design (3 credits) – Elective | Animation is a field of concept art and is a piece of motion design that is created to convey a particular idea before it is put into a real product. In user interfaces design, conceptual animation may be found in various concepts for interactions, transitions, manipulations with controls, animation marking the feedback from the system etc. Hence, this course provides the essential knowledge of digital animation techniques, demonstrating the processes necessary to develop animation at a professional level, from creation to production. On successful completion of the course, students will be able to:<br>● understand the process of creating a digital animation;<br>● create a drawing using motion graphics techniques;<br>● write a storytelling for animation;<br>● understand the principles of 2d and 3d animation. |

**Semester 4:**

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| Design Project – (20 credits) | Design Project Part II allows students to apply research, capabilities, and knowledge gained over the last three semesters. Students are required to submit their design output and a mandated thesis document. Students are mentored during this final project and go through seminars to get feedback from faculty and peer groups. |
| Elective-6 (3 credits) | |

**Annexure 3**

# Eligible Students - Total – 303

## LIST OF STUDENTS ELIGIBLE FOR DISTINCTION

| S.No. | Roll No. | Name | CGPA | Degree |
|---|---|---|---|---|
| 1 | COE16B001 | ANEESH D H | 9.44 | B Tech |
| 2 | COE16B006 | BALMOORI PRAGNYA | 9.08 | B Tech |
| 3 | COE16B008 | BONDU VENKATA KUMARA VAISHNAVI | 9.17 | B Tech |
| 4 | COE16B018 | HARINI R | 9.68 | B Tech |
| 5 | COE16B019 | HRISHIKESH. P.M | 9.33 | B Tech |
| 6 | COE16B025 | MANTRIPRAGADA ANJANI SANKAR | 9.24 | B Tech |
| 7 | COE16B034 | SHIVESH M M | 9.18 | B Tech |
| 8 | COE16B037 | VALLABHANENI SAI PHANI TEJA | 9.01 | B Tech |
| 9 | COE16B039 | YANALA VENI MADHAVI | 9.03 | B Tech |
| 10 | COE16B041 | GORANTLA MEGHANA | 9.4 | B Tech |
| 11 | COE16B042 | M VINITHA | 9.29 | B Tech |
| 12 | COE16B043 | MEGHANA REDDY TELLURI | 9.08 | B Tech |
| 13 | COE16B044 | S AJAY NARAYANAN | 9.61 | B Tech |
| 14 | EDM16B001 | ABIRAMI A | 9.13 | B Tech |
| 15 | EDM16B015 | JEEVA KESHAV S | 9.15 | B Tech |
| 16 | EDM16B016 | K BHARATI | 9.27 | B Tech |
| 17 | EDM16B041 | DAWARE PRATHAMESH MAHIPATI | 9.03 | B Tech |
| 18 | MDM16B022 | PAVITRA BHAGAVATULA | 9.02 | B Tech |
| 19 | MDM16B025 | RAHUL NARASIMHAN R | 9.18 | B Tech |
| 20 | MDM16B038 | Y ADITYA VARMA | 9.73 | B Tech |
| 21 | MSM16B001 | AILONE AKANKSHA | 9.03 | B Tech |
| 22 | MSM16B015 | KARAMBOR CHAKRAVARTY SRIYA | 9.22 | B Tech |
| 23 | MSM16B035 | THIPPABATTUNI ANTONY ROHIT | 9.04 | B Tech |
| 24 | CED15I002 | R MUKESH | 9.04 | DD |
| 25 | CED15I007 | GOVIND K P | 9.24 | DD |
| 26 | CED15I009 | MANASA KANDIMALLA | 9.19 | DD |
| 27 | CED15I014 | VIDHATHRI | 9.47 | DD |
| 28 | CED15I021 | ANMOL GUPTA | 9.33 | DD |
| 29 | CED15I024 | V DIVYA | 9.17 | DD |
| 30 | CED15I029 | PRATHAMESH A DEGWEKAR | 9.16 | DD |
| 31 | CED15I039 | V.K. DINGU SAGAR | 9.22 | DD |
| 32 | CED15I040 | V.AKASH | 9.29 | DD |
| 33 | CED15I042 | G.SARAVANA BALAJI | 9.44 | DD |
| 34 | CED15I043 | EASHAN DASH | 9.34 | DD |
| 35 | ESD15I010 | S PRANAV KUMAR | 9.28 | DD |
| 36 | ESD15I020 | S SANJANA | 9.21 | DD |
| 37 | EVD15I007 | F KIRAN ROBERT | 9.44 | DD |
| 38 | EVD15I016 | VYSHAK NATH C A | 9.02 | DD |
| 39 | MFD15I004 | POTNURU HEMA PRANEETHA NAIDU | 9 | DD |

| 40 | MPD15I019 | RATNANJALI TIWARI | 9.31 | DD |
|---|---|---|---|---|
| 41 | CDS18M001 | MEDARA SREENIVASULU | 9.04 | M Tech |
| 42 | CDS18M003 | GOWRI MURALEEDHARAN B | 10 | M Tech |
| 43 | CDS18M006 | SANJANA PAUL | 9.29 | M Tech |
| 44 | CDS18M008 | B VENKATA RAGHU RAM | 9.08 | M Tech |
| 45 | CDS18M009 | RAKSANTA S | 9.13 | M Tech |
| 46 | EDS18M002 | THUMPIRI REDDY MANASA | 9.05 | M Tech |
| 47 | EDS18M010 | A.SRIVANI | 9.05 | M Tech |
| 48 | EDS18M013 | ARTHI R | 9.89 | M Tech |
| 49 | MDS18M001 | VALECHA DHEERAJ KAILAS | 9.09 | M Tech |
| 50 | MDS18M002 | BHAVSAR DIVYAKUMAR ASHIT | 9.75 | M Tech |
| 51 | MDS18M003 | CHAVAN AJITKUMAR ANKUSH | 9.21 | M Tech |
| 52 | MDS18M006 | AVINASH MOHAN M | 9.47 | M Tech |
| 53 | SMT18M003 | SHASHWAT PANDEY | 9.33 | M Tech |
| 54 | SMT18M007 | VISHAK P M | 9.89 | M Tech |

## LIST OF STUDENTS ELIGIBLE FOR BACHELOR OF TECHNOLOGY (Honours)

| S.No. | Roll No. | Name | CGPA | Degree |
|---|---|---|---|---|
| 1 | COE16B001 | ANEESH D H | 9.44 | B Tech |
| 2 | COE16B018 | HARINI R | 9.68 | B Tech |
| 3 | COE16B019 | HRISHIKESH. P.M | 9.33 | B Tech |
| 4 | COE16B025 | MANTRIPRAGADA ANJANI SANKAR | 9.24 | B Tech |
| 5 | COE16B041 | GORANTLA MEGHANA | 9.4 | B Tech |
| 6 | COE16B042 | M VINITHA | 9.29 | B Tech |
| 7 | COE16B044 | S AJAY NARAYANAN | 9.61 | B Tech |
| 8 | EDM16B001 | ABIRAMI A | 9.13 | B Tech |
| 9 | EDM16B015 | JEEVA KESHAV S | 9.15 | B Tech |
| 10 | MDM16B025 | RAHUL NARASIMHAN R | 9.18 | B Tech |
| 11 | MDM16B038 | Y ADITYA VARMA | 9.73 | B Tech |
| 12 | MSM16B015 | KARAMBOR CHAKRAVARTY SRIYA | 9.22 | B Tech |
| 13 | CED15I042 | G.SARAVANA BALAJI | 9.44 | DD |
| 14 | ESD15I010 | S PRANAV KUMAR | 9.28 | DD |
| 15 | ESD15I020 | S SANJANA | 9.21 | DD |
| 16 | EVD15I007 | F KIRAN ROBERT | 9.44 | DD |
| 17 | MPD15I019 | RATNANJALI TIWARI | 9.31 | DD |

## LIST OF STUDENTS ELIGIBLE FOR DEGREE

## B. Tech. in Computer Engineering

| S.no. | Roll No. | Name | CGPA |
|---|---|---|---|
| 1 | COE16B001 | ANEESH D H | 9.44 |
| 2 | COE16B002 | ANKALUGARI RANGAHARSHAVARDHAN | 8.42 |
| 3 | COE16B003 | ARUN NARAYANAN H | 8.92 |
| 4 | COE16B004 | ATLURI BHASKARA TEJA | 8.14 |
| 5 | COE16B005 | AVULA THOMAS | 6.47 |
| 6 | COE16B006 | BALMOORI PRAGNYA | 9.08 |
| 7 | COE16B007 | BEJJENKI SPANDANA | 8.33 |
| 8 | COE16B008 | BONDU VENKATA KUMARA VAISHNAVI | 9.17 |
| 9 | COE16B011 | CHERUKURI GOWTHAMI | 8.75 |
| 10 | COE16B012 | D SAI CHARAN | 7.94 |
| 11 | COE16B013 | DANDYALA SADWIKA | 8.38 |
| 12 | COE16B014 | DEVA SUSHMITHA | 8.67 |
| 13 | COE16B015 | DODDI BALAJI NIKHIL | 8.77 |
| 14 | COE16B016 | GUGULOTH JANARDHAN | 6.7 |
| 15 | COE16B017 | GUNDA HIMAJA | 8.97 |
| 16 | COE16B018 | HARINI R | 9.68 |
| 17 | COE16B019 | HRISHIKESH. P.M | 9.33 |
| 18 | COE16B020 | JAJJARA PRADEEP | 7.55 |
| 19 | COE16B022 | KOLLI CHINMAI VIGNYA | 7.91 |
| 20 | COE16B023 | KONGATHI MYTHRI | 8.86 |
| 21 | COE16B024 | MACHA SADHANA | 8.37 |
| 22 | COE16B025 | MANTRIPRAGADA ANJANI SANKAR | 9.24 |
| 23 | COE16B026 | MANUKONDA SUDHEER | 7.6 |
| 24 | COE16B027 | NANDIGAMA MANOJ PRAVEEN | 7.58 |
| 25 | COE16B028 | PALAKURTHY SAIKUMAR | 7.44 |
| 26 | COE16B029 | PALLERLA NANDA KISHORE | 6.97 |
| 27 | COE16B030 | POLISETTY SANTHOSHI | 8.45 |
| 28 | COE16B031 | PRANJALI AJAY PARSE | 8.78 |
| 29 | COE16B032 | PULAVARTHI NAGA VENKATA JASWANTH | 6.05 |
| 30 | COE16B033 | R LOKESH KUMAR | 8.09 |
| 31 | COE16B034 | SHIVESH M M | 9.18 |
| 32 | COE16B035 | SREEREDDY SREE CHARAN REDDY | 8.79 |
| 33 | COE16B036 | SRIRAM VAISHNAVI | 8.47 |
| 34 | COE16B037 | VALLABHANENI SAI PHANI TEJA | 9.01 |
| 35 | COE16B039 | YANALA VENI MADHAVI | 9.03 |
| 36 | COE16B040 | GOUTHAMAN  PREMLAL | 7.72 |
| 37 | COE16B041 | GORANTLA MEGHANA | 9.4 |
| 38 | COE16B042 | M VINITHA | 9.29 |
| 39 | COE16B043 | MEGHANA REDDY TELLURI | 9.08 |
| 40 | COE16B044 | S AJAY NARAYANAN | 9.61 |

# B. Tech. in Electronics and Communication Engineering

***with specialization in Design and Manufacturing***

| S.no. | Roll No. | Name | CGPA |
|---|---|---|---|
| 1 | EDM16B001 | ABIRAMI A | 9.13 |
| 2 | EDM16B002 | AKHIL SARIKI | 7.55 |
| 3 | EDM16B003 | BETANABOTLA KAUSHIK | 8.46 |
| 4 | EDM16B004 | BHEEMAVARAM DHARANIPRIYA | 7.36 |
| 5 | EDM16B005 | BOORGULA KESHAVA | 5.95 |
| 6 | EDM16B006 | DEVARAPALLI BHARGAV | 6.14 |
| 7 | EDM16B007 | ERROLLA VIVEK | 6.29 |
| 8 | EDM16B008 | GATRAM MANOJ VENKATA SAI | 8.55 |
| 9 | EDM16B010 | GUNTURU SOWMYA | 8.73 |
| 10 | EDM16B011 | HARSHITHA K S | 8.42 |
| 11 | EDM16B012 | JASWANTH KUMAR AMBATI | 7.49 |
| 12 | EDM16B013 | JAYANTHI PRANITHA | 8.06 |
| 13 | EDM16B014 | JAYANTHI VYSHNAVI | 8.17 |
| 14 | EDM16B015 | JEEVA KESHAV S | 9.15 |
| 15 | EDM16B016 | K BHARATI | 9.27 |
| 16 | EDM16B017 | KUNDRAPU VENKATA RAO | 7.19 |
| 17 | EDM16B018 | LINGALA SAI MAHESH | 7.37 |
| 18 | EDM16B020 | MADHURI DAMARA | 7.51 |
| 19 | EDM16B021 | MANDALEEKA PRABHA SAHITI | 8.94 |
| 20 | EDM16B023 | MUDIREDDY SNIGDHA REDDY | 8.75 |
| 21 | EDM16B024 | N T SUNNY RAJ | 7.2 |
| 22 | EDM16B025 | N V SAI VIGNESH PALLIKONDA | 7.14 |
| 23 | EDM16B026 | NALAVATH SAI KUMAR | 7.21 |
| 24 | EDM16B027 | NEERUGATTI PRATHYUSHA | 7.45 |
| 25 | EDM16B028 | NITIN PRIYADARSHINI SHANKAR | 8.97 |
| 26 | EDM16B029 | PINNINTI SAI PRIDHVI | 7.16 |
| 27 | EDM16B030 | S SIDARTH | 8.92 |
| 28 | EDM16B031 | SAI SANDEEP MOOD NAIK | 7.45 |
| 29 | EDM16B032 | SANGADI TEJARAM | 8.97 |
| 30 | EDM16B033 | SEEMAKURTHI ANAND DINESH | 8.84 |
| 31 | EDM16B034 | SRIYA MEGHANA NANDAM | 8.28 |
| 32 | EDM16B035 | TAKKELLAPATI HARIKA | 8.55 |
| 33 | EDM16B036 | VANCHA SHARATH REDDY | 7.92 |
| 34 | EDM16B037 | VENNA SAHITHI | 8.69 |
| 35 | EDM16B038 | YADAVALLI AVINASH | 7.54 |
| 36 | EDM16B039 | NITHILAVATHI  THIRUSENTHILANDA ARASU | 8.62 |
| 37 | EDM16B040 | K V JEEVAN KUMAR | 6.15 |
| 38 | EDM16B041 | DAWARE PRATHAMESH MAHIPATI | 9.03 |
| 39 | EDM16B042 | K DEEPA | 8.61 |

# B. Tech. in Mechanical Engineering

***with specialization in Design and Manufacturing***

| S.No. | Roll No. | Name | CGPA |
|---|---|---|---|
| 1 | MDM16B002 | AIYUSH GOYAL | 8.53 |
| 2 | MDM16B003 | AMBATI SREECHARAN | 7.95 |
| 3 | MDM16B005 | B VIGNESH | 8.26 |
| 4 | MDM16B006 | BUSA SATISHYADAV | 7.58 |
| 5 | MDM16B007 | CHITRARTHA DIXIT | 8.96 |
| 6 | MDM16B009 | GHULAXE TANMAY SHARADKUMAR | 6.54 |
| 7 | MDM16B010 | GORINKA ABHILASH | 8.02 |
| 8 | MDM16B011 | JADHAV GAUTAM KRISHNA | 6.65 |
| 9 | MDM16B012 | JARUPULA ABHILASH NAIK | 7.1 |
| 10 | MDM16B013 | KALAL VISHNU JANARDHAN GOUD | 7.41 |
| 11 | MDM16B014 | KUCHANA SHARATH CHANDRA | 7.72 |
| 12 | MDM16B015 | LINGAREDDY SUSWANTH REDDY | 7.98 |
| 13 | MDM16B016 | MAMIDI RAJA HARSHA VARDHAN NAIDU | 8.24 |
| 14 | MDM16B017 | NARAYANA BABU P E | 8.63 |
| 15 | MDM16B018 | P SIRI CHANDANA REDDY | 8 |
| 16 | MDM16B019 | PARALKAR AMEYA VIRENDRA | 7.73 |
| 17 | MDM16B020 | PASIKANTI SAI ANURAG | 7.41 |
| 18 | MDM16B021 | PASUMARTI SATYA SAI PRANEETH | 7.77 |
| 19 | MDM16B022 | PAVITRA BHAGAVATULA | 9.02 |
| 20 | MDM16B024 | PUTTI HEMANAGASAI | 7.3 |
| 21 | MDM16B025 | RAHUL NARASIMHAN R | 9.18 |
| 22 | MDM16B026 | RAM KOWSHIK S | 8.51 |
| 23 | MDM16B027 | RAMAVATH GNANESHWAR | 7.48 |
| 24 | MDM16B028 | RAPOLE VAMSHI VARDHAN | 7.78 |
| 25 | MDM16B029 | RISHAV RAMAN | 7.24 |
| 26 | MDM16B030 | RISHIKESH M NANDAKUMAR | 8.22 |
| 27 | MDM16B031 | ROSHAN PATEL | 8.02 |
| 28 | MDM16B032 | S SIDARTH | 7.97 |
| 29 | MDM16B033 | SAI SRI HARSHA SUNDRU | 6.92 |
| 30 | MDM16B034 | SASISEKARAN B | 7.78 |
| 31 | MDM16B035 | SUYOG GARG | 8.65 |
| 32 | MDM16B036 | TATAVARTY ANANTHA LAKSHMI PRASANNA | 8.94 |
| 33 | MDM16B037 | VAIRAGADE HIMANSHU VIRENDRA | 8.93 |
| 34 | MDM16B038 | Y ADITYA VARMA | 9.73 |
| 35 | MDM16B039 | YATHIRAJAM BALA SUBRAHMANYAM | 8.32 |

# B Tech in Mechanical Engineering - Smart Manufacturing

| S.No. | Roll No. | Name | CGPA |
|---|---|---|---|
| 1 | MSM16B001 | AILONE AKANKSHA | 9.03 |
| 2 | MSM16B002 | ARIVETI RANGA HARSHAVARDHAN | 8.36 |
| 3 | MSM16B003 | AVVARU SUNAY DURGESH | 8 |
| 4 | MSM16B005 | BANDILI MAHESH | 6.99 |
| 5 | MSM16B006 | BANKAR ABHISHEK ANIL | 7.59 |
| 6 | MSM16B007 | CHAKKA JASWANTH | 6.97 |
| 7 | MSM16B008 | CHAMANAPUDI ASA VARA PRAVEEN | 6.32 |
| 8 | MSM16B009 | CHATTETI CHANDAN | 7.24 |
| 9 | MSM16B010 | GADAMCHETTY MANOJ | 8.53 |
| 10 | MSM16B011 | GARREPALLI SRIVANDYA | 8.57 |
| 11 | MSM16B012 | JEFIN SOLOMON JP | 8.67 |
| 12 | MSM16B013 | JOSHNA LOKAVARAPU | 8.43 |
| 13 | MSM16B015 | KARAMBOR CHAKRAVARTY SRIYA | 9.22 |
| 14 | MSM16B016 | KUMTAMUKKULA LALIT SUDHIR | 8.39 |
| 15 | MSM16B017 | MADUGONDA SAI VIVEK | 7.72 |
| 16 | MSM16B018 | MUDAVATH VAMSHI NAIK | 6.61 |
| 17 | MSM16B019 | NARLAGIRI VINAY KUMAR | 7.79 |
| 18 | MSM16B020 | NARNI JAGADEESH SIVA DURGA PRASAD | 7.51 |
| 19 | MSM16B021 | NAVGHARE ADITYA SHRIDHAR | 8.75 |
| 20 | MSM16B022 | NISHANT KUMAR | 7.36 |
| 21 | MSM16B024 | POTLURI SASIKANTH | 8.12 |
| 22 | MSM16B025 | R RAM NARAYAN | 8.93 |
| 23 | MSM16B026 | RAJESH KUMAR | 8.98 |
| 24 | MSM16B027 | RAM BAHAL TIWARI | 8.32 |
| 25 | MSM16B028 | RATHOD UMESH | 6.72 |
| 26 | MSM16B029 | S ADITYA | 8.52 |
| 27 | MSM16B031 | SAKET KUMAR MONGRE | 8.1 |
| 28 | MSM16B032 | SAYANTH SUNIL | 6.59 |
| 29 | MSM16B034 | SIDDHANT KARMARKAR | 8.73 |
| 30 | MSM16B035 | THIPPABATTUNI ANTONY ROHIT | 9.04 |
| 31 | MSM16B036 | VIVEK YADAV | 8.57 |

## Dual Degree

## B. Tech. in Computer Engineering and M. Tech in Computer Engineering

| S.No. | Roll No. | Name | Gender | CGPA |
|---|---|---|---|---|
| 1 | CED15I001 | PRANAY ANKIT TIRU | Male | 7.22 |
| 2 | CED15I002 | R MUKESH | Male | 9.04 |
| 3 | CED15I003 | G SRI KRISHNA | Male | 8.73 |
| 4 | CED15I004 | R.LAKSHMI NARASIMHAN | Male | 6.96 |
| 5 | CED15I005 | MUGUNDHAN K | Male | 8.26 |
| 6 | CED15I007 | GOVIND K P | Male | 9.24 |
| 7 | CED15I009 | MANASA KANDIMALLA | Female | 9.19 |
| 8 | CED15I010 | ANUMULA NIKHIL KUMAR | Male | 6 |
| 9 | CED15I011 | FAJAR K | Male | 6.46 |
| 10 | CED15I012 | PALAPARTHI ROHITH | Male | 6.55 |
| 11 | CED15I013 | VEDANT BASSI | Male | 8.74 |
| 12 | CED15I014 | VIDHATHRI | Female | 9.47 |
| 13 | CED15I015 | SONATKAR VIRAJ GANESH | Male | 7.34 |
| 14 | CED15I016 | MANDADI VASANTHI | Female | 7.73 |
| 15 | CED15I017 | YUTIKA CHANDRASHEKHAR KULWE | Female | 7.6 |
| 16 | CED15I018 | PUTTA SACHIN | Male | 7.29 |
| 17 | CED15I019 | MUNUKUTLA GOWTHAM | Male | 7.49 |
| 18 | CED15I020 | VADTHYA CHAITANYA | Female | 7.26 |
| 19 | CED15I021 | ANMOL GUPTA | Male | 9.33 |
| 20 | CED15I022 | REMALA NIKHILA | Female | 7.95 |
| 21 | CED15I023 | RUCHI SAHA | Female | 8.89 |
| 22 | CED15I024 | V DIVYA | Female | 9.17 |
| 23 | CED15I025 | ADITYA PRAKASH | Male | 7.64 |
| 24 | CED15I026 | BRAHMI DWIVEDI | Female | 8.84 |
| 25 | CED15I027 | SHWET PRAKASH | Male | 7.8 |
| 26 | CED15I028 | NAYAN ADHIKRAO MANE | Female | 8.33 |
| 27 | CED15I029 | PRATHAMESH A DEGWEKAR | Male | 9.16 |
| 28 | CED15I030 | DANI PRAKASH ESUKAPALLI | Male | 8.36 |
| 29 | CED15I031 | AKSHAY KUMAR | Male | 8.46 |
| 30 | CED15I032 | Kale Shivani Sunil | Female | 8.01 |
| 31 | CED15I033 | KOKKALLA SRINATH | Male | 7.92 |
| 32 | CED15I035 | KONDAPALLI AKHILA | Female | 7.34 |
| 33 | CED15I036 | JEFFREY SAM JACOB | Male | 6.79 |
| 34 | CED15I037 | MUCHINTALA SESHA SAI TRISHUL | Male | 8.06 |
| 35 | CED15I038 | Mohit Agarwal | Male | 6.6 |
| 36 | CED15I039 | V.K. DINGU SAGAR | Male | 9.22 |
| 37 | CED15I040 | V.AKASH | Male | 9.29 |
| 38 | CED15I041 | NIMILIKHA VEMPARALA | Female | 8.52 |
| 39 | CED15I042 | G.SARAVANA BALAJI | Male | 9.44 |
| 40 | CED15I043 | EASHAN DASH | Male | 9.34 |

## B. Tech. in Electronics and Communication Engineering

***with specialization in Design and Manufacturing and***

## M. Tech in Signal Processing and Communication Systems Design

| S.no. | Roll No. | Name | CGPA |
|---|---|---|---|
| 1 | ESD15I001 | ABHAY PRAHALAD MASLEKAR | 6.49 |
| 2 | ESD15I002 | MABBU GANESH VENKAT SAI AKHIL | 8.16 |
| 3 | ESD15I003 | S.ABINAYA | 8.98 |
| 4 | ESD15I005 | SANDESH V BHARADWAJ | 7.36 |
| 5 | ESD15I006 | K.NIRANJAN | 8.36 |
| 6 | ESD15I007 | GUTTIKONDA GOWTHAM | 8.3 |
| 7 | ESD15I008 | ROYYURU VINEETH CHAND | 7.09 |
| 8 | ESD15I009 | BATHALA SIVA CHAITANYA | 7.48 |
| 9 | ESD15I010 | S PRANAV KUMAR | 9.28 |
| 10 | ESD15I011 | BALAJI V | 6.81 |
| 11 | ESD15I012 | K RAJESH | 5.87 |
| 12 | ESD15I013 | BANOTH KARUN | 6.05 |
| 13 | ESD15I014 | HIMAVANTH REDDY PUNDLA | 8.53 |
| 14 | ESD15I015 | M ABHAY VARDHAN | 8.83 |
| 15 | ESD15I016 | MADHAN.J | 7.68 |
| 16 | ESD15I018 | DHARMESH HARSHA | 8.04 |
| 17 | ESD15I019 | GANJI VENKATA GANGA TEJA PRATHAP | 7.47 |
| 18 | ESD15I020 | S SANJANA | 9.21 |

## B. Tech. in Electronics and Communication Engineering

***with specialization in Design and Manufacturing and***

## M. Tech in VLSI and Electronic Systems Design

| S.No. | Roll No. | Name | CGPA |
|---|---|---|---|
| 1 | EVD15I001 | VARSHITHA BHAVNI SRIGANESH | 6.69 |
| 2 | EVD15I002 | M.DINESH | 7.71 |
| 3 | EVD15I003 | LINGAM SRAVANI | 8.68 |
| 4 | EVD15I004 | N V APARAJITHAN | 8.47 |
| 5 | EVD15I005 | KOLLI SNEHA LATHA | 7.84 |
| 6 | EVD15I006 | A.S.PRAVIN THILAKAR | 8.42 |
| 7 | EVD15I007 | F KIRAN ROBERT | 9.44 |
| 8 | EVD15I008 | VASTRAD SAKSHI BASAWARAJ | 8.84 |
| 9 | EVD15I009 | KOLLA SANDEEP | 8.16 |
| 10 | EVD15I010 | DASARI BHAVYA DEEPIKA | 7.91 |
| 11 | EVD15I011 | NITTURU GAYATHRI | 7.63 |
| 12 | EVD15I012 | BOLAPATI SRAVYA | 7.63 |
| 13 | EVD15I013 | RATHLAVATH PRIYANKA | 7.77 |
| 14 | EVD15I014 | CHANDRA SAI SRINIVAS | 8.62 |

| | | | |
|---|---|---|---|
| 15 | EVD15I015 | GOLLAPUDI VENKATA SAI KUMAR | 8.81 |
| 16 | EVD15I016 | VYSHAK NATH C A | 9.02 |
| 17 | EVD15I018 | KRITI PATHAK | 7.98 |
| 18 | EVD15I019 | S HARISH MANIKANDAN | 8.16 |
| 19 | EVD15I020 | AMRUTHA MANOHARAN | 8.95 |

## B. Tech. in Mechanical Engineering

***with specialization in Design and Manufacturing and***

## M. Tech in Advanced Manufacturing

| S.No. | Roll No. | Name | CGPA |
|---|---|---|---|
| 1 | MFD15I001 | NIYAZI ADEEB KHASIM KHAN | 6.63 |
| 2 | MFD15I002 | MANCHALA VAISHNAVI | 8.36 |
| 3 | MFD15I003 | GALLA PRASANTH KUMAR | 6.94 |
| 4 | MFD15I004 | POTNURU HEMA PRANEETHA NAIDU | 9 |
| 5 | MFD15I006 | RAGI LAKSHMAN KUMAR | 8.08 |
| 6 | MFD15I007 | REDDI SRIHARI NAIDU | 8.36 |
| 7 | MFD15I008 | SAI UDAY KIRAN Y | 7.98 |
| 8 | MFD15I009 | KOTHA RAJ KUMAR REDDY | 8.75 |
| 9 | MFD15I010 | PARTH LAL | 8.58 |
| 10 | MFD15I011 | P ROKESH | 8.59 |
| 11 | MFD15I012 | PRAKASH CHANTIBABU DIDLA | 7.42 |
| 12 | MFD15I013 | ROHAN KUMAR PANDA | 7.97 |
| 13 | MFD15I014 | VIVEK KHATUA | 8.98 |
| 14 | MFD15I015 | AJAY KUMAR BYRI | 8.05 |
| 15 | MFD15I016 | DEVALLA SAI TEJA | 8.33 |
| 16 | MFD15I017 | BANOTH SRINU | 7.5 |
| 17 | MFD15I018 | A.NIVAAS | 8.02 |
| 18 | MFD15I019 | PILLI INDU PRIYA | 8.13 |

## B. Tech. in Mechanical Engineering

***with specialization in Design and Manufacturing and***

## M. Tech in Product Design

| S.No. | Roll No. | Name | CGPA |
|---|---|---|---|
| 1 | MPD15I001 | HADI MOOTHAPILAKATH KOYA | 6.53 |
| 2 | MPD15I002 | KAMBALLI HARSHA VARDHINI | 8.29 |
| 3 | MPD15I003 | D DEEKSHITH REDDY | 8.43 |
| 4 | MPD15I004 | SAI PRASATH K J | 8.25 |
| 5 | MPD15I005 | RAVI TEJA M V L | 7.75 |
| 6 | MPD15I007 | KARTIK BITRA | 7.5 |
| 7 | MPD15I008 | ELSURI HARISH BABU | 6.33 |

| | | | |
|---|---|---|---|
| 8 | MPD15I009 | MOHIT PATHAK | 6.33 |
| 9 | MPD15I010 | SARANYA S | 8.69 |
| 10 | MPD15I011 | GAJARAJ G | 8.74 |
| 11 | MPD15I012 | VIJAYKUMAR T C | 8.33 |
| 12 | MPD15I013 | VIKAS GAURAV | 7.57 |
| 13 | MPD15I014 | ARAVIND.C.B | 8.53 |
| 14 | MPD15I015 | SEEDARI SRINIVAS | 6.54 |
| 15 | MPD15I016 | T.SURYAPRAKASH | 8.83 |
| 16 | MPD15I018 | SUMUKI R | 8.72 |
| 17 | MPD15I019 | RATNANJALI TIWARI | 9.31 |

**M Tech in Electronics and Communication Engineering**

*with Specialization in Communication Systems Design*

| S.No. | Roll No. | Name | CGPA |
|---|---|---|---|
| 1 | CDS18M001 | MEDARA SREENIVASULU | 9.04 |
| 2 | CDS18M002 | V L NIKITHA | 7.72 |
| 3 | CDS18M003 | GOWRI MURALEEDHARAN B | 10 |
| 4 | CDS18M004 | CHANDAVARAM VYSHNAVI | 7.76 |
| 5 | CDS18M006 | SANJANA PAUL | 9.29 |
| 6 | CDS18M007 | PALANCHU JYOTHIRMAI | 8.3 |
| 7 | CDS18M008 | B VENKATA RAGHU RAM | 9.08 |
| 8 | CDS18M009 | RAKSANTA S | 9.13 |
| 9 | CDS18M010 | CHAITANYA D GOWDA | 8.58 |

**M Tech in Electronics and Communication Engineering**

*with Specialization in Electronic Systems Design*

| S.No. | Roll No. | Name | CGPA |
|---|---|---|---|
| 1 | EDS18M001 | VIKASH SINGH | 7.89 |
| 2 | EDS18M002 | THUMPIRI REDDY MANASA | 9.05 |
| 3 | EDS18M003 | P RAMYA PRIYA | 8.78 |
| 4 | EDS18M004 | SOWMIYA S | 8.7 |
| 5 | EDS18M005 | NEERAJ DUBEY | 6.91 |
| 6 | EDS18M009 | SWAATHI S | 8.83 |
| 7 | EDS18M010 | A.SRIVANI | 9.05 |
| 8 | EDS18M011 | PINTU KUMAR | 7.34 |
| 9 | EDS18M013 | ARTHI R | 9.89 |

**M Tech in Mechanical Engineering**

*with Specialization in Mechanical Systems Design*

| S.no. | Roll No. | Name | CGPA |
|---|---|---|---|
| 1 | MDS18M001 | VALECHA DHEERAJ KAILAS | 9.09 |
| 2 | MDS18M002 | BHAVSAR DIVYAKUMAR ASHIT | 9.75 |
| 3 | MDS18M003 | CHAVAN AJITKUMAR ANKUSH | 9.21 |
| 4 | MDS18M004 | NAVEEN M | 6.76 |
| 5 | MDS18M005 | KETAN VINAYAK WARGHAT | 8.66 |
| 6 | MDS18M006 | AVINASH MOHAN M | 9.47 |
| 7 | MDS18M007 | GEMBALI VIDYASAGAR | 8.82 |
| 8 | MDS18M008 | NAGENDRA KUMAR CHAURASIA | 8.55 |
| 9 | MDS18M009 | NISANTH KUMAR P | 8.87 |
| 10 | MDS18M013 | AKASH KUMAR | 7.91 |
| 11 | MDS18M014 | VECHALAPU NAGA VENKATA SAI KIRAN | 8.49 |

**M Tech in Mechanical Engineering**

*with Specialization in Smart Manufacturing*

| S.No. | Roll No. | Name | CGPA |
|---|---|---|---|
| 1 | SMT18M001 | ROHIT KUMAR JHA | 8.8 |
| 2 | SMT18M002 | PRADEEP KUMAR VERMA | 8.18 |
| 3 | SMT18M003 | SHASHWAT PANDEY | 9.33 |
| 4 | SMT18M005 | PRAVEEN KUMAR | 8.79 |
| 5 | SMT18M006 | S RAJA RAMANAN | 7.99 |
| 6 | SMT18M007 | VISHAK P M | 9.89 |
| 7 | SMT18M008 | ASHISH OMAR | 7.88 |
| 8 | SMT18M009 | BAFNA SHUBHAM AJIT | 8.55 |
| 9 | SMT18M010 | MEVALAL NISHAD | 8.01 |
| 10 | SMT18M011 | RAMASHANKAR YADAV | 8.57 |
| 11 | SMT18M012 | ABHINAV GOVIND PATEL | 7.61 |
| 12 | SMT18M013 | MD TANWEER AHMAD | 8.42 |

## PH.D. SCHOLARS

| S.No. | Roll No. | Name | Batch |
|---|---|---|---|
| 1 | MDM11D003 | C. GURUNATHAN | MDM |
| 2 | MDM13D003 | VINAYAGA MURUGA PANDY. N | MDM |
| 3 | EDM14D004 | XAVIER AROCKIARAJ S | EDM |
| 4 | MDM11D001 | K BALAJI | MDM |
| 5 | PHY13D001 | ASHISH KUMAR | PHY |

# Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram

## Revised Academic Calendar - Odd Semester - July - November 2020

| DAY | JULY 20 | | | AUGUST 20 | | | SEPTEMBER 20 | | | OCTOBER 20 | | | NOVEMBER 20 | | | | DECEMBER 20 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Date | | Days | Date | | Days | Date | | Days | Date | | Days | Date | | Days | | Date | |
| TUE | | | | | | | 1 | | | | | | | | | | 1 | End Semester / Jan-May 2021 Fee Payment Portal open |
| WED | 1 | | | | | | 2 | | | | | | | | | | 2 | End Semester / PG Project Review / DD Comprehensive Exam / Viva |
| THU | 2 | | | | | | 3 | | | 1 | | | 1 | | | | 3 | End Semester PG Project Review / DD Comprehensive Exam / Viva |
| FRI | 3 | | | | | | 4 | | | 2 | Gandhi Jayanthi | | | | | | 4 | End Semester PG Project Review / DD Comprehensive Exam / Viva |
| SAT | 4 | | | 1 | Id-ul-Zuha-Bakrid | | 5 | | | 3 | Special Classes | | 2 | | | | 5 | |
| SUN | 5 | | | 2 | | | 6 | | | 4 | | | | 1 | | | 6 | |
| MON | 6 | | | 3 | | | 7 | | | 5 | | | 3 | 2 | Pre-Registration for Jan-May 2021 Starts | 1 | 7 | |
| TUE | 7 | | | 4 | | | 8 | Commencement of Classes / Enrolment | | 6 | | | 4 | 3 | | 2 | 8 | |
| WED | 8 | | | 5 | | | 9 | | 1 | 7 | | | 5 | 4 | | 3 | 9 | |
| THU | 9 | | | 6 | | | 10 | | 2 | 8 | | | 6 | 5 | | 4 | 10 | |
| FRI | 10 | | | 7 | | | 11 | | 3 | 9 | | | 7 | 6 | | 5 | 11 | |
| SAT | 11 | | | 8 | | | 12 | Special Classes | 4 | 10 | Special Classes | | 8 | 7 | Special Classes | 6 | 12 | |
| SUN | 12 | | | 9 | | | 13 | | | 11 | | | | 8 | | | 13 | |
| MON | 13 | | | 10 | | | 14 | Last date for enrolment with fine | 5 | 12 | Class Committee | | 9 | 9 | | 7 | 14 | Last date for submission of grades |
| TUE | 14 | | | 11 | | | 15 | | 6 | 13 | Class Committee | | 10 | 10 | | 8 | 15 | |
| WED | 15 | | | 12 | | | 16 | | 7 | 14 | | | 11 | 11 | | 9 | 16 | |
| THU | 16 | | | 13 | | | 17 | | 8 | 15 | | | 12 | 12 | | 10 | 17 | |
| FRI | 17 | | | 14 | | | 18 | | 9 | 16 | | | 13 | 13 | | 11 | 18 | Declaration of Results |
| SAT | 18 | | | 15 | Independence Day | | 19 | Special Classes | 10 | 17 | Special Classes | | 14 | 14 | Diwali/ Deepavali | | 19 | |
| SUN | 19 | | | 16 | | | 20 | | | 18 | | | | 15 | | | 20 | |
| MON | 20 | | | 17 | | | 21 | Last date to apply for change of electives | 11 | 19 | | | 15 | 16 | | 12 | 21 | Jan-May 2021 Registration Starts |
| TUE | 21 | | | 18 | | | 22 | Class Committee | 12 | 20 | | | 16 | 17 | | 13 | 22 | |
| WED | 22 | | | 19 | | | 23 | Class Committee | 13 | 21 | | | 17 | 18 | | 14 | 23 | |
| THU | 23 | | | 20 | | | 24 | | 14 | 22 | | | 18 | 19 | | 15 | 24 | |
| FRI | 24 | | | 21 | | | 25 | | 15 | 23 | | | 19 | 20 | | 16 | 25 | Christmas Day |
| SAT | 25 | | | 22 | | | 26 | Special Classes | 16 | 24 | Special Classes | | 20 | 21 | Special Classes Compilation of Attendance | 17 | 26 | |
| SUN | 26 | | | 23 | | | 27 | | | 25 | Dussehra/ Vijay Dashmi | | | 22 | | | 27 | |
| MON | 27 | | | 24 | | | 28 | | 17 | 26 | | | 21 | 23 | End Semester | | 28 | |
| TUE | 28 | | | 25 | | | 29 | | 18 | 27 | | | 22 | 24 | End Semester | | 29 | |
| WED | 29 | | | 26 | | | 30 | | 19 | 28 | | | 23 | 25 | End Semester | | 30 | Jan-May 2021 Registration Ends |
| THU | 30 | | | 27 | | | | | | 29 | | | 24 | 26 | End Semester | | 31 | Jan-May 2021 Fee Payment Portal close |
| FRI | 31 | | | 28 | | | | | | 30 | Id-E-Milad | | | 27 | End Semester | | | |
| SAT | | | | 29 | | | | | | 31 | Special Classes | | 25 | 28 | | | | |
| SUN | | | | 30 | Muharram | | | | | | | | | 29 | | | | |
| MON | | | | 31 | | | | | | | | | | 30 | Guru Nanak's Birthday | | | |

| Month | Mondays | Tuesdays | Wednesdays | Thursdays | Fridays | Saturday | Total |
|---|---|---|---|---|---|---|---|
| September | 3 | 3 | 4 | 3 | 3 | 3 | 19 |
| October | 4 | 4 | 4 | 5 | 3 | 5 | 25 |
| November | 3 | 3 | 3 | 3 | 3 | 2 | 17 |
| Total | 10 | 10 | 11 | 11 | 9 | 10 | 61 |

Annexure - 5

# INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, DESIGN AND MANUFACTURING KANCHEEPURAM

## ACADEMIC CALENDAR FOR B TECH 2020 BATCH

## Semester 1

| | November 2020 | | | December 2020 | | | January 2021 | | | February 2021 | | | March 2021 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Date | | Days | Date | | Days | Date | | Days | Date | | Days | Date | | Days |
| Sat | | | | | | | | | | | | | | | |
| Sun | 1 | | | | | | | | | | | | | | |
| Mon | 2 | | | | | | | | | 1 | Opening of Pre-Registration for Semester 2 | 1 | 1 | End Semester | |
| Tue | 3 | | | 1 | | 1 | | | | 2 | | 2 | 2 | End Semester | |
| Wed | 4 | | | 2 | | 2 | | | | 3 | | 3 | 3 | End Semester | |
| Thu | 5 | | | 3 | | 3 | | | | 4 | | 4 | 4 | End Semester | |
| Fri | 6 | | | 4 | | 4 | 1 | | 1 | 5 | | 5 | 5 | | |
| Sat | 7 | | | 5 | Wednesday's Timetable | 5 | 2 | Tuesday's Timetable | 2 | 6 | Wednesday's Timetable | 6 | 6 | | |
| Sun | 8 | | | 6 | | | 3 | | | 7 | | | 7 | | |
| Mon | 9 | | | 7 | Class Committee | 6 | 4 | | 3 | 8 | Last date to apply for Makeup Quiz II | 7 | 8 | | |
| Tue | 10 | | | 8 | Class Committee | 7 | 5 | | 4 | 9 | Last date to announce Quiz II Marks | 8 | 9 | | |
| Wed | 11 | | | 9 | Class Committee | 8 | 6 | | 5 | 10 | | 9 | 10 | | |
| Thu | 12 | | | 10 | | 9 | 7 | | 6 | 11 | | 10 | 11 | | |
| Fri | 13 | | | 11 | | 10 | 8 | Last date to apply for Makeup Quiz I | 7 | 12 | | 11 | 12 | | |
| Sat | 14 | | | 12 | Tuesday's Timetable | 11 | 9 | Wednesday's Timetable | 8 | 13 | Thursday's Timetable | 12 | 13 | Last date for submission of Grades | |
| Sun | 15 | | | 13 | | | 10 | | | 14 | | | 14 | | |
| Mon | 16 | | | 14 | | 12 | 11 | Last date to announce Quiz I Marks | 9 | 15 | Closing of Pre-Registration for Semester 2 | 13 | 15 | Closing of Semester 2 Fee payment window | |
| Tue | 17 | | | 15 | | 13 | 12 | | 10 | 16 | Opening of Semester 2 Fee payment window | 14 | 16 | Declaration of Semester 1 Results | |
| Wed | 18 | | | 16 | | 14 | 13 | Class Committee | 11 | 17 | | 15 | 17 | Registration Portal to open for Semester 2 | |
| Thu | 19 | | | 17 | | 15 | 14 | Pongal | | 18 | | 16 | 18 | | |
| Fri | 20 | | | 18 | | 16 | 15 | Class Committee | 12 | 19 | | 17 | 19 | | |
| Sat | 21 | | | 19 | Friday's Timetable | 17 | 16 | Class Committee Thursday's Timetable | 13 | 20 | Friday's Timetable | 18 | 20 | | |
| Sun | 22 | | | 20 | | | 17 | | | 21 | | | 21 | | |
| Mon | 23 | Commencement of Classes / Enrolment | 1 | 21 | | 18 | 18 | | 14 | 22 | Compilation of Attendance | 19 | 22 | | |
| Tue | 24 | | 2 | 22 | | 19 | 19 | | 15 | 23 | | | 23 | | |
| Wed | 25 | | 3 | 23 | | 20 | 20 | | 16 | 24 | End Semester | | 24 | Registration Portal to close for Semester 2 | |
| Thu | 26 | | 4 | 24 | | 21 | 21 | | 17 | 25 | End Semester | | 25 | | |
| Fri | 27 | | 5 | 25 | Christmas Day | | 22 | | 18 | 26 | End Semester | | 26 | | |
| Sat | 28 | Tuesday's Timetable | 6 | 26 | Monday's Timetable | 22 | 23 | Friday's Timetable | 19 | 27 | | | 27 | | |
| Sun | 29 | | | 27 | | | 24 | | | 28 | | | 28 | | |
| Mon | 30 | | 7 | 28 | Quiz I | | 25 | | 20 | | | | 29 | Commencement of Classes/ Enrolment For Semester 2 | |
| Tue | | | | 29 | Quiz I | | 26 | Republic Day | | | | | 30 | | |
| Wed | | | | 30 | Quiz I | | 27 | Quiz II | | | | | 31 | | |
| Thu | | | | 31 | | 23 | 28 | Quiz II | | | | | | | |
| Fri | | | | | | | 29 | Quiz II | | | | | | | |
| Sat | | | | | | | 30 | Thursday's Timetable | 21 | | | | | | |
| Sun | | | | | | | 31 | | | | | | | | |

| Month | Mon | Tue | Wed | Thu | Fri | Total |
|---|---|---|---|---|---|---|
| November | 2 | 2 | 1 | 1 | 1 | **7** |
| December | 4 | 5 | 5 | 5 | 4 | **23** |
| January | 4 | 4 | 4 | 4 | 5 | **21** |
| February | 4 | 3 | 4 | 4 | 4 | **19** |
| March | - | - | - | - | - | **-** |
| **Total** | **14** | **14** | **14** | **14** | **14** | **70** |

# INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, DESIGN AND MANUFACTURING KANCHEEPURAM

## ACADEMIC CALENDAR FOR B TECH 2020 BATCH

## Semester 2

| | March 2021 | | | April 2021 | | | May 2021 | | | June 2021 | | | July 2021 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Date | | Days | Date | | Days | Date | | Days | Date | | Days | Date | | Days |
| Sat | | | | | | | 1 | Friday's Timetable | 1 | | | | | | |
| Sun | | | | | | | 2 | | | | | | | | |
| Mon | 1 | | | | | | 3 | | 2 | | | | | | |
| Tue | 2 | | | | | | 4 | | 3 | 1 | Quiz II | | | | |
| Wed | 3 | | | | | | 5 | | 4 | 2 | Quiz II | | | | |
| Thu | 4 | | | 1 | | 1 | 6 | | 5 | 3 | | 1 | 1 | End Semester | |
| Fri | 5 | | | 2 | Good Friday | | 7 | | 6 | 4 | Opening of Pre-Registration for Semester 3 | 2 | 2 | End Semester | |
| Sat | 6 | | | 3 | Friday's Timetable | 2 | 8 | Wednesday's Timetable | 7 | 5 | Tuesday's Timetable | 3 | 3 | | |
| Sun | 7 | | | 4 | | | 9 | | | 6 | | | 4 | | |
| Mon | 8 | | | 5 | | 3 | 10 | Last date to apply for Makeup Quiz I | 8 | 7 | | 4 | 5 | End Semester | |
| Tue | 9 | | | 6 | | 4 | 11 | Last date to announce Quiz I Marks | 9 | 8 | | 5 | 6 | End Semester | |
| Wed | 10 | | | 7 | | 5 | 12 | | 10 | 9 | | 6 | 7 | End Semester | |
| Thu | 11 | | | 8 | | 6 | 13 | | 11 | 10 | | 7 | 8 | End Semester | |
| Fri | 12 | | | 9 | Last date for enrolment with fine | 7 | 14 | Id-Ul-Fitr | | 11 | Last date to apply for Makeup Quiz II | 8 | 9 | | |
| Sat | 13 | | | 10 | Wednesday's Timetable | 8 | 15 | Friday's Timetable | 12 | 12 | Wednesday's Timetable | 9 | 10 | | |
| Sun | 14 | | | 11 | | | 16 | | | 13 | | | 11 | | |
| Mon | 15 | | | 12 | | 9 | 17 | | 13 | 14 | Last date to announce Quiz II Marks | 10 | 12 | | |
| Tue | 16 | | | 13 | Class Committee | 10 | 18 | Class Committee | 14 | 15 | Closing of Pre-Registration for Semester 3 | 11 | 13 | | |
| Wed | 17 | | | 14 | Class Committee | 11 | 19 | Class Committee | 15 | 16 | Opening of Semester 3 Fee payment window | 12 | 14 | | |
| Thu | 18 | | | 15 | Class Committee | 12 | 20 | Class Committee | 16 | 17 | | 13 | 15 | Closing of Semester 3 Fee payment window | |
| Fri | 19 | | | 16 | | 13 | 21 | | 17 | 18 | | 14 | 16 | Last Date for submission of Grades | |
| Sat | 20 | | | 17 | Thursday's Timetable | 14 | 22 | Thursday's Timetable | **18** | **19** | Friday's Timetable | 15 | 17 | | |
| Sun | 21 | | | 18 | | | 23 | | | 20 | | | 18 | | |
| Mon | 22 | | | 19 | | 15 | 24 | | 19 | 21 | | 16 | 19 | Declaration of Semester 2 Results | |
| Tue | 23 | | | 20 | | 16 | 25 | | 20 | 22 | | 17 | 20 | Opening of Registration for Semester 3 | |
| Wed | 24 | | | 21 | | 17 | 26 | Buddha Purnima Vesak | | 23 | | 18 | 21 | Id-Ul-Zuha (Bakrid) | |
| Thu | 25 | | | 22 | | 18 | 27 | | 21 | 24 | | 19 | 22 | | |
| Fri | 26 | | | 23 | | 19 | 28 | | 22 | 25 | | 20 | 23 | | |
| Sat | 27 | | | 24 | Wednesday's Timetable | 20 | 29 | Monday's Timetable | 23 | 26 | Tuesday's Timetable | 21 | 24 | Closing of Registration for Semester 3 | |
| Sun | 28 | | | 25 | Mahavir Jayanti | | 30 | | | 27 | | | 25 | | |
| Mon | 29 | Commencement of Classes / Enrolment | 1 | 26 | | 21 | 31 | Quiz II | | 28 | Compilation of Attendance | 22 | 26 | Commencement of Classes/ Enrolment For Semester 3 | |
| Tue | 30 | | 2 | 27 | | 22 | | | | 29 | | | 27 | | |
| Wed | 31 | | 3 | 28 | Quiz I | | | | | 30 | End Semester | | 28 | | |
| Thu | | | | 29 | Quiz I | | | | | | | | 29 | | |
| Fri | | | | 30 | Quiz I | | | | | | | | 30 | | |
| Sat | | | | | | | | | | | | | 31 | | |
| Sun | | | | | | | | | | | | | | | |

| Month | Mon | Tue | Wed | Thu | Fri | Total |
|---|---|---|---|---|---|---|
| March | 1 | 1 | 1 | - | - | **3** |
| April | 4 | 4 | 5 | 5 | 4 | **22** |
| May | 5 | 4 | 4 | 5 | 5 | **23** |
| June | 4 | 5 | 4 | 4 | 5 | **22** |
| July | - | - | - | - | - | **-** |
| **Total** | **14** | **14** | **14** | **14** | **14** | **70** |