



**BEST PRACTICE**

**FOSTERING FUTURISTIC DESIGN & INNOVATION**

## **Objective of the Practice:**

“Futuristic Design & Innovation” aims at reflecting the finest standard for quality in higher education along with benefiting the students through employability, providing business perspectives, and meeting global market/industry challenges while offering environment for freedom of thought, imagination, academic autonomy, multiculturalism, risk-taking, empathy and sustainability by adopting international curriculum.

## **Context**

RIMT University, through its endless endeavors, strives to provide RIMT’s stakeholders with Design & Innovation as a medium to grow holistically along with societal welfare. Education for futuristic design & innovation is an approach to proceed ahead of designing for current age problems through the persona, empathy and experimentation, accomplished using different tools, practices, and procedures through future casting and strategic foresight. Furthermore, it would serve communities, human centric design development and critical design thinking; cross-sector projects for co-learning and collaborations; offering community-based programs to assist designers, craftsmen, industry professionals and artisans to produce valuable outcomes as per the requirements of the stakeholders.

## **Practice**

Located in the Product based Industrial hub of steel sector, RIMT University is continuously demonstrating its potential in an exceptional way from ideation to design: making connections with industry, gathering requirements, developing prototypes, & successful launch of final product to the end-user or in the local market with business modeling. To implement this:

- A team comprising three faculty members (from different disciplines) was formed to attend 40 Days international Capacity Building Programmes on “Product Design & Innovation, Service Design & Innovation and Human-Computer Interaction Design & Innovation” offered by European Union’s ERASMUS+ DESINNO Project, organized by three European countries- Brunel University, UK (contact mode), Politecnico di Milano, Italy (virtual mode) and University of AGEAN Greece (virtual mode).

- Based on the training attended, study scheme updates and syllabus for the Design & Innovation courses were designed and BOS was conducted for the approval of the same.
- With the commencement of the semester, the trained faculty then taught the students from different disciplines since Design & Innovation is an amalgamation of Engineering, Managerial Skills and Science & Technology. The methods of content delivery to the students were according to the global standards: blended learning and collaborative learning approaches were followed.
- Students equipped themselves with various skills such as design thinking, HCI, service design, strategic planning, business modeling, C/C++, AI and IoT based design & innovation during the semester through credit based as well as non-credit courses: Value-added courses, Minor Project and Major Project.
- In parallel to the students' training, connections with industry were set up and preliminary surveys were conducted by the faculty members in the industry for potential pilot projects where budding designers could start working.
- In the university, students were evaluated by the RIMT- Department of Research, Innovation and Incubation for skill set development, identified and were formed into teams along with the faculty member as mentors in the , following collaborative learning approach and were assigned projects identified within the RIMT University or as assigned by the different industry partners.
- In order to empathize the end user requirements, regular interaction of students with the industry experts are organized through industrial visits and expert visits to the University campus. Requirements gathering and surveys are being performed by the students through questionnaires and interviews to gather details of pilot projects. Also students are being showcased in the actual environment where projects after the development phase are to be deployed.
- After finalizing the requirements, project teams plan and ideate the solution and develop the design, prototypes and final products in the RIMT-DESINNO CoE along with the documentation. The projects then developed are being evaluated by the industry-academia panel.

This practice focuses primarily on addressing human requirements in a unique way of meeting their aspirations and developing prototypes. This development geared up specifically for design

& innovation with multidisciplinary approach includes research, ideate, design, prototype, confirm and test; innovate & entrepreneurship; reliability and sustainability in research & innovation.

### Evidence of Success

Training on Design & Innovation from European Union Partner Universities (Pre Covid-19-offline and during Covid-19 -Online):



**Figure: Capacity Building Sessions in Physical mode @ Brunel University London-UK**

- ❖ Three Capacity Building Sessions (3 Faculty from RIMT attended Offline at Brunel University London-UK, 6 Faculty from RIMT attended Online from University of Aegean - Greece and 3 Faculty from RIMT attended Online from Politecnico di Milano-Italy), total 7 faculty members from RIMT University trained as per the requirement (Name: Ravinder Pal Singh, Ajay Singh Rana, Satish Saini, Jasmeen Gill, Farminder Singh, Manish Sharma and Sarbjeet Singh) regarding Product Design and Innovation, Service Design and Innovation and Human-Computer Interaction Design and Innovation.



**Figure: Capacity Building Sessions in Virtual mode @ Politecnico di Milano- Italy**



**Figure: Capacity Building Sessions in Virtual mode @ University of Aegean - Greece**

**Relevant links**

- <https://www.desinno.org/>

- ❖ Setup of Design & Innovation Center of Excellence, hands-on session with students and launch of value added courses on Futuristic Design & Innovation



**Figure: DESINNO Centre of Excellence @ RIMT University**



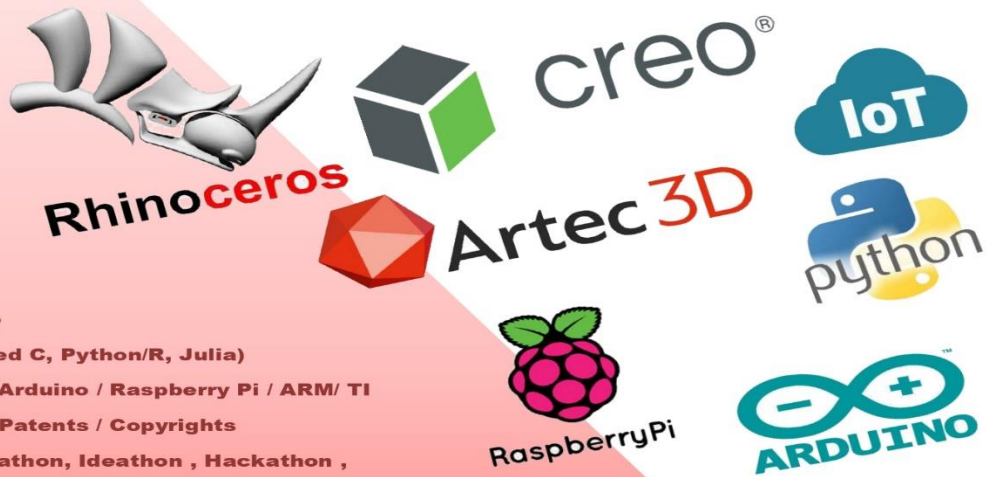
**Figure: Teaching-Learning @ RIMT-DESINNO Centre of Excellence**

# TRAINING SKILL COURSES @ YOUR OWN UNIVERSITY



Day by day industry is getting more competitive; professionals along with the qualification are required to be skilled with updated technologies. Those equipped with skills apart from basic qualification are more readily absorbed by the industry and also they can ignite their entrepreneurship. With this visionary approach, RIMT-Department of Research, Innovation & Incubation (RIMT-DRI) in association with DESINNO International Centre of Excellence through its "SKILL DEVELOPMENT Trainings / Courses" is committing to emphasize on developments in various domains along with career aspects for the same. RIMT-DRI will deliver following technologies / courses:

- > PTC CREO
- > RHINO 3D
- > CNC Milling
- > Laser Engraving
- > 3D Printing
- > 3D Scanning
- > Artec Studio
- > Internet of Things
- > Artificial Intelligence
- > Coding – (C, Embedded C, Python/R, Julia)
- > Embedded Systems: Arduino / Raspberry Pi / ARM/ TI
- > Assistance for: IPR / Patents / Copyrights
- > Preparation for : Codathon, Ideathon , Hackathon ,  
Business Plan, Elevation Pitches, Entrepreneurship



Tools sponsored under European cofunded Project DESINNO



Co-funded by the Erasmus+ Programme of the European Union



3D Scanner



3D Printer



CNC MILLING



LASER ENGRAVER

Turn your Skills into Dream Job

Get in touch with

DEPARTMENT of RESEARCH, INNOVATION & INCUBATION  
 +91-76 96 800 183, +91-78 88 832 380  
[dri@rimt.ac.in](mailto:dri@rimt.ac.in)  
 Ground Floor (B-Block), School of Engineering & Technology  
 RIMT University

Figure: Value Added Courses @ RIMT-DESINNO Centre of Excellence



❖ **Connection with industry and pilot projects**



**Figure: Interaction with Industry Experts**

**Table: Details of Pilot Projects assigned by Industry**

Pilot Project - 1	Pilot Project - 2
Housing Less Mill Stand	AI Sundial
Industry: SMT Machine India Limited	Industry: Brahmand Edutain Pvt Ltd
- Aman Mittal (CEO - SMT) - Ritesh Prashar (Sr. Designer) - Sarbjeet Singh (Designer)	Aman Mittal (CEO - Brahmand) - R. Kumar (Sr. Designer)
- Mechanical Students (Final Year, Pre Final Year)	- Computer Science, Electronics & Electrical, Mechanical Students
- RIMT DESINNO Team - RIMT-DRI Team - Mechanical Department	- RIMT DESINNO Team - RIMT - DRI Team - CSE, EE Department
- Project duration : 180 Days	Project duration : 180 Days

**Links for Pilot Projects:**

1. <https://rimt.ac.in/pilot-projects/project1/>
2. <https://rimt.ac.in/pilot-projects/project2/>

# Adoption of Design & Innovation through study curriculum



Program: B. Tech. (Mechanical Engineering)  
 Department : Department of Mechanical Engineering  
 Year : 3<sup>rd</sup> Year / 6<sup>th</sup> Semester

Total Credits: 24  
 Contact Hours: 30

S.No	Subject Code	Teaching Scheme Course Title	Subject Area	Credits	Contact Hours/Week			Exam Duration (Hrs)		Relative Weights (%)					Total
					L	T	P	Theory	Practical	CWA	LWA	MTE	ETE	EPE	
1	BTME-3600	Open Elective-I		4	3	1	-	3	-	16	-	24	60	-	100
2	BTME-3601	Design of Machine Elements - II		5	4	2	-	3	-	16	-	24	60	-	100
3	BTME-3602	Heat Transfer		4	4	1	-	3	-	16	-	24	60	-	100
4	BTME-3603	Fluid Machinery		4	3	1	-	3	-	16	-	24	60	-	100
5		Departmental Elective-II		3	3	-	-	3	-	16	-	24	60	-	100
6	BTME-3604	Heat Transfer Lab.		1	-	-	2	-	-	-	60	-	-	40	100
7	BTME-3605	Fluid Machinery Lab.		1	-	-	2	-	-	-	60	-	-	40	100
8	BTPD-3621	Personality Development - II		1	-	-	2	-	-	-	100	-	-	-	100
9	BTME-3606	Minor Project		1	-	-	2	-	-	-	60	-	-	40	100
<b>Total</b>				<b>24</b>	<b>17</b>	<b>5</b>	<b>8</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>900</b>

\*\* Minor Project (BTME-3606) has been improved as per the suggestions received from DESINNO Project Partner universities ( European education standard required in HEIs, Design & Innovation capacity building in India through DESINNO Project - Nr.598404-EPP-1-2018-IN-EPPKA2-CBHE-JP11-2018-1-1)

Deptt. of Mechanical Engg.  
 RIMT-Institute of Engg & Tech  
 Mandi Gobindgarh

Director Academics  
 RIMT UNIVERSITY  
 Mandi Gobindgarh



SUBJECT TITLE: Minor Project  
 SUBJECT CODE: BTME-3606

Lecture (L)	Tutorial (T)	Practical (P)	Credit (C)
0	0	2	1

SEMESTER: 6<sup>th</sup>  
 CONTACT HOURS/WEEK: 2hrs

Internal Assessment: 40

End Term Exam: 60

S.No.	Contents	Contact HRS
1	Introduction to Design Process: Double Diamonds by the Design, Design Thinking Process, Human-Centered Design Process, T-Shaped Designers	3
2	Introduction to Design Research: Theoretical studies in design, Design discipline-specific research, User research, Cultural and historical research, Design pedagogy research, Design management research	5
3	Well Established Research Tools: Questionnaire, Focus Group, Interview, Observation & shadowing, Immersive Workshop, Case studies	2
4	Emerging Design Research Tools: Cultural Probe or Design Probe, Empathy Tool, User Forum, Video Ethnography, Participatory Design Game, Case studies	5
5	Strategic Design Management	5
6.	Branding & Design Touchpoints: Product scope, Product attribute, Quality/value, Uses/Users, Organization attributes, Local vs. global, Personality: human traits of the brand, Brand-customer relationships, Visual imagery, Brand heritage. Physique, Relationship, Reflection, Personality, Culture, Self-image	10

### References:

1. Delft University of Technology (2013) *Delft design guide: design methods*. Amsterdam: BIS Publishers.
2. Cooper, R. and Press, M. (2007) *Academic Design Research*. Design Council [Online] [www.designcouncil.org.uk](http://www.designcouncil.org.uk), Last accessed: 15/09/09
3. Blaxter, L., Hughes, C. and Tight, M. (2006) *How to Research*. New York: McGraw-Hill Education.
4. Beyer, H. and Holtzblatt, K. (1998) *Contextual Design*. London: Morgan Kaufmann Publisher.
5. Best, K. (2010) *The Fundamentals of Design Management*. Lausanne: AVA Publishing.
6. Wheeler, A. (2013) *Designing brand identity: A complete guide to creating, building, and maintaining strong brands*. Hoboken: John Wiley & Sons.

### Additional resources:

1. IDEO's Design Thinking: <https://www.ideo.com/pages/design-thinking>
2. RCA's Design with People: <http://designingwithpeople.rca.ac.uk/>
3. d.school's resources: <https://dschool.stanford.edu/resources>
4. Danish Design Centre: <https://danskdesigncenter.dk/en/frontpage>
5. Korean Institute of Design Promotion (KIDP): <https://eng.kidp.or.kr:8443/user/main.do>
6. Kootstra's Design Management Staircase Model: [http://lastrategiedesign.com/public/DME\\_Survey09.pdf](http://lastrategiedesign.com/public/DME_Survey09.pdf)
7. Design Management Institute: <https://www.dmi.org/>
8. Neumeier's articles: <https://www.martyneumeier.com/articles112619>

Head  
 Deptt. of Mechanical Engg.  
 RIMT-Institute of Engg & Tech  
 Mandi Gobindgarh

Director Academics  
 RIMT UNIVERSITY  
 Mandi Gobindgarh



Program: B. Tech. (Mechanical Engineering)  
 Department : Department of Mechanical Engineering  
 Year : 4<sup>th</sup> Year / 7<sup>th</sup> Semester

Contact Hours: 29  
 Total Credits: 22

S.No	Subject Code	Course Title	Subject Area	Credits	Contact Hours/Week			Exam Duration (Hrs)		Relative Weights (%)					Total
					L	T	P	Theory	Practical	CWA	LWA	MTE	ETE	EPE	
1	BTME-4701	Industrial Engineering and Management		3	3	-	-	3	-	16	-	24	60	-	100
2	BTME-4702	Refrigeration & Air Conditioning		4	4	1	-	3	-	16	-	24	60	-	100
3	BTME-4703	Mechanical Vibrations		4	4	1	-	3	-	16	-	24	60	-	100
4		Departmental Elective - III		3	3	-	-	3	-	16	-	24	60	-	100
5	BTME-4716	Open Elective II		3	3	-	-	3	-	16	-	24	60	-	100
6	BTME-4704	Refrigeration & Air Conditioning Lab.		1	-	-	2	-	-	-	60	-	-	40	100
7	BTME-4705	Mechanical Vibrations Lab.		1	-	-	2	-	-	-	60	-	-	40	100
8	BTME-4706	Major Project		3	-	-	6	-	-	-	150	-	-	50	200
<b>Total</b>				<b>22</b>	<b>17</b>	<b>2</b>	<b>10</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>900</b>

\*\* Major Project (BTME-4706) has been improved as per the suggestions received under DESINNO Project (European education standard required in HEIs, Design & Innovation capacity building in India through DESINNO Project - Nr.598404-EPP-1-2018-IN-EPPKA2-CBHE-JP)

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Director Academics  
 RIMT UNIVERSITY  
 Mandi Gobindgarh



SUBJECT TITLE: Major Project  
 SUBJECT CODE: BTME - 4706

Lecture (L)	Tutorial (T)	Practical (P)	Credit (C)
0	0	6	3

SEMESTER: 7<sup>th</sup>  
 CONTACT HOURS/WEEK: 6hrs

Internal Assessment: 40  
 End Term Exam: 60

S.No.	Contents	Contact HRS
1	<b>Data Analysis:</b> Persona, Scenario, Day in the Life, Process Analysis, PACT Analysis, Case studies	6
2	<b>Data Synthesis:</b> Processing, Visualizing, Interpreting, Quantitative Data, Qualitative Data, Integrating, Case studies	6
3	<b>Design Fiction &amp; Conceptualization:</b>	6
4	<b>Visualization (e.g. concept visualizing tools/techniques):</b> Optimize and Adapt for Scale, Define Your Indicators, Live Prototyping, Pilot, Roadmap, Explore scalability, Keep iterating	6
5.	<b>Design for Manufacturing (DFM):</b> Product cost vs. product price, Production volumes, Processes characteristics, Technical drawings (universal language), Computer Aided Design (CAD), Rapid prototyping and rapid tooling technologies, Computing simulation (e.g. FEA)	12
6.	<b>Costing &amp; Business Model:</b> Business Model Canvas, Value Proposition Canvas, Sustainable Revenue, Staff your project, Build partnerships, Mentor and evaluate, Capabilities quicksheet, Create a pitch, Funding Strategy, Keep getting feedback	12

**References:**

- Kumar, V. (2013) *101 design methods: a structured approach for driving innovation in your organization*. Hoboken: Wiley.
- Milton, A. and Rodgers, P. (2013) *Research methods for product design*. London: Laurence King Publishing.
- Bogers, M., Chesbrough, H. and Moedas, C. (2018) Open Innovation: Research, Practices, and Policies. *California Management Review*, vol. 60, no. 2, pp. 5-16.
- Ulrich, K. T. and Eppinger, S.D. (2016) *Product design and development*. New York: McGraw-Hill Education.
- Ashby, M.F. and Johnson, K. (2014) *Materials and design: the art and science of material selection in product design*. Oxford: Butterworth-Heinemann.
- Goller, I. and Bessant, J. (2017) *Creativity for Innovation Management*. Abingdon: Routledge.

**Additional resources:**

- Persona Dimensions: <https://www.servicedesigntoolkit.org/assets2013/posters/EN/P3-persona%20dimensions-A1.pdf>
- Empathy Map: <https://servicedesigntools.org/tools/empathy-map>
- Intervention/Provocation: <http://designingwithpeople.rca.ac.uk/methods/intervention-provocation>
- Roadmap (template): <https://www.servicedesigntoolkit.org/assets2013/posters/EN/F8-roadmap-A0.pdf>
- Prototype and Test (Test Preparation): <https://www.servicedesigntoolkit.org/assets2013/posters/EN/P7-test-preparation-A0.pdf>
- Design Factory Global Network: <https://dfgn.org/>
- Fab Academy: <https://fabacademy.org/>
- <https://www.thegeniusworks.com/wp-content/uploads/2016/01/Playbook-for-Strategic-Foresight-and-Innovation-A4.pdf>

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## Students enrolled for the Courses

### RIMT UNIVERSITY

DEPARTMENT OF RESEARCH, INNOVATION & INCUBATION

Details of Value Added Course / Design Innovation Courses

Title of the course	Expected outcome	Course content in brief	Course Coordinators / Trainers	Duration (Hrs)	Mode of Examination	Semester (Odd/ Even)	No. of Students Enrolled
Coding Skills using C/C++ - Beginner - (RDRI101)	<ul style="list-style-type: none"> <li>- Able to solve problems in computing using fundamental principles of coding.</li> <li>- Able to design, implement, test and debug basic C/C++ Codes so to implement algorithm for simple computing problems.</li> </ul>	<ul style="list-style-type: none"> <li>- Fundamentals of Programming and applications in real world</li> <li>- Introduction to C/C++</li> <li>- Tokens</li> <li>- Simple programs</li> <li>- Control statements</li> </ul>	Dr. Jasmeen Gill R.P. Singh	35 Hours	Practical/ Viva	Even	206 Diploma (2CSE, 4 CSE, 6CSE) B.TECH (4 CSE, 1 <sup>st</sup> YEAR) BCA(6 <sup>th</sup> ) B.Sc (Maths)
Coding Skills using Embedded C - Beginner (RDRI102)	<ul style="list-style-type: none"> <li>- Able to understand embedded system designs.</li> <li>- Able to develop simple embedded C coding for available Tools</li> <li>- Able to simulate on EDA/IDE</li> </ul>	<ul style="list-style-type: none"> <li>- Embedded C IDEs, EDA Tools</li> <li>- Understanding of Development Boards and Controllers</li> <li>- Interrupts, Instruction Set, GPIO programming, Statements, Port Mapping</li> <li>- Library Create, Delay, Functions, Loops</li> </ul>	R.P.Singh	35 Hours	Practical/ Viva	Even	66 Diploma (EE, ECE) B.Tech (EE)
3D Modelling Skills using PTC Creo - Beginner - (RDRI103)	<ul style="list-style-type: none"> <li>- Able to use PTC CREO Latest version</li> <li>- Able to build simple 3D Model Designs</li> <li>- Able to design components using different features</li> </ul>	<ul style="list-style-type: none"> <li>- Tools: Revolve, Thicken, Sweeps, Helical Sweep, Blend, Swept Blend, Datum Planes, Axes, Points</li> <li>- Tools: Hole, Draft, Mirror, Pattern,</li> <li>- Tools Helical Sweep, Swept Blend, Rib</li> </ul>	Ajay Singh Rana Dr. Munish Sharma Dr. Munish Gupta Dr. Pawan Yadav Dr. Parul Sahu	35 Hours	Practical/ Viva	Even	122 Diploma (ME, CE) B.Tech (ME, 4 CE)
3D Modeling Skills using Rhino - Beginner - (RDRI104)	<ul style="list-style-type: none"> <li>- Able to use Rhinoceros Latest Model</li> <li>- Able to build simple 3D Model Designs</li> <li>- Able to design models with free hand using different tools and commands</li> </ul>	<ul style="list-style-type: none"> <li>- Snapping Toolbar, Layer window, Setting up</li> <li>- Terminologies, Curves, Smart track, Tab, Fillet, Chamfer, Trim &amp; Split, Absolute, Relative, Polar Coordinates, Rotate Function,</li> <li>- Basic Lines Angle Drawings, Blends, Intersect, Project and Pull Functions, Rectangular and Polar Array, 1D, 2D, 3D Scale, Set Auxiliary Planes, Boolean Operations, Picture Frame,</li> </ul>	R.P. Singh	35 Hours	Practical/ Viva	Even	91 B.Tech (6 CE) Architecture (All Branches)

Tech. Head - DRI

Director Academics

Coordinator - DRI

## Proof by Certification



# Certificate of Completion

Ref. No. : RIMT/DRI/103/097 Date of Issue : May 31, 2022

It is to certify that PANKAJ KUMAR

Roll No. 19 - B-ME - 506 student of Depart. Of Mechanical Engineering

Programme of RIMT University has successfully completed the Certification/ Value Added Course/Skill Course titled

"3D Modelling Skills using PTC CREO" "Course Code" RDRI-103 " conducted by Department of Research, Innovation & Incubation in Association with DESINNO Centre of Excellence from Jan 25, 2022 to May 29, 2022.



Course Coordinator  
RIMT-DRI



Dr. M S Bindra  
Director Academics  
RIMT University



R.P. Singh  
Technical Head, DRI  
RIMT University



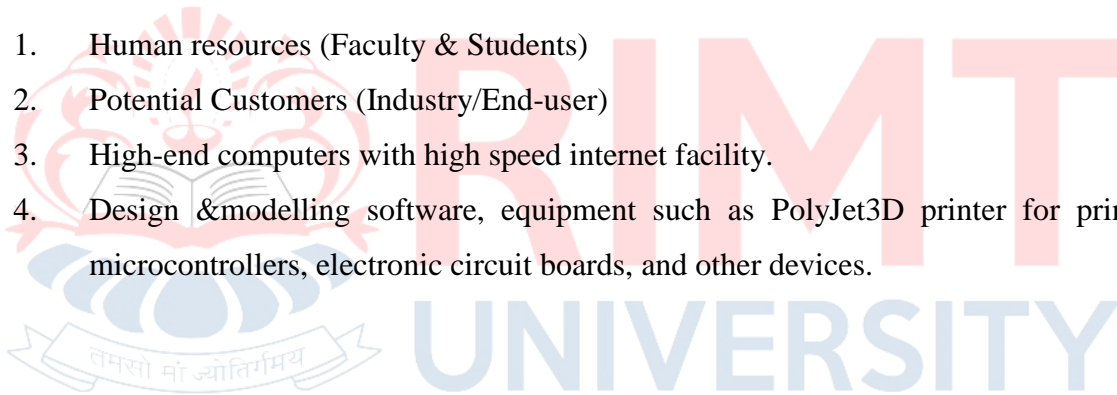
## **Problems Encountered and Resources Required**

**Following are the major challenges:**

3. Maintaining the balance between the faculty time-table and the schedule of training from international bodies.
4. Identification of interesting and potential students.
5. Developing advanced skill set in students along with fundamental academic courses.
6. Making connections with the industry.
7. Identification of actual problems in industry and empathising with the end-user.
8. Meeting project completion deadlines.

**Resources required:**

1. Human resources (Faculty & Students)
2. Potential Customers (Industry/End-user)
3. High-end computers with high speed internet facility.
4. Design & modelling software, equipment such as PolyJet3D printer for printing, microcontrollers, electronic circuit boards, and other devices.





**RIMT**  
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**A REPORT BY RIMT UNIVERSITY**

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**BEST PRACTICES**