



**Gujarat Technological University (GTU)**

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# GTU Student Start-up Policy



**GTU Policy based on:**

**CUBE (College & University Based Entrepreneurship) Model**

*November • 2014*

*GTU Student Start-up Support System (S4) : GTU Innovation Council (GIC) : GTU Community Innovation & Co-Creation Centre (CiC3)*



## EXECUTIVE SUMMARY:

More than 94 % engineering students are now in affiliating-type universities in India. On the other hand all the national innovation and start-up policies cater to the segment of single campus/residential engineering campuses like IITs, NITs etc. Therefore if the majority of engineering students are not to remain outside the ambit of national start-up policies, a Student Start-up Policy for such universities is very essential.

From the available demographic data, it is evident that, to satisfy the need of university graduates, India needs to create nearly 1 million jobs every month for the next decade. While the public sector industries and large private sector industries would play their role, jointly they would be able to create only a fraction of the requirement. The only way to address this problem is to promote student start-up culture across the universities.

The Union and State governments are focusing on a skilled India. It has been seen that students, who have gone through exposure of entrepreneurial endeavours, understand the importance of learning practical technological as well as soft skills and graduate out with much better skill-sets. In a University, where the number of successful entrepreneurs increases, it is observed that the entire cohort of students start showing a greater interest in acquiring necessary skills. It has been seen that enterprise education/ exposure and potential for better employment are correlated. Thus through the proposed student start-up policy, the State Universities will be able to contribute significantly to the skilled India mission of the Honourable Prime-Minister.

**Gujarat Technological University (GTU)** has made extensive efforts in building an innovation and entrepreneurial culture at GTU during the last 4 years. GTU has developed interventions, which are organically linked to its pedagogical work. In India, GTU is the only large technological university, which has developed its own Student Start-up Policy. The Policy is based upon the experience of GTU's own successful efforts and it has also drawn upon the best practices from across India and abroad.

The Policy aims at supporting existing student start-ups, while nurturing new and fresh student start-up ideas, and helping students convert their ideas into business enterprises. By implementing this policy, the University aims at generating every year over 1 lakh student start-up ideas. The University then aims at converting at least 10,000 ideas into proof of concepts, leading to at least 1,000 student start-up enterprises every year.

GTU's student start-up policy, called CUBE, has been formulated to cover **three axes**:

**Interventions:** Pedagogical, Co-curricular, Social; **Intensities:** Culture Development, Infrastructure/funding & resource based Special/dedicated support initiatives for startup spin-offs and **Implementation Scope:** Campus Level, Local Community (Virtual) Level and University Level. It aims at the following:

**Create 10,000 successful startup in the next ten years and establish Gujarat as start-up state of India:** GTU will create 100,000 students' project-based start-ups in the next ten years. With the assumption of a modest 10% success rate, it will lead to creation of 10K start-ups. For this, GTU will be providing 20,00,000 sq. ft of incubation/co-working space all across the state for student entrepreneurs in the 25 Incubators in the GTU Innovation Sankuls<sup>a</sup> and the Innovation Homes<sup>b</sup>. GTU is developing a hub & spoke model at GTU & at Institutes, extending its capacity building facility across the state.

**Strengthening creation of Knowledge economy:** University will contribute towards building a knowledge economy by increasing its Intellectual Property (IP) creation rate to file 50% of the patents from the State through its research and innovation initiatives. At GTU, a highly successful Student Start-up Support System (S4) has been established and it is helping establish a S4 Extension Center at every Institute for providing pre-incubation entrepreneurship program to all the 500,000 students. GTU will also increase the commercialization rates of research output by targeting a higher commercialization rate of 10% of successful patents through venture creation and start-ups.



**Create 1 million jobs through start-ups in the next ten years and support for MSMEs in Gujarat:** The 10K Start-ups will create 1 million new jobs, through 100 new jobs (indirect & indirect) per start-up, in this startup sector alone. Pedagogical and co-curricular interventions are being provided at GTU and will be strengthened so that these are available in-situ to the students, of all streams, across the State. GTU has embedded start-up learning into its syllabus and will provide special academic incentives to start-ups. It will also encourage colleges to adhere to a Common Minimum Infrastructure for entrepreneurship development. IP Workshops across the State and Patent Clinics at GTU are available to the entire GTU community, including to the SMEs, working with our students, Faculty Members and Colleges. The innovation movement at GTU will help grow local SMEs, as they learn to work intensively with the Colleges, which jointly have highly qualified 17,000 Faculty Members.

**Add 9,000 crores to state GDP through this start-up sector in the next ten years:** New jobs created through the start-ups will lead to addition of \$1.5 billion in salaries and economic activity.

**Attract 18,000 crores of external investment to this start-up sector:** in the State in the next ten years through investments in start-ups. 10K Start-ups will be groomed to reach a valuation of \$1 million each and attract investments through VC, institutional investors and capital markets. GTU wants to initiate a university level angel fund, to provide much needed angel funding to student startups at pre-incubation stage. GTU will create partnerships with local & national bodies create two way access to start-ups in the State with external stakeholders. GTU will also create special Sectoral Incubators in the state in partnerships with companies under a PPP model to further attract funding and market access for its start-ups. Through its Alumni network, GTU will also create launch-pads for its startups in other places in the country to access more external investors & markets.

**Help other universities in capacity building for similar interventions:** GTU will share its evolving policy framework with other state universities, as well as other Universities, who wish to institute similar ecosystems in Gujarat and in other states. GTU will develop new benchmarks for measuring startup activities in affiliated colleges to create a system of outcome-based interventions and it will put them in the public domain to permit its wider application in India.

<sup>a</sup> *Sankul is a Sanskrit word, which means a Community. GTU has established 25 GTU Innovation Sankuls, all across the State. The Principal/ Director of every College, affiliated with GTU, is a Member of the Sankul Committee in its area. Leaders of the industries in the area are also on the Committee. Every Sankul is designed to develop a close interaction between the students and Faculty Members and the industries.*

<sup>b</sup> *An Innovation Home is a 5,000 sq ft each is to be set up in every one of the 317 Colleges, which have students hostels. The Home will provide a place where budding entrepreneurs will be able to stay and work. The Home will provide common facilities like a seminar room, laboratories and offices.*

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# 1.

## The Environment at GTU

A University is required to convey, from one generation to the next, the accumulated knowledge by humanity after critically examining it for its relevance and veracity. A University community is supposed to welcome every new idea and rigorously evaluate its truth by using all the available tools. Hence Universities are usually the places, where new ideas are discovered and new invention are made. Therefore more innovative are the universities, more creative are the societies in which the universities are located.

**A.1 Administrative Support for Research & Development:** Whatever measure may be used for the research output of a university, we have to accept the fact that even our best universities today are much less innovative than even a middle-level university in the first world. There are many reasons for this lacunae. One reason is that our university structures are not designed for facilitating research. Nor are these designed to promote excellence in 'teaching processes' by using today's tools. Functionally the university system in South Asia has been designed for organizing a centralized examination system, which can deliver passports (called degree certificates) for government jobs.

In the developed part of the world, university communities have become highly stimulating and generate many useful ideas, products and processes. To sustain such communities, governments, public trusts and industries have set up systems for supporting research at universities. Universities have conditions of service and environment where a Faculty Member cannot survive without doing meaningful research. Administratively, every university has the office of the Vice-President (Research). The essential components of the office are Intellectual Property Rights (IPR) cell and entrepreneurship unit besides a large component, which facilitates the university community to access the resources for research. Many universities have associated incubators. Such incubators are usually independent entities. But the Boards of university incubators are usually chaired by the Vice-President (Research). That the activities under a Vice-President (Research) are an essential requirement for a university is accepted by everyone concerned in the developed world. As the competition among the nations has become more intense, the discussion is usually about strengthening the office of research further. Universities usually can change the number of Vice-Presidents according to the needs. Thus as globalization at universities has increased, many universities have added a Vice-President (International) to its set of officers.

In India, the statutes of universities have no provision for a Pro-Vice-Chancellor (Research). Moreover a State University cannot add such a position, since the Acts, under which the universities are established, do not leave much of an authority with the universities for being able to create their own administrative structures for adapting and equipping themselves to be able to cater to the needs of the dynamic world of today. This can only be done by changing the statute of the university by the legislature. Nor will the society, which includes association of university teachers, courts and popular governments, work to create a more conducive set of service conditions for incentivizing research. Similarly due to insufficient understanding of the needs of the universities of today, the administrative systems of the government fail to provide the necessary facilities or financial autonomy to their State universities.

However time does not stop moving ahead till our society understands the requirements of its State Universities. Hence in spite of the handicaps, the universities must continue to serve the needs of the young.

GTU, therefore, has set up an entrepreneurship sensitization program, pre-incubator boot-camps, a very active Student Start-up Support System (S4), a working space for budding entrepreneurs called S4- Co-Creation Center (S4-C3), a highly active IPR Cell, which has trained about 4,400 Faculty Members about basics of patenting and which helps students and Faculty Members to apply for patents through its Patent Clinics and a Facility like the Tinkering Lab of Cornell or the Fab Lab of MIT for students and alumni to develop products of interest to them in after-hours and on holidays. To manage all these activities, GTU Innovation Council (GIC) has been set up and it is today by far the most active innovation council in India.



GIC works to create institutional and industry linkages on a sustainable basis. GIC has set up 25 GTU Innovation Sankuls, spanning the whole of Gujarat. Each Sankul is centered at a major industrial estate. The first industrial Shodh Yatra was organized on 14th February 2011 to SMEs in Naroda Industrial Estate, Ahmedabad so that students could visit the factories in the estate for scouting for problems for their Final Year projects. Every student is encouraged to work on improving a product or a process, which is of interest to some industry or which serves some social need.

**A.2 Universities, MSMEs and New Technologies:** An MSMEs is usually started by someone, who has learnt or developed some new technology and is able to manufacture a product competitively. If it does not grow fast to become a bigger industry, it would not have the competence and resources for establishing a full-fledged research and development center. Hence such an industry, without continuous up-dation of technology, may become non-competitive. Hence it is important that such industries develop a close relationship with Universities, so that after signing a Non-Disclosure Agreement (NDA), the laboratories and workshops of the University or its affiliated Colleges can be used as the development centers for MSMEs. This will be mutually beneficial, since it would make the research and development work in the University and the Colleges more relevant to the needs of the society.

Through GTU Innovation Sankuls, GTU has created a structure so that the Colleges can develop a close relationship with the industries. Today more than 70% of the Final Year projects at GTU are based upon problems from MSMEs. Moreover the industries are invited in every semester of the Final Year to an Open House exhibition of the students' work and the industry professionals are asked to evaluate the Final Year projects.

Every College and the University have well qualified Faculty Members. The basic technical competences of more than 17,000 Faculty Members in the GTU system constitute a highly valuable resource, which is not being utilized by the industries in India. As mutual confidence develops between industries on the one hand and the Colleges & the University on the other, NDAs may start being signed and the MSMEs, the University and our country may start benefiting from research and development in the workshops and laboratories of the Colleges and the University.

As the Faculty Members start working on problems, generated on the shop-floors of MSMEs, their capacity to effectively mentor start-ups of students will grow. This virtuous cycle of help to the industry through research and development by the highly qualified Faculty Members, of improvement in the competence of our Faculty Members as they work on relevant research will lead to world-class Faculty Members. Then Indian MNCs will not have to go to foreign universities only, whenever they need help at the frontiers of technologies. Thus when Vishal Sikka, CEO of Infosys wanted Infosys's top engineers to develop an insight into Design Thinking, he had to go to Stanford University and University of Berlin only.<sup>1</sup>

SMEs drive job creation for the first five years. If India has to create one million jobs an year for the young, we have to not only strengthen the linkages of SMEs with universities so that the huge gold-mine of qualified Faculty Members can provide the necessary research for keeping the SMEs afloat in the tough and competitive market places of the world, universities must work to facilitate the creation of new SMEs continuously. So the universities must design for entrepreneurship.<sup>2</sup>



**A.3 Technical Education in India:** Karnataka led the country in developing self-financed engineering colleges. The data from Karnataka for 2013: 18,861 engineering seats have remained vacant at the end of the second round of counselling of the Consortium of Medical, Engineering and Dental Colleges of Karnataka (COMEDK) quota and the Karnataka Examinations Authority (KEA). Out of the 161 colleges, in which seats were available for students during the second round under the COMEDK, all seats have been taken only in 22 colleges. On the other hand, there are at least 45 colleges where the number of seats remaining is in double digits. And, in one college there are 287 engineering seats vacant.<sup>3</sup> This is due to the under-employment of engineering graduates. Similarly seats in engineering colleges all over the country in every state are beginning to remain unfilled. However on 26th September 2013, at a Seminar on 'National Vocational Quality Education Framework' at Ahmedabad, the Chairman AICTE said that Graduate Enrolment Ratio in India was still much lower than that of the developed world and it was even lower than that in China. Many HR managers of large companies complain that they were not able to get talented engineers.

If the facilities, created in various states, are to be used optimally, universities will have to understand why the statements of policy makers seem to be at odds with the situation on the ground. GTU feels that this requires Universities to keep their syllabi continuously up-dated and to involve industries and businesses in estimating the requirements during the next decade. It also requires a continuous stress on practice-orientation and skill development as an integral part of the syllabi. Along with it, the Faculty Members will have to be provided opportunities to obtain better practical experience through better equipped laboratories and workshops and to work in industries.

<sup>1</sup>*'Vishal Sikka urges Infosys staff to apply Design Thinking': Report in Economic Times dated 16th August 2014, available at:*

[http://articles.economictimes.indiatimes.com/2014-08-16/news/52873785\\_1\\_vishal-sikka-infosys-staff-rajiv-bansal](http://articles.economictimes.indiatimes.com/2014-08-16/news/52873785_1_vishal-sikka-infosys-staff-rajiv-bansal)

<sup>2</sup>*Extracts from the Key-note Address by Shri Kris Gopalakrishnan, co-founder of Infosys, at the national workshop on 'Development of Policy Framework for Innovation, Student Entrepreneurship and IPR' at the Gujarat Technological University on 22nd November 2014, as reported by Business Standard dated Sunday, 23rd November 2014, available at:*

[http://www.business-standard.com/article/companies/best-time-to-start-a-new-business-says-infosys-co-founder-114112200838\\_1.html](http://www.business-standard.com/article/companies/best-time-to-start-a-new-business-says-infosys-co-founder-114112200838_1.html)

<sup>3</sup>*"18,861 engineering seats in State remain vacant", as published in The Hindu on 26th July 2013 available at:*

<http://www.thehindu.com/news/national/karnataka/18861-engineering-seats-in-state-remain-vacant/article4954014.ece>



# 2.

## A Note on Innovations in Engineering Education at GTU

Gujarat Technological University (GTU) was established in 2007 as an affiliating type State University by the Government of Gujarat. GTU caters to the entire field of Engineering, Pharmacy, Business Studies (MBA programs), Computer Applications (MCA) and Architecture. Today the University has about 500 colleges affiliated to it with 5,00,000 students. It is today the largest University in Gujarat.

As a multi-disciplinary university it is offering 34 PG, 38 UG and 27 Diploma programs. The University has a robust Doctoral and Master's program. 123 doctoral students have an eminent foreign Professor as a Co-Supervisors, in addition to their local Supervisor. The 53 Professors from foreign Universities have been given the designation of Adjunct professors at GTU. GTU's unique system of Mid-term and end-year review of thesis is designed to provide continuous mentoring from national experts even while the research students are working on their thesis.

To promote research, GTU has established 14 PG research centers. Some examples of the Centers are Mobile Computing & Wireless Technologies, Environmental & Green Technologies, Cyber Security, Global Business Studies, Pharmaceutical Studies and Drug Delivery Technologies, Industrial Design etc.

GTU Innovation Council is the most active Innovation Council in the country with about 500 industry leaders as members of its 25 regional committees and working jointly with Principals/Institutes for enhancing the industry-institute inter-action.

GTU may be today the University having the largest number of result oriented initiatives and activities in learning systems including the activities for Innovation, IPR & Student Start up, internationalization etc. as compared to any other University in India.

**B.1 Practice-orientation and Technological Skills:** Whatever measure may be used for the research output of a university, we have to accept the fact that even our best universities today are much less innovative than even a middle-level university in the first world. There are many reasons for this lacunae. But the basic fact is that our university structures are not designed for facilitating research. Nor are these designed to promote excellence in 'teaching processes' by using today's tools. One reason may be that there is no incentive for doing good research. Thus in April 2014, in an article titled 'China's Rise in Higher Education, a perceptive observer from Bangalore pointed out<sup>4</sup>," ".....the governance structure at these institutions (IITs, IIITs and NITs) incentivises the best faculty to become administrators, in which positions they have no time for research or effective teaching. A different approach that privileges teaching and research, and keeps administrative loads low for good faculty, as China appears to have done, may be a solution." Another reason is a near-total bureaucratic control of even the nominally autonomous educational institutions.

GTU has introduced practice orientation and a stress on building soft skills and, in a limited way, technological skills. It has empowered the Faculty Members in Colleges by granting in most of the courses as much as 60% marks to them for progressive evaluation and assessment of term-work and Laboratory/ workshop work and leaving out about 40% marks for end-semester examination.

**B.2 Design-Based And Project-Based Learning System at GTU:** On 2<sup>nd</sup> February 2012 (The first cohort of 4-year degree engineering students graduated out in May 2012.), GTU started the process of updating its syllabi. It was decided to develop a design-based learning system. (In Chemical Engineering and in IT, one uses the term 'Project-based Learning' for a similar idea.) So design orientation has been embedded into the new syllabi from July 2013 and open-ended problems were included in the practical work. A strong 6-semester spine of design engineering has been included in the syllabi. On 9<sup>th</sup> January 2014, experts in design engineering from all over the country were invited to present their views on how Universities could permeate design engineering into the whole of the engineering syllabi. At GTU, the processes of designing the project at the Final year and of the spine of Design Engineering, from third to eighth semester of degree engineering programs, have been synchronized in the interest of seamless progression of learning.



Design thinking based curricula have been introduced in the 3<sup>rd</sup> Semester of Degree Engineering in GTU from 2014-15. More than 50,000 students have used a framework developed by OpenFuel and have implemented every step from empathization to ideation to product development .

In July 2014, GTU has become the Director for India on the Asia-Pacific Engineering Network (APEN). APEN has been working to introduce project-based and design-based learning systems in the engineering education systems of East Asian countries.

B.3 GTU's Innovation Council (GIC): GIC was established on August 2, 2010. The Final Year project in degree engineering and research work at Universities leads to most of the innovative technology companies in the world. GIC coordinates the work of (i) GTU's Student Start-up Support System (S4) established on 25<sup>th</sup> February 2012, (ii) study of IPR instituted from 3<sup>rd</sup> September 2011, (iii) the S4 Co-Creation Center (S4-C3) established on May 1, 2013, (iv) GTU's ShodhYatras (The first ShodhYatra was organized on 14<sup>th</sup> February 2011) to SMEs and (v) the structure of GTU Innovation Sankuls<sup>3</sup>. GIC is one of the most active University Innovation entities and S4-C3 continues to serve the students and alumni 24/7, all through the year.

Under GIC, twenty-five GTU Innovation Sankuls have been established between 2<sup>nd</sup> August 2010 and 14<sup>th</sup> February 2011. The Sankuls are being run successfully since 14<sup>th</sup> February 2011. The Principal of every College is a member of the Sankul Committee in its area. In April 2011, every College and Polytechnic, affiliated with GTU was asked to establish a GTU Innovation Club<sup>5</sup>. The Club helps the Faculty Members and students of the College to develop a close inter-action with industries, through the Sankul Committees.

⇒ The Sankul movement has been so successful that more than 70% of Final Year Projects are based on problems obtained from SMEs every year since 2011-12;

B.4 Student Start-up Support System (S4): GTU is organizing student start-up activities on a hub and spoke model at the University and at Colleges.

The S4 Co-Creation Center (S4-C3) has a common seminar room facility and has more than 10,000 square feet of space. Additional space of 10,000 square feet for providing offices to budding enterprises in S4-C3 is being prepared.

S4 has launched many flagship programs like 'Entre-weekend, S4 boot camps, S4 social entrepreneurship boot camps, Start-up Leadership Program (SLP), Start-up Analysis, S4 Fellowship Program, Start-up Policy Roundtables' etc.

S4 brings in local entrepreneurs of the region and the sector to mentor and guide young student entrepreneurs regularly.

S4 Co-Creation Centre (S4-C3) is serving the students' needs around the clock, right from hatching their ideas to take them to market.

S4 has realised the need of deep culture of pre-incubation system and need of pre-angel level funding mechanism for student innovations. S4 has pioneered the concept of CFI-Crowd Funding Initiator with help from local crowd funding platform like Start51 and other national knowledge ecosystems.



⇒ S4 programs at GTU Innovation Council in Ahmedabad fetch nearly 3000 students per quarter and give them exposure to technology entrepreneurship and help the emerging teams to setup their student venture. Today S4 is the most active start-up system out of such systems at universities, with regular event every day of the week.

S4 also has taken crucial lead in the nation for advocating suitable policy interventions at state, university and college level. It has hosted national conferences, workshops, symposium and roundtables to discuss and deliberate on the need and to develop strategies and implementation pathways to make it happen at grassroots level. This is first of its kind largest intervention to promote student start-ups in India.

**B.5 GIC Work in Colleges:** Besides the GTU Innovation Clubs in every College, Open Source Technology Clubs have been established in 77 Colleges across the State. In 22 out of 25 Sankuls, Nodal Centers for the Open Source movement have been set up. Mobile and Wireless Technology Clubs have also been established in 30 Colleges.

S4 Extension Centers are being established in all the Colleges.

GTU's Policy on Start-ups requires that each one of the 317 Colleges, with hostel facility, should have an Innovation Home of 5,000 sq. ft. to house budding entrepreneurs. At an Innovation Home, the entrepreneurs will stay and will have common facilities like seminar room, offices, library and laboratory. In addition they will be able to use the laboratories and workshops of the College. The students from the Colleges will be able to work as Interns and the enterprises could use the services of the Faculty Members as Consultants.

**B.6 Community Innovation & Co-Creation Centre (C-i-C3):** On 1st May 2013, a common laboratory, where students and alumni can work to develop their own products, was also established in a 1,500 sq ft of space adjoining S4-C3; The Lab is available after-hours and on holidays; It has a stream of mentors and geeks from the local community; The Lab is called Community-innovation-Co-Creation Center (C-i-C3); C-i-C3 is designed to have facilities like those in the tinkering lab of Cornell University plus the Fab lab of MIT.

C-i-C3 is a part of the Sankul movement. Each C-i-C3 is responsible for supporting the activities under the following areas:

1. S4 Extension Centers
2. Hardware Design Innovation Co-Creation Center
3. Open Source Technology Clubs
4. Mobile Technologies Clubs

As the Lab attracts progressively greater usage by the students, the University will add modern facilities like 3 D printers, 3 D scanners etc for fabrication of prototypes by students

GTU proposes to establish C-i-C3s during 2014-15 in ten of the Sankuls. It proposes to establish 15 more C-i-C3 in 2015-16 so that each one of the 25 Sankuls will have one. This will provide facilities for a student or an alumni to have facilities for developing a product all across the State.

Each C-i-C3 will be associated with a Technology Skill Development Center. For the first five C-i-C3s, the industries department of Government of Gujarat has, in principle, agreed to provide financial help for Skill Development Center in the area of Telecommunication Technologies.



A Sankul's C-i-C3 may be set up in those Colleges, which are prepared to provide space and residential facilities for the employee. In addition hostel facilities for students from other Colleges will be required. The college may be located in an area, which is easily accessible from major population center. The College should have a working hostel for boys and girls and it should be possible for the Center to work after office hours, since the students will work on their projects after their classes. For upto 30 students, the College should agree to host them in the hostels.

Since its inception a dedicated team of University and teams from Techpedia have steered the movement to success from scratch while developing a distributed and frugal innovation ecosystem. Techpedia has been extending voluntary support to this one of its kind initiative in India since its inception.

**B.7. Skilling India Mission at GTU:** GTU has established at every College/ Institution affiliated with it, a GTU Innovation Clubs and S4 Extension Centers. Besides specific Technology Clubs like OSTCs and MWTCs have also been established.

With each C-i-C3 will be associated one technological Skill Development Center (SDC). The first five Centers, which are being established, are on the skills required by the Telecommunication industry. These will train Skilled workers according to the prescribed syllabi, prepared by National Skill Development Corporation. Since the SDCs have modern equipment, the like of which is not available at engineering colleges, at week-ends, the SDCs will provide training to engineering students of Colleges, affiliated with GTU, in batches of 30 students.

In Engineering Colleges, workshops on Machining and Fabrication, Carpentry & Fitting, Welding, Foundry, Automobiles, EME (IC engines, boilers, engines, gas turbines and steam turbines), refrigeration & AC, CNCs, Robotics, PLCs & Sensors etc are required. However these workshops are usually of elementary nature. GTU proposes to establish five Skill Development Centers (SDC) in each of the trades, which are a part of the engineering curriculum. Each of the SDCs will train skilled workers. Moreover these will provide training to students of engineering. Lastly these SDCs will be manned by technician trainers as well as professors, who will do research in these technologies. Thus if GTU has ten professors in the five zonal SDCs in the area of welding, they will study the technologies of welding and will work to develop new technologies indigenously.

#### **B.8 IPR Initiatives at GTU Innovation Council**

During the last three years, GTU has conducted 43 different workshops on Patent and IPR issues. 4,421 Faculty Members and a large number of students have participated in these workshops.

**B.8.1 Boot-camps and Hands-on workshops for faculty members for Patenting in Engineering & Pharmaceutical science:** launched on Sept 3, 2011 and designed to give exposure about Intellectual Property Rights (IPR) and various associated instruments, which can be used to protect IPR at various stages of innovation: Till now, 4,421 Faculty Members in Engineering and Pharmaceutical sciences have been trained through this flagship program.

**B.8.2 Patent Search and Analysis Report (PSAR):** launched by GTU in September 2013, with the objective of avoiding repetitive kind of projects: In this activity each student of 7th Semester BE is asked to study at least 5 patents related to his/ her project and has to prepare Patent Search and Analysis Report (PSAR). Through this activity more than 35000 students have studied more than 1,78,000 patents in a period of four months during the academic year of 2013-14.



**B.8.3 Patent Drafting Exercise (PDE):** For students of final year BE: Every team of students is asked to draft a provisional patent documents for their final year project considering its Innovativeness & Patentability. All students are taught about provisional patent drafting, filing procedure (for various patent filing forms (1, 2 & 3)), steps & fees and other required details. This activity is also carried out through a specially developed web portal by GTU Innovation Council to cater to the need of 50,000 students at a given time period.

Due to PSAR and PDE like interventions, GTU became the highest IP literate State Technological University in the nation within a short span of three years.

**B.8.4 Patent Clinic:** A unique initiative started by GIC to provide assistance to students, alumni and Faculty Members from any branch of science or technology, to file patent for his/her innovative work or project. Patent Clinic is a two days' workshop in which GIC organises workshops on Basics of IPR/Patents, Prior Art Search (PAS) Techniques and its importance, Patenting Systems in India and Hands-on exercises to draft patents. The whole value chain of patent search for novelty checking of any project is carried out using free and paid patent databases. The access to paid databases is provided by some resource partners in pro-bono basis. Till today nine such sessions of such patent clinic have been organised as a outcome of which more than 50 patents have been filed during this year.

**B.8.5 PatenTrack:** To promote innovative culture among students and awareness about IPR, GIC has started PatenTrack competitions: It is aimed at spreading awareness about importance of patents, to make students aware about various patents filed in different country by different individuals and institutions. It helps to develop a habit before doing research and innovations as a part of their academic needs and hobby projects. PatenTrack is a two days competition, where in patent search by students about the portfolio of assigned innovative companies or of assigned technologies. It is followed by group discussions among participants on current IPR topics & presentation of analyzed patents by each group during the activity. This helps students to understand the cutting edge innovations attempted by various industries, individuals and organizations in different time at different geography.

**B.8.6 Post Graduate Diploma in IPR:** To increase the availability of skilled human resource that is not only technically sound but also having in-depth knowledge of IPR and patents, GTU has launched a one year, off-campus programme on "Post Graduate Diploma in IPR" from September 2014.

### **B.9 Some Comments about the terminology used in the Policy:**

This policy discusses the ideas of Innovation Homes and Campus Company Programs, besides discussing the ideas of Co-Working spaces, incubators and accelerators.

In its MBA program, GTU offers the specialization of Entrepreneurship and Family Business, which has subjects like Entrepreneurship, Women & Family Business, Creating and Leading an Entrepreneurial Organization and New Venture Creation- Family Business Expansion.

One of the most successful incubator at universities is at Waterloo, Canada. Many companies, including IBM and Google, have opened large research laboratories right on the campus. Many post-graduate students do research and many professors hold dual appointments in the research lab and at the University. A large number of under-graduate students work as interns.

When a University requires its students to complete one or two semester training in an industry before award of a degree, they usually accept internships in Companies on the Campus or in the offices or laboratories at Innovation Homes.



IIT Madras has a **Research Park**, located adjacent to the IIT. The Park has a separate Board, chaired by the Director of IIT Madras. Many companies have established their offices and laboratories in the Park and they are charged a commercial rental. However if a company were to hire the IIT's under-graduate students and research students and / or it uses IIT Professors as Consultants, the companies are given a discount in the rental amount. Nearly every company in the Park uses students and services of Professors.

For Research, Consultancy and for incubating start-ups, I.I.Sc. Bangalore has a Society for Innovation and a fully owned not-for-profit **Section 8 company**. The company permits the receipt of equity in start-ups more easily.

The next few pages describe GTU's Start-up Policy. The Policy has a focus on 3 Es, namely **“Engineering, Entrepreneurship and Employability”**.



<sup>4</sup> <http://www.college-builder.com/index.html>

<sup>5</sup> *The GTU Innovation Clubs were earlier called Udisha (Universal Development of Integrated Skills through Higher Education) Clubs.*



# 3.

## Policy

### Role of University

#### I. Pedagogical Roles

- I.1 GTU S4 will set up a policy incubator where various policies will be discussed, debated and will be put under pilot testing mode; these policies will be related to student startups in general and other similar areas. The policy incubator will hold dialogues, discussions, and conferences to assemble wider perception and learn from best practices. It shall then develop the next practices for student entrepreneurship across state university systems.
- I.2 Student startups having one or more female co-founder(s) will be extended preference in selecting the incubatees.
- I.3 The incubation policy will cover incubation facilities for all students and alumni, irrespective of their streams.
- I.4 GTU will create indicators to measure and rank all the affiliated institutes for the campuses and departments. The Annual Student Start-up Index will put equal stress on process and output driven indicators along with structures and outlay driven indicators. The campuses thus can be widely categorized as
  - A) Campuses where efforts and activities are being made to instill a startup culture
  - B) Campuses where startup culture has led to startup infrastructure
  - C) Campuses where student startups have come out as spin offs from the previous two steps

GTU will create an easily understandable ranking system, including the Student Start-up Index, in accordance with the accreditation systems in India and the world to help colleges to move towards accreditation. This would include the work and the outcomes in student start-ups/ faculty ventures, patent / IPR/ tech transfer, besides the usual academic and outcome-based criteria.

GTU will work with the institutions to build special ecosystems at all the campuses.

- I.5 GTU's startup policy aims at generating 100,000 student startup ideas every year. Out of these, the policy aims to help convert 10,000 start-ups into proof of concept and eventually, lead 1,000 of these student startups into successful and scalable enterprises. The policy aims at encouraging enterprises, which serve social and economic needs.
- I.6 GTU will bring pedagogical interventions like permeating design thinking into the entire syllabi of all its courses, and innovation and entrepreneurship programs in practice mode. The university will facilitate start-up processes by seamlessly integrating the incubation value chain into the academic programs in order to have early exposure of incubation value chain to potential student start-ups.
- I.7 A student or a Faculty Member will also be permitted to apply for approval of a special elective, designed especially by the student or the Faculty Member. This will permit the student-entrepreneurs of scalable start-ups to opt for special elective subjects on innovation, entrepreneurship and/or other relevant subjects, as required by these budding entrepreneurs.
- I.8 All colleges will be encouraged to develop specified Common Minimum Infrastructure and host Common Minimum Activities as specified by the University.



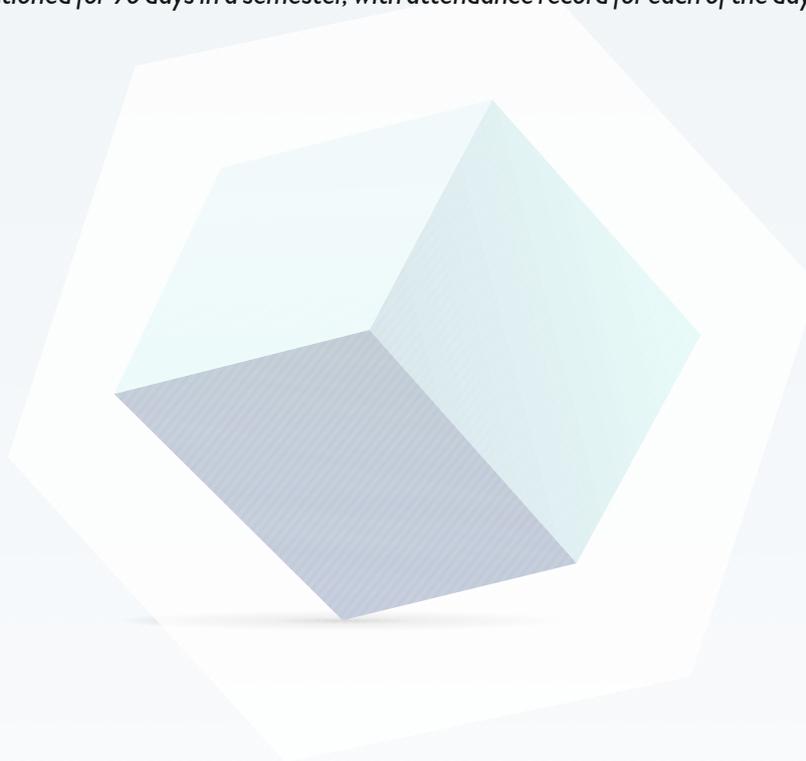
- 1.9 Final year students of GTU will be required to take a practical problem applicable in real life, and solve it as a part of academic curricula through their final year project.  
The students, who have completed the best of such projects and who want to convert their projects into products/services and want to set up start-ups, will be supported through S4 at GTU. The University will extend training and basic facilities to help its innovators file patent applications through its Patent Clinic program.
- 1.10 Final Year students develop their projects usually in groups of 2-4 students from a similar discipline. GTU will permit inter-disciplinary projects and such teams may consist of students from more than one branch of Engineering. For such a project, there will be a faculty Guide from each of the concerned departments and the guides will work together to support the project.
- 1.11 Students may be permitted to develop their ideas and their products at Technology Business Incubators (TBIs) or Accelerators or Companies on the Campus (CoC), if these entities, have been certified by GTU. Wherever the syllabi require the students to make presentations and/or give seminars, students may be permitted to make their presentations at the Open House and present their project seminars at such TBI or Accelerator or CoC, where they are working for their project. The mentors from Incubator/Accelerator/CoC can act as an external project/thesis Guide. In such a case, the TBI or Accelerator or CoC will be required to furnish full information about the project and the students along with the names of the Mentors for the Project to the University, the Principals of the Colleges and to the HODs in the Colleges, within three weeks of the start of the semester.
- 1.12 If a College wants to use some of the Massively Open On-line Courses (MOOCs) as a part of the syllabus, Colleges will be advised to choose appropriate online courses (MOOCs) as electives and apply to the University, under the existing academic regulations. Student can choose various minor projects, MOOC based certification programs, assignments in place of regular assignments in particular subjects, under internal evaluation by a Faculty Member, assigned by the Principal of the College.
- 1.13 GTU will facilitate start-ups by its alumni (within normally 3 years of graduation) under its flagship programme called Entrepreneur-in-Residence (EiR). EiR candidates will be selected by the University on the basis of an intensive review of each project submitted for this scheme. A monthly stipend of INR 20,000 as a Research Assistant may be given to such EiRs for a period of up to 11 months.  
The selected candidate will be required to function from a University office/ facility on day-to-day basis and may be required to mentor various start-up related programs for the University. If the performance of an EiR is not found to be satisfactory, the University may terminate the Research Assistantship on any day. In case it is a team of students and or alumni who are working on developing an enterprise, the team may be considered as an EiR. In such a case, the University may decide to give an appropriate amount of Research Assistantship to each of the team members.
- 1.14 Student Start-ups or Alumni startups (within 3 years of graduation), which have made an extraordinary impact and which had an early stage connection with University Incubator/ Co-Working Space or University-affiliated Incubator will be given suitable recognition/citation/awards for their achievements.
- 1.15 GTU will create a collaborative online platform for linking student start-ups so that they may be able to share their challenges, to link with suitable mentors and to catalyze cross pollination of innovative ideas and to leverage complimentary resources and skill sets.
- 1.16 Students will be permitted to apply for grant of official leave of one year at a time for entrepreneurial initiatives during their study. However, the students need to graduate within a maximum of double the minimum time required for graduation.  
Thus a student will be eligible for award of a 4-year degree only if s/he is able to complete all the requirements of the degree within 8 years since his/ her joining the program of study. This period of eight years will include the leave of entrepreneurship.



- 1.17 GTU will exempt student start-ups, certified with GTU-approved incubators, to avail a maximum of up to 10% attendance grace based on the stage of startups in any semester as these students successfully pursue the start-up based upon various milestones:
- i. Ideation Stage – 2%
  - ii. Team and Company Formation – 3%
  - iii. Working Model for technology based firms – 5%  
Or Business Services for service based firms – 5%

Including this 10% grace, a student will need to have at least 75% of attendance required to be able to appear in the semester-end examination.

*A student can use the above exemption of 10% in a single semester. Or s/he may use it in parts in different semesters. However the exemption of a stage, used in a semester, will not be usable again in other semesters. The above exemptions will be allowed only if the respective department of the respective college certifies that they have functioned for 90 days in a semester, with attendance record for each of the days of working.*





## 2. Co-curricular Roles

- 2.1 Every GTU program will dedicate a few hours of its academic time where students and teachers will pursue certain activities for inculcating and strengthening the spirit of entrepreneurship. The Colleges and the Departments will have a choice of building such activities according to the local environment. But, the impact of every activity/process will be required to be benchmarked by every College and its Departments, semester-wise.
- 2.2 GTU will recommend to all its colleges to at least nurture one student start-up. Each college will thus help at least one of their student start-ups to emerge, to grow and to scale every year through the help of all the resources in its campus.
- 2.3 GTU will ask every College/Institution/Polytechnic affiliated with it to establish a GTU Innovation Club for better interaction with their respective Sankul Committee and the industry leaders, who may be the Co-Chair (Industry) and Directors on the Sankul Committee(s).
- 2.4 GTU's summer and winter programs for student start-ups - like Startup Leadership Programs will be accessible to both – GTU start-ups and other local start-ups for building a close interaction between local entrepreneurs and students, who will be the future business leaders.
- 2.5 GTU will continue to organize and continuously improve its practices in IPR to help young start-ups in IPR-related issues. University will create a network of attorneys that will guide and help potential student patentees along with other private firms and agents.
- 2.6 GTU's Open Source Technology Clubs will make efforts to promote among students, departments and Faculty Members the idea of setting up enterprises based on open source innovations and technologies for niche markets.
- 2.7 GTU will regularly host startup-related national level dialogues, workshops and conferences to benchmark its own progress and help create futuristic policies and action strategies to promote Innovation and student start-ups in affiliated-type Universities.
- 2.8 GTU will celebrate an annual "Entrepreneurship & Start-up Day" in all the institutes affiliated to GTU, jointly with the annual Poster Exhibition for Final Year projects.
- 2.9 Students will be encouraged to work as Interns with budding enterprises and with companies (start-ups) on the Campus of GTU or with the Startups in GTU's C-i-C3s or at Innovation Homes in GTU Colleges. This will not only help start-ups overcome their HR issues, the students of GTU will have an instant access to a pool of enterprising companies to work with.
- 2.10 S4 and C-i-C3s in the twenty five Sankuls will develop their activities as a common "market maker" jointly with student start-ups registered at the University's Incubators or at the Innovation Homes at Colleges. This market making process will include new-age marketing communications and processes.

GTU will provide common facilities for operations such as legal, accounting and basic administration, wherever a demand from a good number of start-ups is there.

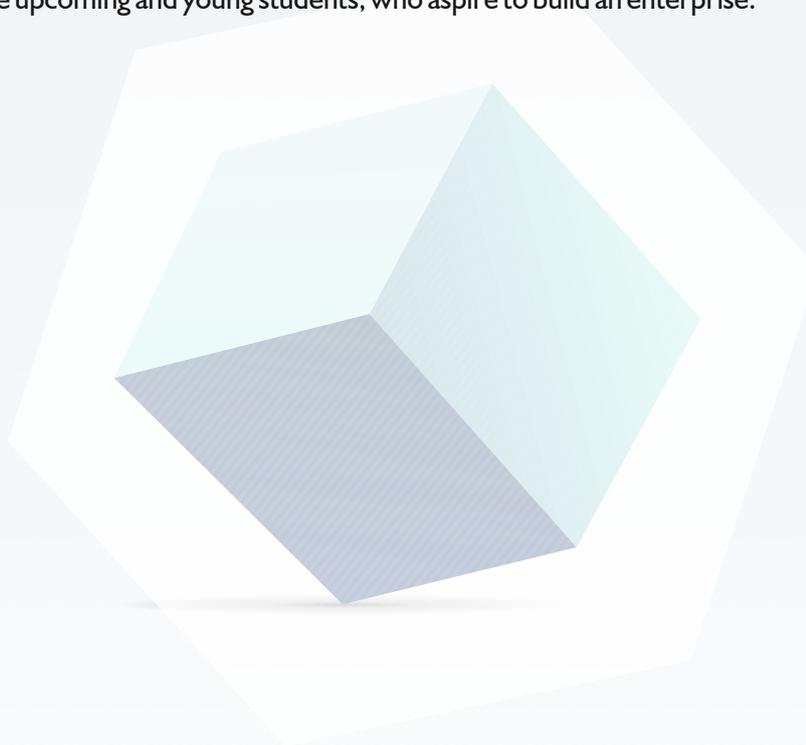
GTU will also attempt to provide basic common minimum tools and facilities that a good number of start-ups, if obtaining them for multiple users turns out to be cheaper and on demand. These may include server space, online tools such as team collaboration, etc.



The University may conduct these processes through a specific section 8A company developed at the University or at the Sankuls, after consulting with Industry Chambers and the Board of Governors of GTU. An appropriate service charge will be taken for making the proposed section 8A company sustainable.

GTU may be prepared to convert any C-i-C3 or any set of 25 C-i-C3s into a Section 8 company or multiple Section 8 companies. C-i-C3s have been designed so that the industry leaders will be leading the management team for every C-i-C3. GTU will welcome a major industry to associate with a C-i-C3. GTU may agree to accept a nominee of the major industry to chair the Board of the C-i-C3. (Normally the Co-Chair (Industry) of the Sankul is the Chairperson of the C-i-C3 of the Sankul.)

- 2.11 GTU will encourage colleges to allocate necessary weightage to have student-start-up-related activities during their annual festivals. GTU will also include such activities as a part of its TechFests and Youth/Cultural Festivals.
- 2.12 Successful startups spinoffs from various campuses will be encouraged to mentor and extend possible support to the upcoming and young students, who aspire to build an enterprise.



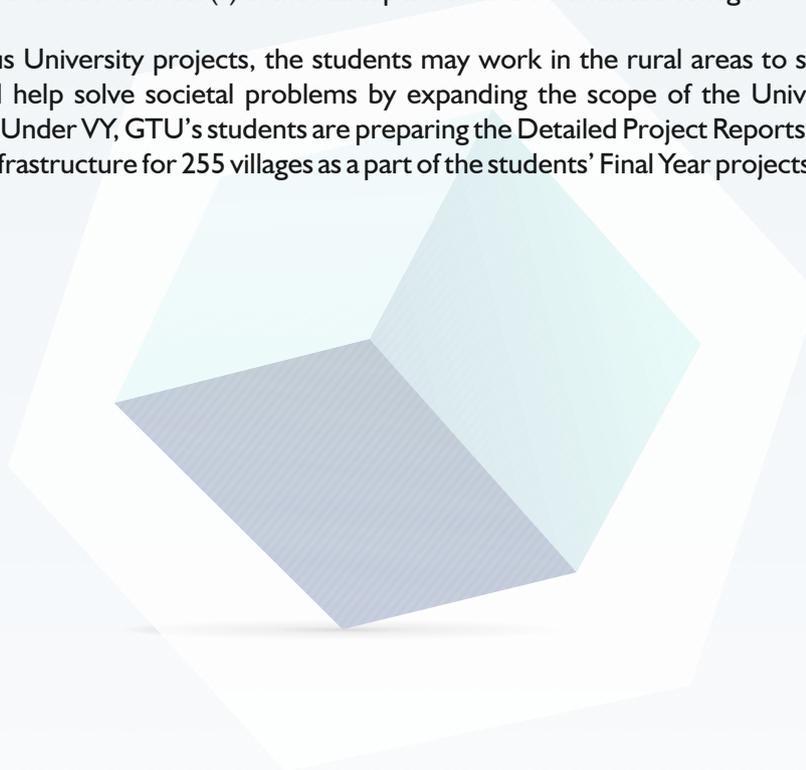


### 3. Efforts with External Stakeholders

- 3.1 This policy also stresses on social entrepreneurship, rural entrepreneurship and attempts to leverage district-level innovation and incubation funds and facilities. GTU students may set up rural enterprises and help potential youth from the rural areas to start up in their locales.
- 3.2 Students helping to set up start-ups for informal sector innovators will be specially appreciated. All the GTU's incubation facilities will support students that set up ventures jointly with the informal sector individuals and communities.
- 3.3 University will explore in setting up incubators in Public-Private Partnership model for setting up and for managing innovation and incubation facilities, with approval from the University Board of Governors.
- 3.4 GTU will reach out to the top five industries and corporations in every sector of Gujarat in order to set up sector-specific incubators through PPP model. The idea will be to establish one industry-specific incubator in one university zone. The proposal from the most suitable industry group will be taken into consideration in such cases.
- 3.5 The Colleges and students will be encouraged to help build the capacity of grass-root entrepreneurial activities like efforts of Self Help Groups, Rural Entrepreneurs etc in their area. The University will ask its MBA colleges to take summer, winter and in-course projects around capacity building of such organizations.
- 3.6 GTU will help setting-up incubators based on traditional knowledge. Thus Pharmacy Colleges may help enterprises in Ayurveda. The MBA Colleges may work with technology start-ups as well as start-ups in handicrafts, fine arts etc. C-i-C3 s will help the concerned innovators (or artists or entrepreneurs) in the local communities and co-host them.
- 3.7 GTU will create a network of fabrication & design facilities, government and private testing facilities, funding networks and others in the value chain.
- 3.8 With request from other state Universities and colleges, GTU will extend cooperation to set up contextual facilities in such Universities for student start-ups based on the best practices arising from the execution of this policy and evaluation.
- 3.9 GTU will partner with suitable agencies including the local state and union governments, NGOs, NGI, private sector corporations, etc. to analyze various inferences through joint research or through research at GTU, under contract from various agencies, in order to derive insights for helping start-ups scale up. GTU will establish linkages with student start-ups and organizations, from within Gujarat or outside, for mutual benefit.
- 3.10 At every Vibrant Gujarat Summit and at any other common events organized in the State, GTU will propose/ help organize a Global/ National Startup Ecosystem Summit.
- 3.11 GTU will create two forums viz. YES 4 and SES 4 (Young Entrepreneurs for S4 and Student Entrepreneurs for S4) to give a platform to all the Young Entrepreneurs and Student Entrepreneurs in the State. Those who register with these forums will be able to avail various facilities like capacity building, networking, etc. As the forums grow in size, the University may start organizing an Annual National Student Startup Festival every year.
- 3.12 Utilizing the GTU Alumni Association (GAA) Centers outside Gujarat, GTU will provide opportunities to start-ups to gain exposure and stakeholder support and to work as a launch-pad in wider markets.



- 3.13 GTU Plexus, the newsletter for showcasing College activities, will highlight colleges engaging in high quality start-up programs.
- 3.14 GTU will call upon the Government of India authorities, which support incubators, to extend at least the same support to the 25 C-i-C3s of GTU.
- 3.15 GTU will call upon the State Government and the local Municipal authorities to make available at least 20,000 square feet of built space at a central location that is easily accessible by the local students, alumni and mentors at major population centers in each Sankul.
- 3.16 GTU will make an effort to see that the apprenticeship program is revisited so that it does not lead to exploitation of the young graduates and provides to them apprenticeship training when the student requires it.
- 3.17 GTU will create channels for cross-institute and cross-university linkages for promoting student startups provided one of the co-founder(s) of the startup is from a GTU affiliated college.
- 3.18 Under various University projects, the students may work in the rural areas to see how technological studies could help solve societal problems by expanding the scope of the University's Vishwakarma Yojana (VY). (Under VY, GTU's students are preparing the Detailed Project Reports for innovative designs of the rural infrastructure for 255 villages as a part of the students' Final Year projects.)





#### 4. Incubation and other similar resources

- 4.1 GTU will explore virtual incubation, mentoring, ideation for product development process to help student startups.
- 4.2 A pool of Mentors, consisting of Incubator Managers, Investors, industry professionals, young entrepreneurs and senior professors dealing with entrepreneurial activities at educational institutions will be regularly invited through GTU's 'CEO in the Classrooms' program to ignite the spark of Entrepreneurship amongst other students.
- 4.3 GTU will set up its own fund or set up a fund with support from multiple stakeholders and create "Prototype Fund" that will help very early-stage startups. GTU will also work with state banks and other financial institutions to set up a student startup angel fund in suitable format. This will support the best spin offs across campuses at university level in hassle free manner.
- 4.4 GTU will create linkages with external angel networks, incubators, TBIs and help link suitable spinoffs to them to help student start-ups wherever in need on a real time basis.
- 4.5 With the support of the Government, GTU will propose a student-contributed fund at University level and discuss with its Board of Governors and Fee Regulatory Committee and others. This fund will be monitored online and projects supported will be shared in the public domain to bring in more accountability and efficiency to support merit-based student innovation and startups. If an alumni should provide funds for seed-funds for student start-ups, as is done for instituting Gold Medals, and if he were to authorize the University to choose the most deserving start-ups, the University will accept the responsibility.
- 4.6 If a Student Start-ups represents the University at a National Startup Fair or any other national activity, considered to be appropriate by the University, may be given travel re-imbursment up to permissible amounts similar to sports and cultural participation. This facility will be valid for up to two co-founders once a semester. For such a facility, the entry/registration for the event should be done with the approval of the University.
- 4.7 168 degree and Diploma Engineering Colleges and 148 other Colleges, that have associated Student Hostels, will be encouraged to build an "Innovation Home" of about 5,000 sq ft on the pattern of Rainbow Mansion in Silicon Valley. Budding entrepreneurs may stay and work on developing a marketable product at a reasonable cost for stay and facilities. The Home would have high-speed Internet, a seminar room and some work spaces. The budding entrepreneurs, staying at the Home would be able to participate in the S4 Extension Center programs on various aspects of setting up a business and will be able to interact with the mentors and young entrepreneurs visiting the Center. They would also be able to use the C-i-C3 facilities of the Sankul and interact with the Co-Chair (Industry) and Directors of the Sankul. Besides, the use of the workshops, laboratories and library of the College may be available to them.
- 4.8 GTU will work with various venture and angel fund groups and governmental institutions to help students obtain seed funding at their early stage of inception when the students are found to have a Minimum Viable Product (MVP). Jointly with other institutions, GTU will try to obtain allocation of funds of about INR 2 lakh each to at least ten deserving startups at each C-i-C3 as a seed fund. GTU will continue to work with Crowd Funding mechanisms to try to obtain the same result.
- 4.9 Preference will be extended to product-based start-ups in comparison with service based startups, while allocating facilities at Co Working Spaces.



### Role of Institutes Affiliated with GTU

1. Every S4 extension center coordinator (other than the TPO) should be given flexibility and s/he would be required to coordinate the entrepreneurial activities and academic courses related to innovation and entrepreneurship.
2. For developing a product, if the students of a College require certain Laboratory or Workshop facilities, the Colleges will provide an easy access to existing lab/ workshop facility/libraries etc to students and in case some facilities are not in the campus, the College will guide the students about where they can avail those.
3. If any student start-up represents the College or the University in a national or international event, the College will facilitate it by providing special internal examination and other similar evaluation processes, if he/ she should miss regular internal examinations due to the schedule of the event. However a prior permission of the Principal would be required from the Principal before the student proceeds to attend the event.
4. Students and Faculty Members will be encouraged to participate in national and state level activities like seminars, conferences/in-house programs of Incubators/Accelerators, boot-camps and other similar programs related to Innovation/Entrepreneurship/IPR/Design through Duty Leave. For student startups affiliated with GTU-certified incubators, duty leave exemption will be considered within the 10% exemption, as specified above. However a prior permission of the Principal would be required from the Principal before the student or the Faculty Member proceeds to attend the event.
5. Every college would need to publish and report to university about their entrepreneurship activities and achievements in every quarter.
6. S4 Extension Center of the college will develop the entrepreneurial capacity of rural youth in the vicinity of the college. Rural entrepreneurs and community may be given access to basic laboratory and workshop facility for fabrication and similar purpose after the class hours.
7. S4 extension center will have outreach program for the school children in higher secondary level through the sensitization workshops at the schools to create entrepreneurial culture among school children.

### References:

- a) Please see the web-request inviting suggestions for the Draft GTU Start-up Policy at:  
[http://www.gtu.ac.in/circulars/14Nov/GTUStartupPolicy\\_Draft.pdf](http://www.gtu.ac.in/circulars/14Nov/GTUStartupPolicy_Draft.pdf)
- b) For earlier roundtables for discussing various aspects of Policy, please see:
  - (i) [http://gtu.ac.in/circulars/14Apr/10042014\\_02.pdf](http://gtu.ac.in/circulars/14Apr/10042014_02.pdf)
  - (ii) <http://www.gtu.ac.in/circulars/14Aug/13082014.pdf>
  - (iii) [http://files.gtu.ac.in/circulars/14Oct/07102014\\_03.pdf](http://files.gtu.ac.in/circulars/14Oct/07102014_03.pdf)
  - (iv) [http://gtu.ac.in/15042014/S4%20debate\\_2\\_friday\\_18th%20April%202014.pdf](http://gtu.ac.in/15042014/S4%20debate_2_friday_18th%20April%202014.pdf)