Detailed Project Report
on
Alumni Mentorship Program

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1. DEFINITIONS

For the purpose of this document:

PoWER: Promotion of Work Experience and Research. It involves all the students doing projects, its management team and faculty involved; all being a part of IIT Kanpur.

Technocracy: Sister of PoWER@IITD. PoWER means PoWER & Technocracy for the purpose of this document.

Alumni Association (AA): The association of alumni of IIT Kanpur

Opportunity: Opportunity to joining projects or putting and getting any project idea promoted.

Real-life Projects: Projects that can have application in real-life conditions.

Skill-building: Processes which include specialization in particular skill (s).

Projects: Projects to be in which students can participate.

Work-Experience: Learning and gaining experience through working on any real-life project or idea through assistance within or outside IITK.

Emerging Areas: Areas of business and technology that have emerged in recent past.

Accessibilities: Freedom to use the state-of-art facilities in the labs and get appropriate assistance from people managing the lab.

DORD: Dean of Research and Development

PoWER Ambassadors: These are willing alumni and personalities who will act as brand ambassadors of PoWER.

SIIC: SIDBI Innovation and Incubation Center, A platform at IIT Kanpur to promote entrepreneurship.

Alumni Mentorship Program: The whole set of activities and engagements being discussed in this document.

Alumni: individuals who have been the student of IIT Kanpur at some point of time.

Start-up: An enterprise owned or initiated by an alumnus or alumnus being a founder member; till 5th year from its date of registration.

Enterprise: An enterprise owned or initiated by an alumnus or alumnus being a founder member; after 5th year from its date of registration.

Members/family of an institute: students, faculty, researchers and alumni are members/family of an institute.

Group: A collection of individuals who have regular contact and frequent interaction, and who agree to work together to achieve a common set of goals.

Competitive Bidding: Transparent method in which bids from competing groups are invited by openly advertising the scope and terms and condition of the proposed contract by which the bids will be evaluated. It aims at achieving the objectives at the best possible methodology by stimulating competition, and by preventing favoritism.

Partner Institute: An institute that agrees to work with PoWER/Technocracy in an arrangement (partnership) where gains and losses, responsibilities, risks and rewards, are shared among the partners.

Member of a group: A person who belongs to a group.

Member of an institute: A person who belongs to the institute by being a student, alumnus, faculty or researcher of that institute. For an outside agency, the agency needs to enter into an agreement with any of the partner institute of its preference.

Non-member of an institute: Person who does not belong to the institute.

Outside agency: An agency/organization which is not any of the partner institutes will be considered as an outside agency.

Crux: The most important or serious part of the problem.

Host institute: A partner institute providing the working infrastructure for a project.

Accreditation: Certification of competence in a specified work, project, subject or areas of expertise , and of the integrity of a group or person awarded by a duly recognized and respected accrediting organization.

IITK Family: Everyone belonging to IITK - the students, faculty, the alumnus etc.

KoMent: A council of mentors that consist of 2 area representatives - an alumnus or an outside expert and a student-expert for each area of specialization in IITK.

ID: PoWER is building an Innovation Database (ID) which will be the technical database of students, faculty, alumni, researchers and external agencies.

Counseling: Support process in which a counselor talks with another person to help him or her solve a personal problem or help improve that person's idea, or perspective.

Agreement: Mutual understanding between two or more legally competent parties about their duties and rights regarding current and future performance.

Stipend: A source of funds that is provided to an individual, which allows the individual to pursue a particular interest.

Internal concession: It is a subjective issue. For Alumni Start-ups, it means demanding less/no stipend for projects they offer.

Project fee: The total costs of a project including consumables, consultancy chargers, payments, stipend etc.

Institute overhead: A minimum amount of money taken by the institute to maintain the basic infrastructure for pursuit of a project.

Solution: A set of methodologies to solve and implement a crux/problem.

Assessment/feasibility analysis: Analysis and evaluation of the proposed project to determine if it is technically feasible, doable with the resources available, cost effective and profitable.

No Objection Certificate: **It** is a type of legal certificate issued by any agency, organization, institute or in certain cases, an individual, that does not object to the covenants of the certificate.

Buffer time: The maximum extra time that can be allowed after the predefined time for a problem/crux/project is over.

Defense: A process in which the group needs to justify its proposition.

Disclosure of a crux: Bringing information about the cruxes in public domain for competitive bidding of solutions.

Case studies: A case study is one of several ways of doing research. It is an intensive study of a single group, process, incident or community.

M-Tech thesis: It is a document that presents the author's research and findings and is submitted in support of candidature for a master's degree.

B-Tech Projects: It is a document that presents the authors research and findings at the undergraduate level.

Course projects: Projects which are related to a particular course

PhD Thesis: It is a document that presents the author's research and findings and is submitted in support of candidature for a doctorate.

Voluntary projects: Projects that are the idea of students ie they have thought of the objective and requirements

Student-driven projects: The projects done by students as principal investigators.

Working Infrastructure: A minimum infrastructure provided by an institute to do a project/solve a crux/problem.

2. PROJECT INTRODUCTION

Alumni of IIT Kanpur have always been numero uno in their respective fields. They have been actively participating in making IIT Kanpur one of the best institutes in the world by sharing their expertise, network and resources. This participation has evolved into multiple dimensions; and is now eager to formally enter into the domain of mentorship to students through a regular program. Alumni Mentorship Program (AMP) is a step towards this, creating multidimensional interactions between current and past students of IIT Kanpur.

2.1 MISSION AND VISION

AMP will be a program jointly driven by students and alumni, having participation from alumni, students, and faculty. It will involve students to work on projects offered by the alumni, counseling and mentorship to students based on their interests and requirements, joint participation of students and alumni in technology creation and application development. It also aims to create future leaders and entrepreneurs by promoting innovative ideas brought by students and helping students to further develop those ideas through the support and participation of alumni. It will be integrated with student work-experience and research body PoWER and will coordinate with Students' Gymkhana.

3. PROGRAMS AND ACTIVITIES

3.1 ALUMNI PROJECT ENGAGEMENTS (APE)

3.1.1 Alumni Start-up Engagements (ASE): Alumni Start-up Engagements (ASE) will be a program through which start-ups by IITK Alumni can engage IITK students in their projects. Any Alumni Start-up will be accepted as a start-up up to period of 5 years from the date of registration of the firm.

3.1.2 Alumni Enterprise Engagements (ASE) Alumni Enterprise Engagements (AEE) will be a program through which Enterprises by IITK Alumni can engage IITK students in their projects. Any Alumni Start-up will be accepted as an established enterprise after 5 years from the date of registration of the participating enterprise.

3.1.3 Policy

3.1.3.1 Participants:
1. Students (PoWER)
2. Alumni Start-up (AS) or Alumni Enterprise (AE)
3. Faculty
4. Other human Resources (if needed)

3.1.3.2 Types of Projects:

3.1.3.2.1 Work-Experience Projects (WEP): AS/AE will be providing the problem statement and the kinds of solutions they want. PoWER will execute them. PoWER will not share any IP even it is generated; however PoWER will have the rights of joint publications with the participating alumnus. PoWER can also use it for further R&D and academic purposes. Here PoWER means IITK and students participating in this program.

3.1.3.2.2 Research Projects (RP): AS/AE will be providing the field of work, expected problem and potential research outputs and required resources. The methodology and approach to problem will be researched and developed by PoWER. IP may be generated in these kinds of projects. PoWER will

not share any IP for all the projects agreed upon before March 31, 2010. However, if there is any necessity of IP sharing depending on the project, it will be based on the norms of the institute. Publications will be jointly owned by PoWER and participating agency. PoWER can use the outcomes for further R&D and academic purposes.

3.1.3.2.3 Student Ideas (SI): for all ideas proposed by students, there will be separate agreements depending upon the type of idea, resources required, market/research applicability etc. PoWER will own the rights of publications jointly with the participating agency.

3.1.3.3 Some policy guidelines:

3.1.3.3.1. There will be separate agreement with every AS/AE.

3.1.3.3.2. For every agreement, there will be a group of persons (faculty advisors from PoWER, IITK and Representatives assigned by the AS/AE) who will act as arbitrator.

3.1.3.3.3. For every agreement for a project, the criteria for charges will be material, infrastructural and human resources involved. All expenditures like travel, testing and miscellaneous will be also included in the charge. For AS, there will be internal concessions in stipend of participating students. No project fee or institute overhead will be demanded from AS/AE.

3.1.3.3.4. Participating students will be provided a certificate by the AA, AS/AE and PoWER together to appreciate the efforts of the student.

3.1.3.3.5. PoWER shares the idea of "*Development of Innovation Ecosystem*" and all policies are framed keeping this spirit in mind. We expect reciprocity from other participants.

3.1.3.3.6. Disclaimers: PoWER hereby informs all the prospective persons (including legal persons) that it is a non-profit organization to assist student's gain technical and business skills and at the same time, solving some of the industrial and national challenges. The fee charged is merely to fund its establishment charges. This is a research work, which like any other research may fail or do not produce the desired results/out-put, hence the sponsors are advised to exercise their due diligence and business prudence. IIT Kanpur, faculty, students, PoWER or any person associated shall not be held liable for any acts or omissions.

3.1.3.4 Methodology and other guidelines:

3.1.3.41. AS/AE and PoWER will communicate and decide working together.

3.1.3.4.2. The problem statement/idea/research problem will be communicated by one party to another. Then it will undergo assessment/feasibility analysis by experts from either party. It is expected to take 7-15 days. It may be extended if required.

3.1.3.4.3. Once assessment of the problem statement/idea/research problem is done and both parties are ready to collaborate, they will sign an agreement. The agreement will have two parts, one will be a form describing the finances of the agreement, and another will be a collaboration declaration by the parties undergoing agreement.

3.1.3.4.4. Before making any agreement, the total cost is calculated, which includes consumables, Student's stipend, Lab fee, consultancy charges to the faculty, etc.; the specific lab identification and discussions with the Faculty in-charge will be facilitated by PoWER.

3.1.3.4.5. If the research requires no or minimal use of Institute's resources, then Institute may grant No Objection Certificate to PoWER which will facilitate the AS/AE to own the Intellectual Property on the basis of recommendation by the Office of Dean Research and Development. If it is not the case, PoWER may enter into the agreement with the outside agency and Agreement may be facilitated and coordinated by PoWER.

3.1.3.4.6.   Institute's permission to student to engage in the project.

3.1.3.4.7.   If the research is initiated on student's idea he/she shall have joint ownership on the IP generated and right on further research and development.

3.1.3.4.8.   However, if the Research involves substantial use of Institute's resources and infrastructure the Institute shall enter into the Agreement and the student would work in the project and the ownership of the Intellectual Property is at the Institute's discretion.

3.1.3.4.9.   All the student's working in the project shall fill a form and undertake a declaration that he shall dedicate required time in the project and his/her stipend may be withdrawn on non-performance.

3.1.3.4.10.   The Institute and the student shall have right to continue and do further research and development in the project that shall be solely owned by the Institute or the student.

3.1.3.4.11.   Student shall be entitled for royalty/license as per the Institute's Intellectual Property Policy.

3.1.3.4.12.   The project shall begin with release of money from the outside agency, which may 40% of the total project costs or total costs of the first work-package of the project (whichever is agreeable).

3.2 CRUX

CRUX is the part of the problem which is the most important part of the idea/process/ algorithm/ device or any endeavor. Solving CRUX solves the problem or makes the difference one wanted to bring. It can be anything; it can be easy or the most difficult part of the whole idea.

Example:

IDEA: ABC is designing a fake-note detecting device. This device detects the authenticity of a note through scanning (and image-processing after it). It requires a good quality image of note being scanned. Scanned image is processed by a computer and if it detects the note be fake, it rejects it.

CRUX of this IDEA: Automatic scanning of each single note from a bundle of notes with appropriate speed and accuracy.

3.2.1 Introduction:

We always want to do something new, interesting and challenging. While doing it, we find a lot of our time is wasted in doing a lot of redundant things or things which are not much challenging or simply say, which are not the **CRUX** of the idea/problem is. So, most of the times, we lose our interest the idea itself. Consequently, the interesting/challenging part of the whole work is undone.

So, we want a completely fresh approach to problem solving in which we will be focusing on the crux only and by this way we will retain our interest, save resources and get time-bound results having real-life applications. PoWER is implementing this approach through 2 innovation challenges: CRUX-1 and CRUX-2.

3.2.2 CRUX-1

CRUX-1 will be an intra-IITK competition.

3.2.2.1 Process

Stage-1: Submission of an idea/process/algorithm/device or any endeavor and its CRUX in this format:

Title:
Idea: Maximum word limit: 150 words
CRUX: Maximum word limit 100 words
Keywords (major skills and techniques applied in defending and solving this CRUX, keywords not more than 10):

Name and contact details of the group members

Stage-2: Defense of the CRUX and propose a possible solution. The CRUX defined by a group may vary according to different approaches to the same idea, so it is always a debatable issue. However, PoWER will ensure fair execution through participation of experts (including alumni also) within and outside IITK. A group can be given a maximum of two opportunities to defend the CRUX and propose its solution depending upon the availability of experts, time and complexity. The solution also needs to be defended. If the group is successful, the group will be awarded.

Results till this stage will be announced in Takneek (intra IITK technical festival) and successful groups will be awarded.

Stage-3: Groups qualifying Stage-2 need to submit a simple proposal summarizing their approach, timeline and resources required to develop the crux. Then the group will be provided basic resources to solve the crux. The buffer time for submitting solution to the crux may not exceed 20% of the total time needed to solve it.

Stage-4: Submission and defense of the solutions.

If the group succeeds, it will be awarded again.

Eventually the group will have will have a **Patent** and possibly **publication** also by the time it solves the CRUX.

3.2.2.2 The intellectual Property generated in this process will be jointly owned by the group and IITK. If any alumnus or an outside agency or individual is involved in this process, then there will be separate agreements: one at the time when alumnus or outside agency agrees to participate and one after the problem is solved, depending upon the contribution of participating agencies.

3.2.2.3 Faculty, Alumni and outside agencies may participate in CRUX-1 by sharing their expertise, but it is the student group, which need to solve the crux on their own.

3.2.2.4 There will be no limit on the number of members in the group and type of crux.
3.2.2.5 Defense of crux: Defense of crux must contain:
3.2.2.5.1. Discussion of different parts of the idea.

3.2.2.5.2. Prove that it is the only crux.
3.2.2.5.3. A potential solution/approach to solve the crux
3.2.2.5.4. Justify that it the potential solution is an efficient way of solving the crux.

3.2.2.6 Defense of solution: Defense of solution must contain:
3.2.2.6.1. The solution provided by the group completely solves the crux. The group may deviate from the solution it has proposed and work with a different approach, but PoWER will not be responsible for additional resources and time required.
3.2.2.6.2. Solution is compatible with the idea.
3.2.2.6.4. There will be bonus marks if the given solution is the best solution.

3.2.2 CRUX-2

CRUX-2 will be a global competition.

3.2.3.1 **Process**

Stage-1: Submission of an idea/process/algorithm/device or any endeavor and its CRUX in this format:

Title:
Idea: Maximum word limit: 150 words
CRUX: Maximum word limit 100 words
Keywords (major skills and techniques applied in defending and solving this CRUX, keywords not more than 10):
Name and contact details of the group members

Stage-2: Primary short listing of cruxes to be called for defense.

Stage-3: Defense of cruxes shortlisted in Stage-2. The CRUX defined by a group may vary according to different approaches to the same idea, so it is always a debatable issue. However, PoWER will ensure fair execution through participation of experts (including alumni also) within and outside IITK. A group can be given a maximum of two opportunities to defend the CRUX and propose its solution depending upon the availability of experts, time and complexity. If the group is successful, the group will be awarded.

Stage-4: Disclosure of all ideas along with cruxes; competitive bidding for solutions. Outside agencies, faculty or alumni can offer cruxes of their own for competitive bidding. These cruxes need not pass through stage 1, 2 and 3. The party offering crux will undergo an agreement with PoWER before floating a crux. It will be a cooperation agreement.

Stage-5: Groups will bid for solution by submitting solutions. The groups need to defend their proposed solutions. Successful groups will be awarded and will qualify for next stage.

Stage-6 Groups qualifying Stage-5 need to submit a project proposal summarizing their approach, timeline and resources required to develop the crux.

The project proposals will be offered to sponsors (DSIR, firms and other funding agencies). If a proposal is accepted by a sponsor, then PoWER will sign an agreement with the sponsor. After that, the groups may be provided basic resources and working infrastructure to solve the crux. The buffer time for submitting solution to the crux may not exceed 20% of the total time needed to solve it.

If no sponsor bids for a project proposal, PoWER will not ensure resource support for it.

Guidelines for facilitating resources and working infrastructure are discussed in 3.2.2.2.

Stage-7: Submission and defense of the solutions.

If the group succeeds, it will be awarded.

Eventually the group will have will have a **Patent** and possibly **publication** also by the time it solves the CRUX.

3.2.3.2 Execution

3.2.3.2.1 Each participating group needs to register for competitive bidding of solutions. The group may have students, alumni, faculty, researchers and outside agencies or individuals. Faculty, researchers and alumnus of an institute will be affiliated to his/her institute of which (s)he is a faculty/researcher/alumnus. Outside agencies or individuals can affiliate itself with any of the partner institutes. Students, alumni, faculty, researchers and outside agencies or individuals will sign a cooperation agreement before they join/form any group.

3.2.3.2.2 PoWER will strive to have localized arrangements of defense, working infrastructure and resources at different institutes like all IITs, NITs etc. for the convenience of participating groups; but PoWER will not ensure facilitating of working infrastructure if at least half of the members of the group do not belong to any of the partner institutes.

3.2.3.2.3 If half or more than half members of the group belong to a partner institute, then the groups will be provided basic resources and working infrastructure to solve the crux at that partner institute. However, PoWER will not ensure working infrastructure for groups having less than half number of members from any of the partner institutes. Even for the groups being provided working infrastructure, PoWER will not ensure that non-members of the institute may get access to the working infrastructure.

3.2.3.2.4 Outside agencies or individuals offering cruxes need to provide basic resources and working infrastructure for solving the crux. PoWER will try to have agreements with the outside agencies or individuals offering cruxes so that localized arrangements can be made in any of the partner institute with a constraint that at least half of the group members belong to that institute. In case, at least half of the members of the group solving crux do not belong to any of the partner institutes, outside agencies or individuals offering cruxes need to provide the working infrastructure.

3.2.3.2.5 For the first 2 years, we will organize CRUX-2 only at PAN-IIT level including IIT Kanpur, IIT Delhi, IIT Bombay, IIT Kharagpur, IIT Madras, IIT Roorkee, IIT Guwahati, IT BHU and ISMU.

3.2.3.2.6 The rules for sharing work and resources at different places will be revised after 2 years. For the first 2 years (till CRUX-2 2009 and CRUX-2 2010) we will follow rules aforementioned.

3.2.3.3. The intellectual Property generated in this process will be jointly owned by:
   - Group proposing and defending crux or outside agencies or individuals offering cruxes (30%)
   - Group successfully bidding for solution and solving it (30%)
   - Sponsor of resources (30%)
   - Host institute providing working infrastructure (5%)
   - PoWER (5%)

PoWER will not take care of the share of intellectual property among members of a group. All the participants of a project will jointly own the Intellectual Property Rights.

3.2.3.4. Any group can participate in CRUX-2 by submitting crux, bidding for solutions, offering cruxes or sponsoring any project proposal.

There will be no limit on the number of members in the group and type of crux.

3.2.3.5 Primary short listing of cruxes to be called for defense

3.2.3.5.1. It will be decided by experts through a fair and transparent process. A group can't challenge the decision of the selection panel in any judicial platform across the world.

3.2.3.5.2. If a crux is not shortlisted, it may be given one more chance for improvement only if required.

3.2.3.6. Defense of crux

3.2.3.7 Disclosure of all ideas along with cruxes. Competitive bidding for solutions

3.2.3.8 Offering of crux by outside agencies, faculty or alumni for competitive bidding of solutions.

3.2.3.9 Submission and defense of solutions in competitive bidding

3.2.3.10 Project Proposal

3.2.3.11 Final submission and defense of solutions

3.2.3.12 Awards and accreditation

3.3 Skill Building: POWER will organize lecture series, workshops and industrial tours for basic skill building of students.

3.4 Real-world Linkage

IIT Kanpur have been active and participative in emerging as a center of rational thinking, activism and innovation through greater roles played by IITK family in society, industries, innovation and higher education system. In this century, it needs to emerge as a Global University; for that we need to engage more and more with real-world challenges. Some areas of interest and importance could be:

3.4.1 Industry-Academia Interaction
3.4.2 Policy Perspectives
3.4.3 Local innovation systems
3.4.4 Appropriate Technology
3.4.5 Synergy between IITs and other colleges

3.5 Innovation and technology management (ITM)

3.5.1. Area Representative (A-Rep): Every technical/managerial area in which IITK specializes or area in which PoWER works will have two Area Representatives who will coordinate works going on in

that area. They will be default member of (KoMent) Council of Mentors. One A-Rep will be a student of IITK and other will be an alumnus. All A-Reps will have autonomy in decision-making. A-Rep will be expected to prepare a half-yearly report in new developments, current and future trends and opportunities in their area and recommend appropriate steps that need to taken to improve research participation of students in that area. They will also participate in assessment of projects related to their area. In case of necessity of immediate action, they will recommend appropriate actions. Alumni are requested to contribute areas of their expertise or interest by becoming A-Rep of their areas.

3.5.2. KoMent (Council of Mentors): Mentors are the backbone of any knowledge-driven program. So, PoWER proposes to create a Council of Mentors. Democratic set-up requires representatives of people; similarly technocratic set-up requires representatives of technology.

3.5.2.1. Members: All A-Reps and mentors of different projects will be formal members of KoMent. All faculty, alumni and student-experts are welcome to participate in KoMent.

3.5.2.2. Works: It will assess all incoming projects, provide technical expertise, identify and make policies for potential areas of business and technology, envision the future technological trends and make the members aware. It will also look into the challenges and problems in mentoring projects. It will also provide training to members to become future technology leaders.

3.5.2.3. President: A president will be elected from among the mentors. He will represent KoMent in the Nucleolus: the administrative body of PoWER. He will assist all mentors in making decisions and his role is much sort of advisory.

3.5.2.4. Vice-President: KoMent will have a Vice-President elected from among members to assist President in his/her activities. (S)He will convene all meetings of KoMent. (S)He will act as President in his/her absence.

3.5.2.5. Meetings: KoMent will meet periodically throughout the year for the disposal of its activities, date decided by common understanding, convened by Vice-President. There will not be any restriction of quorum. However if any area is the topic of discussion then A-Reps and other mentors of that area must be present. Compulsion of presence applies only to student A-Reps. There will be two half-yearly meetings in which it is compulsory for all members to be present. These meetings will finalize half-yearly reports.

3.5.3 Case-studies

3.5.4 Intellectual Property: Major areas of interaction
3.5.4.1 Patents.
3.5.4.2 Design.
3.5.4.3 Copyright.
3.5.4.4 Semiconductor Design & Layouts.

3.5.5 Technology Management: Major areas of interaction
3.5.5.1 Product Identification
3.5.5.2 Technology Status report
3.5.5.3 Technology Cycle
3.5.5.4 Technology standards, accreditation, calibration & Testing.

3.5.5.5 Technology- Competition
3.5.5.6 Legal issues
3.5.5.7 Trade-Secrets
3.6 Technical Counseling and Networking (TCN)

3.6.1 Innovation Database (ID): PoWER is building an Innovation Database (ID) which will be the technical database of students, faculty, alumni, researchers and external agencies.

This database will be useful in networking in following manner:
1. It will let all the members of IITK family to find like-minded people within and outside institute.
2. Profile will be like your technical CV, visible to others.
3. Designing policies thrust area and research investment planning.

Students will find the right mentor among alumni or faculty, faculty will find appropriate student for their projects, Alumni will find an opportunity to share their expertise by mentoring a student or a group of students and outside agencies will have a privilege to interact directly with IITK Family and further find right people to get solutions of their challenges.

3.6.2 Technical Counseling: Students at IITK learn a lot of technical and non-technical skills. But most of the times, selection of skills to be learnt is not focused. So, at the end of their graduation, a large number of them are indecisive about their career. This condition can be improved if students are provided regular counseling 2nd year onwards for UG and 2nd semester onwards for PG students. These counseling sessions will help them to identify the opportunities, challenges and their position.

3.6.2.1 Mapping: Innovation Database will be used to map students with alumni and experts of the same field the student is working/ interested in. Students will then personally interact with alumnus (s)he has been mapped.

3.6.2.2 Thesis/Project Counseling: Most of the M-Tech Thesis, PhD thesis, B-Tech Projects and course projects are seriously done and have potential real-world application, but most of them end up without connecting them to the real world applications. Thesis/project counseling is aimed to help students to develop applications of their endeavor.

Abstracts of M-Tech Thesis, PhD thesis, B-Tech Projects and course projects will be made available in the Innovation Database. Alumni will analyze the abstracts, interact with the corresponding students and help them in improving their thesis/project so that they can get best output. It will be the best day for IITK when every student will be having at least one patent at the time of graduation.

3.7 21CC (21st Century Challenges)

IITians are said to be visionaries in the Indian society who can think ahead of the time. Our alumni have excellent expertise in the real world and are better aware of the challenges in the 21st century. The challenges are too many and need multidimensional approach; at the same time creating future experts as problems are increasing at a greater pace than our capabilities to solve them. We want IITK family to interact on a diverse set of challenges our planet is currently facing. These interactions

may lead to various case studies, novel and interdisciplinary approaches of understanding and solving problems, experimentation and implementation of different ideas which may help to mitigate order to achieve sustainable and inclusive development.

We propose to organize activities where alumni would select the topic of their interest/expertise and would then share their ideas with students. These activities may be workshops, guest lectures, case studies, surveys, planning and policy-design, experimentation etc. Few areas identified by us are:-

3.7.1 Energy security
3.7.2 Air Quality
3.7.3 Urban planning
3.7.4 Healthcare
3.7.5 Water and waste management
3.7.6 Information systems
3.7.7 Lifestyle
3.7.8 Security systems
3.7.9 Food Security
3.7.10 Education
3.7.11 Transportation
3.7.12 Infrastructure

4. Operational Structure

Creating a new organizational structure for Alumni Mentroship Program will take a lot of time and effort. Also, a lot of its programs and activities overlap with existing organizations. So it will be better if it integrated with existing student-organizations like PoWER and Students' Gymkhana. With this spirit, Team PoWER proposes it to be integrated with PoWER as both are having similar objectives and approach. It will also coordinate with Students' Gymkhana. Also, it will save another organizational structure to bring-into existence and students with the required skill-set.

4.1 PoWER is having a representative from Alumni Association in Nucleolus: the administrative body of PoWER.

4.2 PoWER is having an Alumni Interaction Team under Corporate Wing. Current size is 3 people: 1 coordinator and 2 assistant coordinators. This team will be enlarged to:

4.2.1 Coordinator: (S)He will be coordinating the whole Alumni Mentorship program and other alumni interactions.

4.2.2 Assistant Coordinators
4.2.2.1 Assistant Coordinator Alumni Project Engagements
4.2.2.2 Assistant Coordinator CRUX
4.2.2.3 Assistant Coordinator Skill-building and Real-World Linkage
4.2.2.4 Assistant Coordinator Innovation and Technology Management
4.2.2.5 Assistant Coordinator Technical Counseling and Networking
4.2.2.6 Assistant Coordinator 21CC
4.2.2.7 Assistant Coordinator Operation

4.2.3 The team can be reduced or enlarged if required

4.3 Participate

4.3.1 Roles
4.3.1.1.   PoWER Ambassador: Brand Ambassador of PoWER
4.3.1.2.   Creator of engagements for students in some ideas that you want to work upon/implement
4.3.1.3.   Assessment of project ideas brought by students or offered by any external agency.
4.3.1.4.   Support some student ideas technically and monetarily. Joint cracking of cruxes
4.3.1.5.   Mentor policy design, innovation and technology management
4.3.1.6.   Fostering national as well as global network
4.3.1.7.   Technical Counseling, Networking
4.3.1.8.   Preparing your juniors for 21st century challenges

4.3.2 Positive experiences for Alumni
4.3.2.1.   Finding fruitful reasons to come back to institute again and again
4.3.2.2.   Diverse engagements with Alma Mater
4.3.2.3.   Finding potential partners for any venture/collaborative research
4.3.2.4.   Feeling good after pre-equipping young for current and future challenges
4.3.2.5.   Direct relations with students which will drag back to academic years at IITK

4.3.2 Process
4.3.2.1.   Register and create your profile on Innovation Database.
4.3.2.2.   Express your interest to become PoWER Ambassador.
4.3.2.3.   Visit website of PoWER for regular information

4.4 Expectations
4.4.1.   Enthusiast, enduring and responsible participation of students
4.4.2.   Fresh approach to problems
4.4.3.   Application of knowledge learnt in the class as well as intuitive problem solving ability
4.4.4.   Proper balance between academics and research
4.4.5.   Realistic application of findings
4.4.6.   Professional work culture and professional secrecy/confidentiality of shared/created knowledge/information

4.5 Challenges
4.5.1.   Finding time
4.5.2.   Patient nurturing this idea in beginning years without much expectations
4.5.3.   Coping up with the expectations of family, profession, students, faculty, academics, deliverables etc.
4.5.4.   Channelization of resources and especially convincing their current organization

4.6. Added Values: Reenergizing of life especially after getting "Stability" expressed in Indian Family System

5. Financial Supports and Management

5.1. **Sources of finance:** Alumni Mentorship Program will get financial and organizational support from PoWER. However, PoWER will require resources to support all its programs and activities mentioned above. PoWER also expects alumni to support monthly stipend for area representatives and financial assistance for case-studies.

5.1.1.   Project overhead/project fee received from Industrial Projects. No project overhead is demanded for Alumni Project Engagements.
5.1.2.   Sponsorships for CRUX-1 and CRUX-2
5.1.3.   Revenue generation from sharing of IP generated by PoWER.
5.1.4.   Office of Dean, Research and Development
5.1.5.   Donations from Alumni

5.2 Management of finances: All kinds of finances coming to PoWER will be managed by Office of Dean, Research and Development.

6. Some Existing Engagements with alumni
- A B-Tech Project by 3 alumni being developed as a full-fledged project supported the institute.
- Designing a tourist information system for Commonwealth Games 2010 with an IITK start-up Geokno Pvt. Ltd.
- Designing the outer model of two devices with Simplifix Automations, an IITK alumni start-up.
- Designing the outer model of a device with Cenogen Pvt. Ltd. An IITK alumni start-up.
- An autonomous group of students GE3 (Group for Environment and Energy Engineering) is working with an IITK alumnus Virendra Kothari on energy and environmental issues.

6. Future: Alumni Mentorship is not a new concept but implementing it at every new institute is a challenge and IITK is again taking this challenge to set standards that will be followed by other institutes across the country. Integration of Alumni Mentorship program with PoWER will reinforce both programs. Experiments like CRUX, 21CC, Alumni Project Engagements (APR), Innovation and Technology Management (ITM) and Technical Counseling and Networking (TCN) will have long-term implications for IITK as well as other institutes of India. Possibility of joint participation of alumni, students and outside agencies in problem definition and solving it will greatly improve the quality of problems and solutions. Partnering with other institutes will help IITK to spread the idea of innovation, endeavor and sustenance more vigorously.

7. End Notes

Alumni Mentorship Program has been being planned for years and has evolved to this form after going through various improvements. It is still in nascent stage and will require few years to establish in full-fledged form. We should put targets like each graduating student must have at least one patent and each research scholar must have an international patent.

Alumni Association has been an active forum of IITK family and been supportive to many ideas put by the institute as well as students in past. This proposal is being put to the platform of Alumni Association for discussion and improvement. Our esteemed alumni are expected to contribute to this idea so that once again we can set an example for our nation and the world.

Thanks and regards
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