INDIAN INSTITUTE OF TECHNOLOGY, KANPUR

Agenda for the 551 (2021-22/9th) Special meeting of the Senate scheduled to be held on Monday, August 22, 2022 at L-17, LHC, IIT Kanpur

Item No. 1	To consider the final report (Revised Version 2.2) of the PGARC'2020-21.

The Senate may recall that in its 547th meeting held during April 28-29, 2022, many suggestions were made by the Senators on the final report of the PGARC, such as, Exit Option as a standard feature for all PhD programs, reconsideration of restrictions on number of degree extended students under a Supervisor and additional suggestions like, degree extended students (with or without financial support), tuition fees waiver etc.

Prof. Y.N.Mohapatra, Chairperson, PGARC vide email dated July 30, 2022 has now submitted the final report (Revised Version 2.2) of the PGARC'2020-21, placed at **AP-1 to AP-57**, incorporating all the suggestions/modifications as suggested by the Senate.

A summary of the modification in PGARC recommendation in respect to suggestions in 547th Senate meeting is placed at **AP-58 to AP-64**.

The Senate is requested to consider the final report of PGARC'2020-21 placed at **AP-1 to AP-57**.

04/8/2022

K K Tiwari
Secretary Senate

ANNEXURE PAGES

Second PG Academic Review

PGARC 2020-21

Report of the PGARC 2020-21

Revised Version 2.2

(Submitted on March 30, 2022; Revised June 20,2022)

Submitted to the

Academic Senate, IIT Kanpur

June 20, 2022

Indian Institute of Technology Kanpur

Second Post-Graduate Academic Review Committee

PGARC 2020-21

This final report of PGARC (Revised Version 2.2) is being submitted to the Chairman, Academic Senate after considering the feedback on the report submitted on March 30,2022 following the discussions held in the 547th Special meeting of the Senate. The report is accompanied by a separate list of changes to the original recommendations in the report.

Amitabha Bandopadhyay *Nisheeth Srivastava* *Nisant N. Nair* *Parasar Mohanty*

Prashant Bagad *Sameer Khandekar* *Sarani Saha* *Sri Vanamalla V.*

Vineeth Vijayan *Yashownata N. Mohapatra (Chair)*

June 20, 2022

EXECUTIVE SUMMARY

The Second Post-Graduate Academic Review Committee (PGARC 2020-21) was constituted by the Chairman, Academic Senate with a mandate

i) To review the existing postgraduate programmes of the Institute and the associated curricula, and propose revisions, taking into account the requisite inputs from all the constituents of the academic community;
ii) To review the evaluation system and related issues and propose changes, if needed;
iii) To chalk out the plan of implementation for the proposed revisions.
iv) To examine the academic administration and processes and suggest changes that may be warranted.

PGARC held wide-ranging consultations with students and Departments offering PG programmes, and reviewed available academic data to formulate its recommendations. The report discusses academic issues and closely related administrative aspects that directly impact PG programmes. Some of the highlights of our recommendations are listed below:

- No change in the current credit system is suggested.
- **Letter grades with higher bin granularity** in grade points are introduced as A+, A, B+, B, C+, C, D+ with one point difference from A (at 10) to D+ minus (at 5). Grade points associated with D, E, F remain unchanged.
- CPI based academic performance deficiency is relaxed to prevent the problem of structural grade inflation.
- A course with discipline specific modules on '**Introduction to Profession'**, and '**Communication Skills**' are to be designed by the Department as a compulsory course to be taken any time before delivering the Open Seminar.
- A **PG seminar** course with a weekly one hour devoted to seminar is suggested for all PG students.
- Ph.D. students may be allowed to take, with permission of the thesis supervisor, at least one course of their free choice even after Comprehensive Examination to cater to their interest as an '**Additional Elective'**.
- Ph.D. students can in addition take '**Special Topic Course Capsule'** consisting of 12 lectures to benefit from a visiting expert or offered by a faculty member to pick up new ideas or skills relevant to their work anytime during the Programme.
- For Ph.D. students, the policy imperative should be to have '**Open Seminar in 9th Semester'(OS9S)** so that all measures are aligned with this goal. An achievement marker is introduced according to which the first version of '**Thesis Work Plan'**, which will act as a reference document for subsequent modification and progress, is to be submitted to DMC within 4 months of SOTA.
- The Board of Examiners of Master's Thesis can add a quality tag (Outstanding, Excellent or Good) in their report exclusively based on the quality of contributions of the student. Only those tagged Outstanding or Excellent can be considered for any thesis-related awards or a letter of appreciation. The tag is not meant for the transcript.
- Changes in MS(R) programme is suggested to cater to the needs of students and help reduce problems due to the extension of the duration of the Progarmme.
- Contributions to Academic Support Services are to be recognized for each student in a listing (by the Department) at the end of Ph.D. programme.
- A special **website on PG supervision,** which would provide help and expert guidance to both faculty mentors and PG students on a variety of issues beyond the PG rules, will be developed.
- Propose setting up a '**PG Facilitation Centre (PGFC)**' with a mission to provide a platform to PG students and faculty to make the student experience better from admission to completion of the Programme, and to support Departmental outreach activities directed at prospective PG students. Thus, PGFC will act as a common platform to promote interests of PG programmes both within the Institute and outside.
- A special wing/unit to plan strategies for PG placement, including that of Ph.D. students, is proposed.

In addition, we make several recommendations to streamline the functioning of DPGC and to promote excellence in PG programme including that of greater internationalization.

The report lists section-wise numbered '**R**ecommendations', '**S**uggestions', and '**T**opics for Conversation' to enable focused discussion and actionable feedback.

CONTENTS

LIST OF ABBREVIATIONS

APEC	Academic Performance Evaluation Committee
CPI	Cumulative Performance Index
DMC	Doctoral Monitoring Committee
DOAA	Dean of Academic Affairs
EPC	English Proficiency Cell
MoE	Ministry of Education (formerly MHRD)
MS-R, MS(R)	M.S. by Research
PG	Post-Graduate
PGP	Postgraduate Programme
PG-APEC	Post-Graduate Academic Performance Evaluation Committee
PGARC	Post-Graduate Academic Review Committee
PG-SAC	PG Students' Academic Council
PMRF	Prime Minister's Research Fellowship
SOTA	State of the Art Seminar
SPGC	Senate Post-Graduate Committee
SPO	Students Placement Office
SCDMC	Senate Course Development & Monitoring Committee
STCC	Special Topic Course Capsule
TA	Teaching Assistant
TPI	Thesis Progress Indicator
TWP	Thesis Work Plan
UGARC	Undergraduate Academic Review Committee

1. Introduction

The first academic review of the PG Programme was presented to the academic Senate, in December 2012 amid growing emphasis in the Institute on the centrality of the PG programme. The current review is thus the Second PG Academic Review. In this section we bring out the broad contours of the context in which this review has been carried out.

To reiterate the well-known goals of any Post-Graduate Programme (PGP) in practical terms:

- In a doctoral programme the student becomes a member of the knowledge producing community by engaging with a significant problem at the frontier of knowledge at some depth so as to emerge as an independent contributor to the domain with professional and ethical standards of such a community, and eventually acquire expertise to lead a group of innovators in academia, industry or enterprise.

- In a master's programme, the student should receive training in a specialized domain, and experience research on a focused problem so as to be able to either pursue a doctoral degree, or lead / join a team of innovators, entrepreneurs to contribute as a professional member of such a team.

It goes without saying that apart from the virtues of advancing the internal logic of the knowledge domain, the context and significance of the problem that the student deals with must be contemporary and aim to benefit the larger society, and touch the lives of peoples.

The above has been true for as long as PGPs have existed the world over, though such programmes undergo perceptible changes in practice over a decade or so. About two decades ago, a consensus emerged among institutions of higher learning that the doctoral programme should deliberately shift to become 'student-centric' from being 'Institution-centric'. Though this view is by now widely accepted, the degree of penetration of the idea in practice remains varied among stakeholders.

On a perusal of recent international (mainly North America and Europe) studies and surveys on the subject, one discerns emerging trends in emphasis on inclusion of the following strategies in the doctoral programme:

- Professional ethics, and intellectual property rights and responsibilities
- Exposure required for Careers other than in academia
- Professional Identity in a network of experts
- Participation in international collaboration
- Sensitivity to Diversity: cultural and ethnicity.

There is also a move to view a 'student' in a doctoral programme explicitly as an 'Early Year Researcher', such that the training is geared towards careers beyond the degree.

1.1 Broad contours of the Context:

- For the last decade and half the higher education scenario has undergone huge transformations, though the nature of changes has been different within the country and abroad. In the current globalized scenario, it is abundantly clear that the Institute's major emphasis has to be on Research, Ranking and Recognition.

- Since the last review it has been heartening to see many incremental steps that have been taken to improve PG academic administration. However, changes in policies and procedures are often carried out in response to short-term problems, and their effects show up only in the long run. More importantly, the higher education environment is changing faster than our time constants of effecting change.

- The traditional strengths of our PG programme lie in establishing streamlined, 'manual'-driven procedures, and fueling aspirations to produce students of internationally recognized quality and calibre ready for industry and academia. Often the challenge has been to realize these objectives under practical constraints of resources and facilities.

- It is widely believed that one of our persistent weaknesses has been inadequate efforts to project our true strengths to attract the best of available talent. Despite this, fairly good students have been flocking to us over the decades, though it can no longer be assumed just on the basis of being an older established IIT. The trust of the newer batches of students must be earned anew in an increasingly competitive landscape of higher learning. We are faced with a host of newer institutions which offer advantages of location, ability to adopt nimble-footed policy making, and comparatively more modern infra-structure.

- As an Institute we are at an inflection point, and hence in view of the opportunities before us in the form of a resurgent industry, and unprecedented growth in academia, our policies need careful tuning, and honing our best practices conducive to healthy academics and research excellence.

- As compared to many countries in the rest of the world, we have been so far fortunate to have received financial support from the Govt., especially in the form of PG scholarships which has served as the backbone of incentives for PGPs. However, in the new evolving economy, this can no longer be taken for granted both for reasons of deliberate policy and financial constraints. Our policies and actions must reflect this new reality.

- In recent years, young faculty members have brought perceptible dynamism, energy and variety to the evolving content of our PGP. The PG programme is one of the principal instruments of aligning the deep-rooted academic values with their brimming aspirations. A spirit of experimentation needs to be injected into the content of the PG progammes, even if at times they are at odds with the institutionalized academic conservatism.

1.2 The Scope and Methods of the Review

We consciously focus on the Ph.D. , M.Tech and MS by Research Programmes.
(We keep out of purview the new programmes which are at various stages of development and roll-out such as eMasters, DIIT and Programmes of new Departments which have received the Board's sanction.)

One of the principal challenges we faced during the review process is that the academic and non-academic issues came before us in tangled knots, and it was difficult to disentangle them to keep our focus on academic issues. We realize that this is truly a characteristic of PG programmes – most non-academic issues have direct academic consequences. Often, the students simply failed to make the distinction. We make broad comments and suggestions on the clearly identifiable non-academic issues and consider in our recommendations to the extent possible for an academic review committee.

As far as academic issues are concerned, we relied on the data made available to us by the PG and Placement office in a variety of forms. These data seem to be reliable indicators of issues we are grappling with. In some cases, the student representatives volunteered to bring results of surveys conducted by them on focused issues. As for opinions, and perception issues, we realized that the problems with PG programmes are broadly known though the extent may not be apparent to any individual stakeholders. We resisted the temptation though to mount a questionnaire-based survey for two reasons – a) an excellent survey of Ph.D. issues conducted in 2017 was already available to us, and b) we sensed a certain resentment against carrying out such surveys (specifically for 'non-academic' issues) which apparently led to no 'real' consequences. Many of these issues were also reflected in the PG Open House that was conducted by Students' Gymkhana in May, 2019, and suggestions sent to us following that.

We organized a series of meetings with students at different levels in Departments, in separate groups of representatives, and met with DPGC along with their student members, and current office bearers at different levels of PG administration. These meetings provided us with qualitative insight into issues, and a sense of extent though not in quantifiable numbers.

Smaller sub-committees focused on specific issues and brought them to the broader committee for discussion.

In our interaction with Departments and student body, apart from noting distinct features of their programmes, the discussion was structured around the following seven headings and related issues under each topic:

1.	Admission:	Process, Attrition, Catchment Areas, Quality, Competition
2.	Coursework:	Compulsory, Professional Electives, Free Electives, Soft and Half Course.
3.	Evaluation & Grading :	Letter Grade, CPI Criteria, Deficiency parameters, Comprehensive, SOTA, Open and viva.
4.	Thesis (M.Tech., M.S- R, Ph.D.):	Choice of Supervisor, Change of Supervisor, Mentor-Mentee relationship, No. of Years taken to complete.
5.	Career Prospects:	Industrial Placement, Academic.
6.	Grievance redressal:	Professional, Work & Living Conditions.
7.	DPGC Functioning:	Effectiveness of Decision Making, Student Participation, Openness, Instrument of Change and Planning.

We also sought feedback on the following specific five issues:

a) Desirability of increasing granularity in letter grading e.g. (10,9,8,7,6,4,2 and 0)
b) Simplification of handling performance deficiency and programme termination process.
c) Integration of industry-oriented training and projects: methods and mechanisms.
d) Efforts towards interdisciplinarity: need for formal structures, flexibilities, and new programmes, if any.
e) Suggestions towards timely completion of thesis work.

Our recommendations are based on the kind of feedback we received on these issues.

It may be worthwhile noting here, as a summary, that during our discussions on the above issues, a large fraction of the conversation was repeatedly around themes, strictly not academic, but strongly related to it such as i) responsiveness to student problems; ii) the most coveted resource of faculty time; ii) mentor-mentee relationships, and accountability. Among the academic issues the concerns expressed were mostly about i) quality of research ii) ability to attract talent, iii) inordinate dependence and demand on mentors, and iv) attrition of M.Tech. students.

1.3. The Size of the PG Programme :

We quote some representative data (not the most current) on the strength of PGP to give an idea of the numbers involved.

- The current strength of PGP is approximately 40% of the total student population, with Ph.D. students at ~1800 (23% of total student strength), and the number of all Master's students is approximately 1400. The strength is not limited by the sanctioned strength, but by limitations of hostel accommodation, financial resources, and in some disciplines by the availability of the acceptable quality of applications.

- The Academic Senate approves every year the sanctioned strength Department-wise for each Programme which is typically much higher than we can admit. For example, in 2019-20, the sanctioned strength for Ph.D., M.Tech. and M.S. by Research were 701, 908 and 157 respectively.

- The graduating Ph.D. students in the convocation are about 220, which is approximately double of what it used to be a decade ago. As an example of intake, in 2019-20 we admitted 400 new PhD students (279 and 121 in Semester I and II respectively) to add to the existing doctoral student strength of 1542 at that time.

- The number of graduating Master's students (M.Tech./M.Des/MBA/VLFM) over the years is not a monotonic function, but has recently touched the highest number of about 546 in all. In 2019-20, we admitted 686 to add to the existing registrants of 589.

The strength of PGP is bound to increase substantially in the near-term owing to the expected increase in uptake by a sizeable recent addition to the faculty strength, which currently stands at 466. The current Ph.D. strength is approximately four times the faculty strength, which is already a healthy number, and is likely to touch 2000-2200 in the next five years. This formula (4 times the faculty strength) can be a useful indicator of whether the doctoral programme is under-populated or over-populated in different Departments and IDPs.

1.4 **Format of Recommendations**:

It has long been considered that PG Programmes are owned by Departments and Programmes, and the central administrative apparatus only provides a uniform skeletal structure which can support a large variety depending on specifics of a discipline or domain.

Over the years, we have thought it fit to increase the centralized administrative component without jeopardizing full freedom to mount variety in content with independence in academic judgment and parameters of operation suitable for the domain knowledge. We are keenly aware that retaining this independence of disciplines to experiment within the broad parameters set by the Institute is a hallmark of a well-designed PGP. In view of this, the recommendations for change also must admit freedom of academic space for a Department or Programme to operate, and any rule or procedure to fit all sizes and disciplines must be viewed with due care.

In the rest of the Draft Report, we will make three types of recommendations after brief observations regarding an issue or problem (x.x etc. are numbers under that section):

R x.x: Recommendations to Senate for considering adoption;

S y.y: Suggestions for the concerned admin or unit to consider and provide definitive action as found appropriate. The response is expected to vary keeping the specific ground realities or relevance to a Deptt. /Programme/ Committee/administrative unit;

T z.z: Topical Issues on which further conversation within the participants must occur though we may not have a definitive view on it right now.

2. PG Manual: Updating & Maintenance:

The PG manual (the booklet on 'Postgraduate Programmes: Procedures and Requirements'), containing clearly worded clauses approved by the Senate through the due process, has been central to the operation of PGP by all stakeholders. The custodian of the PG manual and its interpretation is the SPGC. The academic features are implemented by the SPGC while the Dean, Academic Affairs is responsible for the implementation of the administrative aspects of procedures stated in the manual. The continuous updating of the rules and procedures of the manual has served us well.

Some stakeholders of PGP have pointed out an inordinate delay in updating the PG manual and the existence of several versions of the same clause in different Departments /websites. We are aware, for example, of an instance where due diligence has been carried out to modify 20 or more Clauses to make them less ambiguous and include new ones, and is ready for Senate approval for more than two years now.

R2.1.a) PGARC recommends that steps be taken to ensure maintenance of an authorized and ambiguity-free version of the manual to be duly updated within 10 days of any change or modification approved by the Senate. Typically, the decision of the Senate is sent to the Senate standing committee on Rules for final wording, validation of expressions, and consistency of style. The recommendation is to avoid any delay between the decision and its incorporation in the manual.

b) The version of the PG manual maintained at the DOAA/SPGC website be declared as the authorized mother version at any time. An HTML version of the manual should be maintained at these websites.

c) A 3-member PG Manual subcommittee of SPGC, aided by technical support from DOAA, be responsible for all aspects of maintenance and updating, and ambiguity-free interpretation of the PG manual at any time. Steps/ events to ensure familiarity of the manual and its provisions (especially among DPGC student representatives) can be taken on the advice of this sub-committee of SPGC.

S2.2. We suggest that a FAQ version of the manual (in HTML) also be maintained on the website especially for new students.

T2.3. There were suggestions that for some programmes such as MS by Research or M.Sc.-Ph.D. dual degree, separate Guidelines & Rule Books be created in student-friendly style with references to the authorized PG manual. While we can understand the usability of such rule books, there is also a danger of propagating unauthorized versions or interpretations. We recommend further discussion of this issue.

The PG manual implicitly incorporates our guiding philosophy of PG education, and principles of academic administration. However, a healthy programme is not determined by rules or procedures alone. Hence, there is a need to make renewed efforts to inject meaning to the processes envisaged by these procedures, without which rules degenerate to rituals. Many of the recommendations in the later sections are incentives for creating an academic ambience around these processes. Without this spirit, more rules and regulations merely lead to elaborate rituals sans original academic intentions.

3. Proposal to set-up PG Facilitation Center (PGFC) :

We introduce this new proposal early in this report since we refer to it in many of our later discussions and recommendations.

A PG student typically coming from another academic set-up often expects a simple extension of her college experience and is left bewildered by the organizational structure and flow of decision making, and the stress of academic rigour. It is specially so if the issue they face is somewhat non-standard. With an increase in the size of our PG programmes, and students with varied backgrounds, this problem seems to have become more acute. An orientation programme at the beginning alone is not enough to remedy this; and the student experience slowly develops through interactions as the programme proceeds.

In spite of having a well-oiled PG administrative machinery from the faculty point of view, there is a perceptible dissatisfaction regarding the student experience taken as a whole of the Departmental procedures, PG back-office operations, and related activities of other administrative units. This discontent has led to the propagation of a *perception* that the system is unresponsive towards problems of PG students. We were surprised by the widespread feeling that the PG programme is very low on the priority list of the Institute, contrary to our public articulations.

It is felt that there is a gaping hole in the student experience we offer to PG students due to lack of easily accessible fora in which to articulate problems, seek professional support in building skills, or collectively work for solutions interacting with faculty members across Departments.

R3.1. a) PGARC recommends setting up a PG Facilitation Centre to serve as a front-end for supportive processes for PG students, and organizing steps to enrich PG student experience, and providing consistent and coordinated support to Departments and Programmes in projecting PG programme to the target population outside. In a way, there has been a significant beginning in setting up a unit within the PG Office for Plagiarism Check and Language support for thesis writing. There is a requirement of more such support units, which rules may not strictly mandate, but would respond to constituents' felt needs and demands. The broad goal would be to find ways and means of improving the student experience in the PG programme.

b) The functions of the PGFC would broadly include

i) arranging professional support required by groups of students in improving

- language skills outside formal course structure
- communication skills in navigating careers
- software and data analysis skills etc.

This is an indicative list that can evolve in consultations with students and faculty. Some of such units can go on to become semi-permanent features within the Centre.

ii) Co-ordinating outreach efforts of Departments to project PG programme in

- digital media space (interviews with faculty and students, short films etc.)
- social media
- uploading Faculty interviews on career advice
- organizing events celebrating student experience through achievements in publishing papers/attending Conferences/ innovative projects, etc.
- providing support to the calendar of outreach activities involving R&D and PG students.

iii) maintaining helpdesks to direct students seeking help manned by experienced students as part of their TA work,

iv) providing support to international PG students in consultation with International Relations Cell.

c) The Centre should be headed by an experienced faculty member or an eminent educationist aided by a team consisting of one designated DPGC member from each Department, and PG representatives of Student's Senate (PG-SAC). A qualified manager (and some support staff) with experience in handling student activities would be responsible for arranging day-to-day activities of the Centre.

Such units are common in facilitating graduate studies in most top universities of international repute. The best ambassadors of our Programmes ought to be our own students, and hence improving the overall student experience through coordinated activities is a high priority.

4. Admissions:

The ability to attract talented students through PG admissions is a measure of success of any PGP. If sufficient care and steps are taken pro-actively, it can begin a virtuous spiral up. Strengthening the profile of IIT Kanpur is the single most factor, and PGFC proposed in the last section can specifically work towards it by coordinating Departmental efforts, and making such efforts consistent with pre-specified targets, and a calendar of activities throughout the year.

4.1 The stated vision for the near term should be to make IIT Kanpur as the first choice for PG admission. The discussion note of the PGARC sub-committee on Admissions is attached in the **Appendix I**. It touches on many aspects of our PGP. Some of the salient suggestions are:

- Competitive advertisement and publicity to be handled professionally by a dedicated team (can be a part of PGFC);
- Attractive Programs for extraordinary students, offering Integrated Ph.D. with M.Sc and M.Tech., personnel from industry, and a larger fraction of foreign students.
- Open House for IITK B.Tech. and BS students
- One-year Master's Programme for personnel from industry.

R4.1. Departments must specify a <u>list of broad areas where vacancies for Ph.D. students exist</u>. The promotional information prior to the advertisement for admission needs a lot more care and thought.

This need be done to the extent that it helps the applicants to our Programmes, and is not to be interpreted as a binding promise.

S4.1 a) A scheme can be initiated to invite a group of high performing students (as per pre-determined criteria) to visit the Department prior to the advertisement process for Ph.D. admissions.

b) Each Department may announce a (online) pre-admission talk for prospective candidates exposing them to possibilities.

S4.2. <u>Attrition in M.Tech. admissions</u> was identified as the single most problem in many Engineering programmes. Though the problem is well known and is linked to external factors, an effort can be

made to proactively provide 'honest' career guidance by a group of faculty members during the relevant time window after offering admission.

T4.3. Centralized admissions to M.Tech. through COAP seem to have been helpful. It is an indicator of our standing among the target population. However, the Institute or Department loses control over how low in the pecking order one can go to fill all seats. The Senate should devise a way of limiting the number of students as per pre-determined quality/performance criteria and not fill up all seats available.

T4.4. If interviews are held as a part of the admission process, the dynamics, and norms of holding such interviews must be discussed and agreed upon. The Department can develop a common set of norms to be used for such purposes. Even for an expert in a discipline, care and forethought is needed to formulate the kind of comments and questions to elicit responses that can be used for academic judgement within a short interview.

5. **Credits and Letter Grades:** *This section has been submitted as a First part of the Report separately.*

5.1. PGARC does not recommend any change in the current Credit system which has by now stabilized since the last change. However, we note that the PG courses have been mostly assigned credits through a simple mechanical translation of earlier units to credits.

S5.1. We suggest that during course review as part of this PGARC, actual course load in terms of the number of hours as per the currently adopted formula be reviewed for each PG course with care. Possibility of introducing a tutorial in some of the PG compulsory courses has been suggested by students.

5.2. Change in Granularity in Grading Scale: The need for a finer grading scale has been felt especially for PG courses since the classes are smaller, the students take typically only 6-8 courses. The ability to make a finer distinction in performances would avoid a sense of grade inflation in most cases (especially in view of minimum CPI criteria for continuing in the PG programme). In our interactions, there was almost unanimity of all stakeholders on this proposal. We would also like to see this scale to be uniformly across all courses in UG and PG programmes in view of increased porosity between these programmes.

R5.2. PGARC recommends that the Grading scale be changed as suggested below in **Clause 7.6.1**:

Letter Grade	Weight	Description
A+	10	Outstanding
A	10	Excellent
B+	09	B Plus
B	08	Good
C+	07	C Plus
C	06	Fair
D+	05	D Plus
D	04	Pass

E	02	Exposure
F	00	Fail
S :	Satisfactory	
X:	Unsatisfactory	
I :	Incomplete	

There are 12 letter grades for a course that can appear on a transcript, with I being for internal usage before converting it to one of the valid letter grades on completion of evaluation components by the stipulated last date for submission of grades in a semester.

All other parts of Clause 7.6 of the PG Manual remain unchanged.

6. Coursework:

- Inadequacy of Courses in small streams within a Department or Programme with sub-critical number of faculty: The demands on coursework for PGP varies within Departments as may be expected, but it was observed that Departments/IDPs are struggling to be able to offer enough courses to the satisfaction of students (especially in Master's Programmes) in small Departments/IDPs, or large Departments with too many streams. Sometimes even compulsory courses are being joggled around in semesters due to a lack of critical number of faculty in the Programme or Stream. This is a serious academic concern and Departments must evolve a strategy to deal with this. In some instances, changes in the declared course structure of the Programme due to these constraints do not get reported in Senate Committees, ostensibly due to a larger degree of freedom in the temporary restructuring of the Programme. This does point to the questions on the viability of such streams and Programmes due to the sub-critical number of faculty, and the need to quantitatively define the critical number required for such streams.

- Need for ownership and design of Interdisciplinary Courses:
  The need for interdisciplinary courses (compulsory or electives IDC /IDE) designed especially for PG students across Departments have been voiced. Taking ownership of such courses, articulating their need across Departments, and bringing several Departments together seemed to need huge efforts bordering on missionary zeal. This points to lack of a structure to easily design and offer such courses. An indicative list of such course is:
  - Professional Writing
  - Instrumental Methods of Analysis (Electronic, Chemical, Biological applications)
  - Mathematics for Science and Engineering
  - Computational and Numerical Methods
  - Nonlinear Dynamics
  - Mathematical Modelling and Simulation

R6.1 a) IDC and IDE courses should be jointly designed and offered by the participating Departments and are made available to willing students across the Institute. SCDMC should review the feedback of these courses and include their observations in its report to the Senate. The Departments should be encouraged (and even incentivized) to formulate IDC/IDE courses, specially converting those which are offered as different

versions for similar contents. All Departments/IDPs should participate in at least one IDC annually.

b) The ownership of these courses must be taken by rotation among the participating Departments, and the arrangement and the roster can be brought to IAC for agreement and approval for a period of 3-5 years.

c) The Department should recognize the academic load of instructors of IDC courses in teaching assignments.

T6.1 d) Do we need a virtual 'Center of Interdisciplinary Studies' which spearheads the design, development and offer of such courses, and work for advancing other interdisciplinary issues? The Center can be host to Scholars in Residence who are not attached to any particular Department.

6.2. Courses on Language and Communication Skills: Acquisition of certain standard of functional English has long been considered as desirable (which has become, in fact, essential) for those completing our PGP.

R6.2. a) All PG students (except those from MBA or VLFM, or any other group approved by Senate) are to be asked to appear in a test designed to assess their level of proficiency of English as a functional language in the first semester. This test must be designed and conducted by an authority approved by the Senate. English Proficiency Cell (EPC) has been given the task in the recent past, and its responsibility on carrying out this can be mandated by DOAA with approval from IAC. The test should be used to find those students who need a remedial course in English, which can be taken either as a) MOOC Course, or any other equivalent course prescribed by the Department, or b) register for a course such as IDC603 with the provision of earning a letter grade or S/X grade.

b) Completion of the above condition (either passing the Test or completing a remedial course successfully) must be considered as partial fulfilment of the PG programme of the student, which can be opted for any time during the programme, and be monitored and recorded in the progress file of the student.

R6.3. All PG students should register for a zero-credit PG Seminar Course (at least for one semester for M.Tech. and two semesters for Ph.D. students) in which they attend seminars given by students by turn under the mentorship of a faculty. The seminar delivered by the student should be 15-30 minutes duration as per specified norms on a topic approved by the instructor/thesis supervisor. The content and style of the seminar can be discussed to improve communication skills. This would also help increasing the breadth of knowledge and awareness of current trends in the discipline.

R6.4. Introduction to Profession & Communication Skills : The Department is advised to offer their doctoral students a course covering topical issues relevant to the profession and the disciplinary community, along with communication skills in writing and oral presentation. The communication skills module may be offered at the Institute level, and the introduction to profession module should be offered by the Department. This should be designed keeping the specific discipline in mind. The possibility of topics that can be included is given in **Appendix II.**

6.5. Additional Electives for Ph.D. students: Often a good Ph.D. student is desirous of taking a course beyond the strict requirements of her degree, especially from another discipline or department.

R6.5. PGARC recommends that a Ph.D. student be allowed to do a course beyond the strict requirements of the degree in terms of credit either with the Option of Letter grade or S/X with the consent of the Supervisor (keeping in view workload, need and progress). These courses should be labelled as Additional Electives (AE).

S6.5. We would encourage Supervisors to allow students in Engg. and Science a course in HSS at an appropriate level as an AE if the candidate wishes so (of course keeping in view constraints of workload and progress). This helps Ph.D. students to get exposed to an area of human interest during their fairly long stay in the Programme. This course may only be allowed after she has become a candidate after passing the Comprehensive Examination successfully. This resonates with the idea that all formal learning may not be seen in terms of instrumental or requirements of training. HSS students can similarly be allowed a course in a field of interest under similar conditionalities.

6.6. We feel modular courses are especially important for the doctoral programme to pick up a new topic of interdisciplinary importance or build quick foundations in a topic that a candidate might not have given attention to in the earlier part of education, but is important to her research. We would like the Departments to consider offering such modular courses which can be taken in the form of (Open Electives) or Additional Electives (AE) as special topic training package.

R6.7. Special Topic Course Capsule (STCC): With the fast-changing pace of knowledge boundaries, the doctoral programme, in which a student spends more than 4 years must have opportunity to continue formal learning even after all course requirements are over. Such opportunities can be made available to interested students through 4-week long 3-credit course capsule consisting of 12 lectures (and two hours of testing or equivalent evaluation) which a visiting professor, or a special invitee, or a faculty member can offer. The course should have S/X grade only and should be announced before the beginning of the semester clearly indicating the dates for the offer of the course. The approval of the temporary course with the number assigned by SPGC (e.g., STC 999 Special Topic: Epidemiological Dynamics of COVID19) should be proposed by the concerned DPGC and approved within a week of its circulation after collecting feedback. The lecture series should not be part of a Workshop/Conference etc. or as a part of activities of another organization. This provision can also be taken advantage of for a remedial capsule for a group of students. Though credits earned would not constitute credits for degree requirements, they should appear in the transcript.

T6.8. To increase academic interactions and network within the faculty, we suggest a possible slight change in the Course Approval Process. In a faculty of our strength, it is always possible to locate two to three faculty members who can serve as an academic sounding-board for any course proposal. We recommend that comments received from the faculty after circulation of the proposal are taken up for a brief review and discussion by the Instructor with two other faculty members, identified by her (preferably at least one from other Departments) on aspects such as

i) whether the course is too ambitious given the timeframe and number of lectures (many external reviewers in some Departments thought that);
ii) possible learning outcomes etc.

before sending it to SPGC for final approval.

R6.9. All PG Courses must be curated online as approved by SPGC in the format (preferably HTML) as approved by SPGC with full details including the list of Textbooks and References. The course

offering history can be linked to the back-office of the Department and SCDMC. It is important to note that many external Institutions and Universities look up details of structures of courses for their reference, and hence such information must be published online with due professional care in style and content. Any course not offered for more than 5 years should be archived along with information on the semesters it was offered and the name of the Instructors.

6.10 Best Practices & Distortions in the Conduct of PG Courses: There occur several types of deviations from our accepted norms in conducting courses. Being alert to such deviations and issuing an advisory to that effect should be a standard practice in the Departments/IDPs. Two such examples with discomforting frequency were noticed.

- Apparently in some compulsory PG course implementations, it is pitched at a basic UG level, probably treated by the Instructor as a remedial course. Strengthening fundamentals and basics are very desirable especially for students with gaps in their earlier undergraduate training, but it should be done within the proposed course structure without dumbing down the intended purpose of the course. This may be a problem of the perception of students as well. In any case, we think it fit to bring it to the notice of Departments and SCDMC. PGP has strict norms for allowing PG students to take UG level courses (e.g., stipulation of one UG course during the duration of the programme).

- Uneven pace of lectures or engaging many lectures within a short time window towards the end of the semester was another type of deviation from the norm that was reported with some noteworthy frequency.

  Such distortions do occur from time to time but there should be effective mechanisms (HoD, DOGC, SCDMC) to be alert and take steps to reiterate best practices.

6.11. Summary on Course Structure in Curriculum:

In the light of the above, the recommendations and suggestions of this section for curricular structure can be summarized as :

- No changes in credit band requirements for both Ph.D. and M.Tech. programmes are envisaged. However, Departments are advised to bring down the number of discipline-specific compulsory courses as much as possible and increase the elective component. Departments with lower course load should include AE/OE in their structure.
- Departments/IDPs should review all PG courses specifically from the point of view of content and load calculations taking into account self-study or any other requirements as per the current credit calculation regime.
  (Note Credit calculation method currently is C=L+T+P+SS, where SS=2L+T+A, and C: number of credits, L : no. of lecture hours, T: no. of tutorial hours, P : no. of Laboratory hours, and SS is the number of self-study hours needed for assignment and projects.)
- Any course which has distinct or disjoint portions (often combined to fit one course format) should be broken into coherent course modules.
- Suggest weeding out courses with high UG content, or replacing it with a PG level course which provides context and opportunities for emphasis on fundamentals.

b) Recommendations for the Ph.D. Programme:

- Introduce PG Seminar course, if it is not already there with 0 credits and 1 hour per week for seminar presentations by students. A student must take it at least for two semesters.
- Partial fulfillment requirement of Proficiency in English is to be satisfied using one of the available routes following a diagnostic test on English as a functional language.
- During the duration of the Ph.D. programme, a student must take one course (or two modular courses) towards 'Introduction to Profession and Communication Skills'.
- Students may be provided with opportunities (or planned as per requirement) for crediting 'Special Topic Course Capsules consisting of 12 lectures and 2 hours of examination.
- A willing student can be allowed to take, with the permission of Thesis Supervisor, a course outside the professional courses (e.g. typically HSS/ECO/Management).
- Disciplines such as HSS/ECO/IME can incorporate a focused (clearly identified scope) project-based course.

c) Recommended for Master's Programmes:

- PG Seminar Course (for 3 semesters)
- A route to partial fulfilment of Proficiency English must be specified
- Suggest linked basket of courses in streams within the Deptt. instead of inflexible and strict Course Structure Templates.

7. Monitoring Academic Performance: Inadequacy & Programme Termination Procedures:

- The purely CPI based criteria for identifying performance deficiency and termination has in a large measure resulted in structural 'grade inflation' across the PG Programmes, instead of ensuring minimum quality standards in supposedly elite Programmes.

T7.1. The case for removing CPI criteria, or limiting it to a subset of courses (e.g., minimum B in all compulsory courses) was debated within the PGARC but there was no consensus. It requires broader consultations among Departments/IDPs. In the doctoral programme, eventual terminations are insignificantly small as observed in the data over recent years (typical dataset for a year 3 out of 68 initially identified in APEC report).

R7.2. a) The PG-APEC report be presented to the Senate, and approval sought through e-meeting of the Senate at the end of each semester as a standard practice.

b) The current minimum CPI criteria should be reduced to 6.5 in for Ph.D. Programme, and 6.0 for Masters Programmes.

c) The list of deficient students facing Termination from Programme can be allowed to reply to a show-cause notice from the Convener, DPGC after authorization from SPGC on the basis of APEC report. SPGC be authorized to decide on a case-by-case basis considering the written and clearly argued recommendations of DPGC and Counselling Service. Only the Termination cases at that stage be brought to the Senate for consideration of mercy appeals.

In the light of feedback from Departments, we reconsidered the above recommendation for possible modification. However, we recommend that this is adopted in view of the following considerations.

- PG programs are supposed to be 'elite' programs in contrast to UG programs which lead to a 'basic' or 'first' degree. Therefore, merely acquiring credits is not enough for these programs. The CPI criteria is a must.
- However, the present mandatory CPI threshold has led to distortion in grading (e.g., systemic grade inflation to avoid CPI based termination). As a result, the meaning and value attached to grades for PG and UG students have become different. We seem to have adjusted our norms for PG grades, especially A and B, to accommodate a larger spread in competencies. It is true that increasing granularity will alleviate the problem somewhat. However, to make real and substantial difference we need to resort to recalibration of the CPI criteria as well.
- There is a section of students, who in their search for some Bs, look for 'easy' courses and pliant graders to achieve the target CPI. This leads to a wastage of time in doing such non-essential courses to satisfy the CPI criteria.
- Honest assessment of performance and potential is a higher practical ideal than specifying numerical standards for display. The revision of minimum CPI criteria should not be seen as downgrading of standards but rather recalibration to protect the meaning of standards we seek to adopt.

8. Ph.D. Thesis:

- Doctoral work is central to any PG programme, since it constitutes one of the prime determinants of careers of students and faculty, and the Institute's standing and recognition as an institution of higher learning. The primacy that we do and must accord to the work of Ph.D. students towards their thesis is somehow not apparent to all stakeholders when viewed by them through the prism of policy priorities, as our interactions revealed.

- From a systemic point of view, the average time taken to complete, and quality of thesis are linked since the former is a fair first-line indicator of the over-all health of the doctoral programme assuming a certain standard of output that we stick to.

- The reasons for inordinate delay in completing the Ph.D. programme in some cases, and hurdles to achieve quality work, however, can be a complex set of entangled factors, starting from the admission process to issues with access to facilities, funds, equipment purchase and repair procedures. Instead of going into those details, our recommendations would dwell on making the existing academic processes taut so that we are better equipped to handle many of those factors and create a culture conducive to excellence in research.

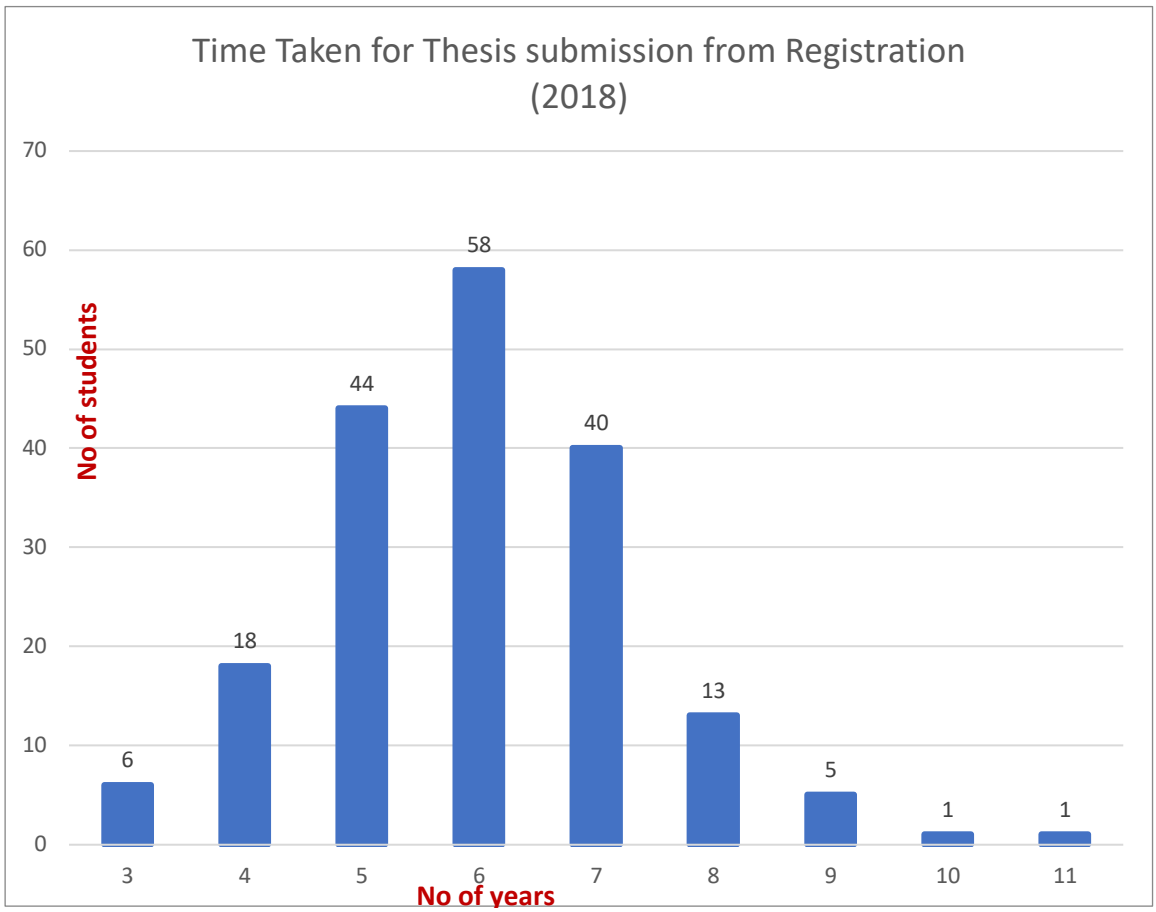
- PGARC makes the following set of recommendations to improve the quality of the thesis and reduce the time taken to complete the degree. The recommendations and suggestions have two objectives:

    - Injecting academic meaning into processes associated with mandated procedures which have in many cases been reduced to 'rituals'.
    - Provide guidance to orient administrative policies and academic decision making at all levels.

8.1. Milestones in Thesis work : Our Ph.D. programme is structured into several parts with well-defined milestones and performance markers. A normal student reaching each milestone at the

specified time-marker is usually able to submit the thesis in time. Any deviation from any of the markers must be viewed seriously with clearly traceable justifications. A certain unjustified liberal view in such matters harms the whole system.

- The statistics of duration between submission and defence is now tracked closely by the PG-office, and certain recent measures have helped in reducing it in many cases. We analyzed the data for some recent years. The data corresponding to 2018 is typical.
- The time taken for thesis completion submission from the date of registration, and the duration between and submission and oral examination for the year 2018, as a typical case is given below.



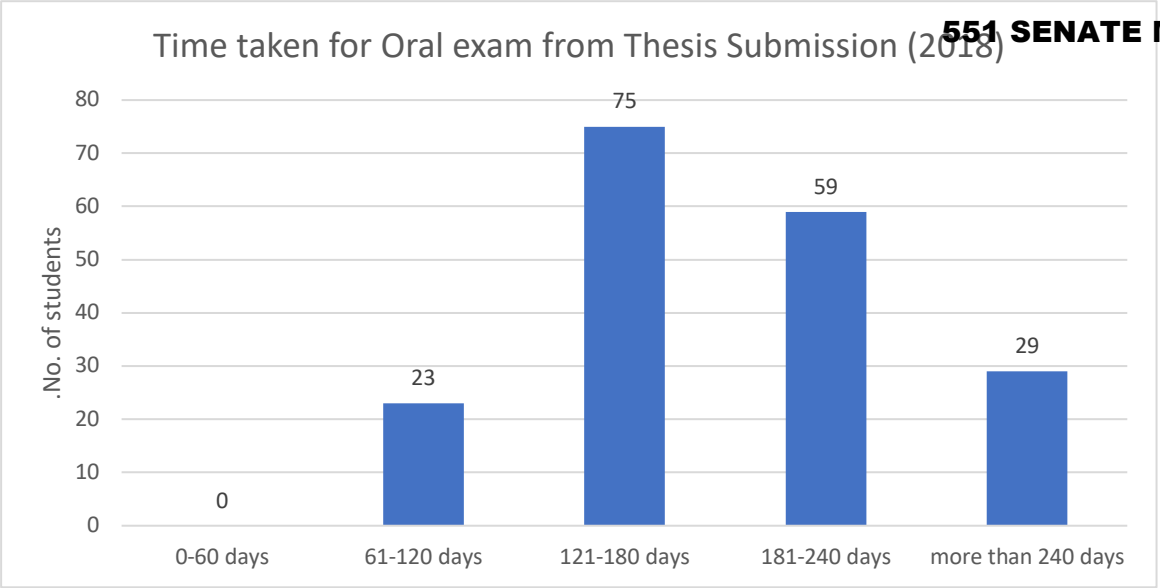


Figure 7.1: *Time taken to complete and time taken for oral exam after submission for Ph.D. students graduating in 2018.*

R8.1. a) In today's time and pace, the only acceptable duration in a respectable Ph.D. Progamme should be that *all regular Ph.D. students are able to present their 'Open Seminar in 9th Semester' (**OS9S**). This dictum or 'mantra' should dictate all administrative policies, decision making and academic judgement at all levels*. A campaign to this effect must be mounted in all circles so as to make it the new normal within the next 4 years. The package of measures taken can refer explicitly to the 'OS8S' policy directive. We believe this would inject much needed urgency, and intensity to the Ph.D. Programme, and would in the long run improve the quality as well.

There are Departments, in which currently the allotment of thesis supervisor is carried out after the Comprehensive Examination, or the coursework is longer than three semesters. These Departments/IDPs need to critically review their doctoral programmes in the meantime so as to align with the policy of 'OS9S'.

b) SPGC should consider and analyze as a separate agenda item once a year to discuss the statistical data on time taken to complete Ph.D. thesis, and time to reach various intermediate milestones. The data should be analyzed Deptt./Programme-wise, and the summary of such analysis be brought to the notice of the Senate along with any insight on underlying factors.

8.2 **Doctoral Monitoring Committee (DMC) :** The Doctoral Monitoring Committee is now a mandated feature by the Senate. Most Departments have implanted it as suggested. By all accounts it has proved to be useful. This should now be incorporated in the PG manual through the usual procedures of the Rules Committee of the Senate.

- Departments with a large number of Ph.D. students find it difficult to hold a large number of physical meetings, and apparently restrict such meetings for special cases. Taking steps to implement it for all students after delivering SOTA should become the norm.
- As far as possible a faculty member from another Department should be included in DMC.

R8.3. a) PGARC recommends that the DMC review meeting for a student need not be held at the end of the semester, but at any time during it with a constant gap between them in subsequent semesters. This would evenly distribute DMC meetings in a Department throughout the semester.

The award of grades of thesis work remains the responsibility of the Thesis Supervisor as per extant PG rules.

b) The members of DMC can be provided with a brief summary (preferably along with a video presentation at a secure internal site) prior to the meeting. This can help reduce the time spent on each student. The student also learns to make video abstracts and presentations which are becoming standard worldwide.

S8.3 Identifying proactively a '*Circle of Peer Groups'* within the Institute: No matter how specialized or esoteric is the thesis problem, it is always possible to find other faculty members and groups who work in related or contiguous fields, or are interested in the wider context of the problem. We suggest that the student and thesis supervisor proactively identify faculty members and their students as a part of 'Circle of Peer Groups' and invite them, possibly accommodating their schedule, to presentations such as SOTA, Open Seminar and other similar events. It is important for the professional community to interact in such events and expose the students to critical thinking and the benefits of varied perspectives through searching questions and perceptive comments. It does demand 'some' faculty time and enthusiasm, but such is the demand for aspirations of achieving a world-class Ph.D. programme.

8.4. Comprehensive Examination: Within the specified PG rules, different Departments have been experimenting with various models and tuning them for their purposes. There was an impression that in Departments which have a pre-qualification written exam, the students are taking the viva also seriously. The viva cannot and must not be replaced by a written examination alone.

For a student, the Comprehensive viva is the first occasion, where she is asked to defend her understanding, and connections with ideas on the spot in person. Qualitatively it is so different from the usual demand of answers to questions in a structured exam that many students are daunted by the very format and free-wheeling nature of the viva.

S8.4a) We suggest that the Thesis supervisor prepares the student for Comprehensive viva through several simulated sessions ('mock') for her to understand the nature of the examination and expectations. It is a significant step in their learning since many of them do not realize the importance of connecting ideas, or simply 'what it means to understand', instead have only learnt to regurgitate uncritically accumulated factoids to be recalled on demand.

b) We suggest that Comprehensive Boards provide a narrower pre-specified domain for preparation in view of the student's coursework and foundations required for later work and career.

8.5. Introducing a New Milestone on '**Thesis Work Plan' (TWP)** : In our interactions, we listened repetitively to the perception that the student was at a loss to understand what is expected or did not have a definitive work-plan (often accompanied by no regular meeting schedule). The nature of thesis work is open-ended, yet the student needs to learn to work with the discipline of a scientific project with regular updates, feedback and course-correction. A creative thesis work is an exploration, and can have its moments of feeling 'lost' (sometimes seen as essential for discovery), and yet there ought to be a rough map or blueprint to rely on even in those moments.

R8.5. PGARC recommends that the student presents Version-1 of her broad workplan as a short document specifying the '**Thesis Work Plan'** (TWP) to the DMC within four months of finishing SOTA. The nature and style of the TWP is to be decided jointly by the Thesis supervisor and the student. This would then become the reference document for anticipating hurdles, measuring progress, tracking changes in different versions of the TWP, and course corrections being carried out as the work progresses.

8.6. Monitoring Progress from SOTA to Open: The duration from SOTA to OPEN is the longest period which does not require achieving any milestones mandated by the PG manual. The number of credits completed towards Thesis work through S/X grades for thesis units is a necessary index (especially for the transcript), but has failed as an indicator of progress which would have some shared meaning for students, faculty and the admin. Keeping in view the work packages within the thesis work-plan (TWP), the period can be roughly divided into four achievement milestones (which can be changed as one progresses) which when completed will allow the student to deliver her Open Seminar.

T8.6. Introducing a **'Thesis Progress Indicator' (TPI**): For internal purposes of directing and monitoring progress, willing DMCs or Departments, on a trial basis, can adopt a 10-point progress scale between SOTA and OPEN, i.e. completion of SOTA would earn a student a TPI of 02, and TPI of 10 would mean OPEN Seminar has been delivered. The Thesis Supervisor in consultation with DMC awards 02 points for each intermediate milestone achieved starting with delivering of SOTA seminar. What these milestones are would be mutually developed by the student and the Thesis Supervisor and presented to DMC. The milestones can be broadly specified depending on the norms of the Department, standards in a discipline or style of mentoring.

Examples of Intermediate Achievement Milestones:

i) In a Department where three standard journal papers are the norm, the acceptance of the first and second papers for publication in a standard journal, and submission of the third could be the milestones earning the student 06 additional points in-between. (This will not work if it is expected that due to the nature of the problem, all 3 papers will work out towards the end of the Thesis – a not so welcome mentoring strategy though.)

ii) It could be based on a fraction of specified work-packages completed.

iii) In some cases, the supervisor and student may simply decide to go by the work completed in a semester, by which a regular student would be able to deliver her Open Seminar in the 8th semester as desired.

iv) A good Conference Paper or a recognition may lead to the award of a point.

v) Developing or Mastering certain Tools or a Too Box of ideas.

The TPI at any point is an indicator of how far the student is from delivering her Open Seminar as per the progress in the work towards Thesis, and is part of her Progress dashboard during that period.

8.7. A shared Digital Workspace for Thesis Supervisor & the Student: It is fast becoming an international standard to log all discussions, meetings, document exchange, references- all at one place in a digital workspace shared by the mentor and the mentee as collaborators. This is now a standard norm in teamwork and our students and faculty must benefit from these new developments of working style and digital tools.

S8.7. We suggest that all Thesis Supervisors and Ph.D. students share powerful digital workplaces such as 'NOTION', which is proving to be helpful for most professionals, and 'MIRO' for creative or visual design projects. Almost all other packages including 'MIRO' can be embedded within 'NOTION'. The Institute can acquire group license for 'NOTION" or such equivalent software.

8.8. Online Student Status Dashboard: Currently the PG office is carrying out digitization of all students' files. As a part of this process, a user-friendly status dashboard would be helpful.

R8.8. a) PGRARC recommends that an online '**Ph.D. Student Status Dashboard'** be maintained for each student. This should contain essential information about PG manual mandated milestones, due dates, completed dates, and achievements in Tabular form. The dashboard should be accessible to both the student and Thesis Supervisor at all times. The dashboard should be dynamically

updated both by the PG Office and the student by providing input approved by the Thesis Supervisor. It should contain in Tabular form information on Papers/patents with their dates of submission and acceptance, Conferences attended apart from usual information on SOTA, Open Seminar and Submission.

b) After submission, the dashboard should include the status as the log of entries of back-office processing events such as requests and reminders sent, acceptance or reports received just as it is now usual for journal papers at their websites.

8.9. Ph.D. Students not receiving any Financial Support:

A student typically starts her PhD journey at the age of 23 or 24. After five years, when financial support in the form of fellowship from the funding agencies, DoE/CSIR/DBT/ICMR etc., is stopped by law, the student is 27 years old. At that age, the student again becomes dependent on her parents for day-to-day sustenance and also for payment of the tuition fees. The situation is worse for those students who have dependent parents and/or a family of their own.

A student's PhD duration can get extended beyond five years for a variety of reasons, including but not limited to the student's health/family issues, change of the thesis topic for unavoidable reasons, delay in procurement of equipment/consumables/repair etc., time taken to write/edit/revise the thesis manuscript and so on. However, as per the current system, no matter what the cause behind it, the student gets penalised severely. This needs to change.

Engaging in PhD work without a source of sustenance, among other things, severely affects the mental health of a student, which compromises their likelihood of succeeding in doctoral research. Also, a doctoral programme is often judged not by its successes or by its large number of regular students, but by the minority whose work gets delayed for one reason or another and is without any financial support. A survey of popular social media platforms will reveal that educational institutions are severely criticised for this one reason by their own students. This in turn is already severely affecting the perception of IIT Kanpur as an employer.

In the 2019 data, the percentage of PhD students receiving no financial support from any source stood at 9.65% (175 students)—a number too high for any PG programme under Indian conditions. For a particular department, it is as high as 18% and 40% for a relatively small programme. Only 10 students (0.55%) were receiving funds from sponsored projects. The number of students without financial support must be immediately brought down to less than 5%, and to less than 1% within the next five years.

- The objective of the recommendations in clause R8.9 is to (i) minimize the number of students without any form of adequate financial support; (ii) minimize the financial burden on the students and (ii) to instil a sense of community involvement in solving the problem of our students.

R8.9. Any faculty member who has more than one MoE-funded PhD students who are not receiving financial support from the Institute or the PI and have not yet delivered their open seminar, should not be allowed to take a new student funded by MoE.

This restriction excludes from consideration students reinstated by the Senate following termination as well as special cases identified by DPGC on a case-by-case basis.

8.10. Assignment of Thesis Supervisor: Most Departments have developed their own model of assignment of thesis Supervisor. It needs fine tuning listening to the feedback from the students from time to time.

As already suggested in R4.1(a) the Departments/IDPs should declare on their website the number of vacancies available for Ph.D. students under broad areas of research / stream /sub-discipline when the admission advertisement is made public.

As also suggested in R4.1(b) coordinated tour of the research groups be arranged after new Ph.D. students join and they be given sufficient time before opting for Thesis Supervisor.

S8.10a) The process of assignment is made transparent and is achieved through consultations akin to counselling as is the norm in the liberal academic culture of the Institute. (Some Departments force the students to go to each faculty member and get a signature. Some of these meetings with faculty have proved to be counterproductive and should be avoided as long as the student has discussed with all those who she includes in the list of options.)

b) The process of change of Thesis Supervisor needs academic sensitivity and balance, and hence DPGC and DMC should play a vital role in taking an appropriate decision without undue delay (typically to be resolved within two weeks of receiving a written request).

T8.11 e) There was a discussion within PGARC on whether efforts associated with Thesis supervision be counted towards the academic load. There was no consensus on the matter, and the arguments for and against are listed below for further conversation:

Possible arguments for such a computation at the Department level comes from

- The need to calculate the total academic load on a faculty member.
- Can help Deptt. to decide the maximum, minimum, and average number of students assigned to faculty members.
- Can signify the number of hours on an average in a week/month/semester the supervisor must be devoting to Ph.D. students.

However, the arguments against it are:

- Any quantification is point-less and can be counter-productive.
- Supervising modes differ depending on the discipline and mentoring style of individual supervisor.

8.12. Ph.D. Exit Option : In the 547th (2021-22/5th) Senate meeting, it was proposed that the PGARC committee should look into the possibility of introducing exit options for all PhD programs.

The current Senate approved criteria for exit from the PhD program is only meant for the PhD in Engineering, and is reproduced below for easy reference:

Clause 7.8 of the PG Manual says:

"7.8.1 If a Ph.D. student in an engineering department does not hold a master's degree in engineering, he/she may exit from the programme with an M.Tech. degree provided

(i) a request to this effect is made at least six months before the exit but not before the student has completed two-and-half years (excluding the period of sanctioned leave, if any) in the programme;

(ii) the request is approved by the Senate on the recommendations of DPGC and SPGC; and

(iii) the student has completed all the requirements of the M.Tech. degree (including a thesis).

7.8.2 If a Ph.D. student is in an engineering department and holds a master's degree in engineering or if the Ph.D. student is in a non-engineering department, he/she may request with proper justification to exit from the programme with a degree/diploma. The request has to be recommended by the thesis supervisor, DPGC and SPGC and approved by the Senate. The student opting for exit option may be considered for the award of M.Tech. degree or any other form of degree/diploma, depending on the completed course/research work.

7.9. A postgraduate student may withdraw anytime from his/her academic programme, provided he/she makes a written request to this effect, and his/her request is endorsed by DPGC and approved by SPGC. A letter of withdrawal will be issued by the Head of the Department/IDP of the student."

PGARC recommends generalization of these clauses to introduce Exit Option for all Ph.D. programs.

R.8.12. Exit options for PhD.

The current exit options are to be modified as follows for all PhD programmes (including Sciences, Engineering, and Humanities and Social Sciences):

i. MTech/MA/MS/MSR degree is proposed as the exit degree for PhD in all the disciplines.
ii. The candidates should fulfil the MTech/MA/MS/MSR degree requirements.
iii. Departments which are not having an MA/MS/MSR program have to propose an MA/MS/MSR exit-degree program and its requirements.
iv. A PhD student can opt for the exit option at any point of time in his/her PhD tenure after completing the required coursework.
v. MTech/MA/MS/MSR thesis/project guide will be assigned by the DPGC Convener.
vi. A student failing in the comprehensive examination for two consecutive times may, on the recommendation of DPGC, shifted to the exit track of M.Tech./MA/MS/MS-R programme.
vii . All Ph.D. students in the exit track of a Master's Programme be permitted with consent of the DPGC Convener to participate in SPO placements any time after their fourth semester in the Ph.D. programme.

S8.11. It is suggested that for the degree extended students (with or without financial support), tuition fee may be waived if the minimum total credits as per the PG manual is completed.

R8.12. Residency requirements beyond the minimum for PhD students can be waived.

9. Master's Thesis:

- There is a widespread perception that the quality of Masters' thesis in many Departments/IDPs has suffered over the years. The reasons include early placement pressures, sporadic and pulse-mode efforts instead of consistent progress during the period, hurried execution towards the end, and increasingly uncritical evaluation.
- There is a need for stricter control at all stages of the Masters' Thesis work starting from articulating well-defined goals and scope of the projects.

S9.1. a) Prior to the supervisor assignment, projects with title and a brief description of their scope must be floated on the basis of which students provide their options, or in other words the students are assigned to projects floated.

b) A certain fraction of students in each Department be allowed to opt for centrally floated projects by ambitious institute level interdisciplinary research programmes. Such programmes or Centers typically have focused research or developmental packages which can be easily be converted to Masters' thesis with well-defined goals. Joint supervision of such M.Tech. projects by faculty members from two different Departments should be encouraged for such centrally floated projects.

9.2. The quality and performance in the Thesis seem to have no direct impact on the Master's programmes as a whole since both the criteria for choice during admission and job perspective past completion are driven by placement which is to a large extent does not depend on the Thesis component. There seems to be a lack of motivational drivers to excel in Master's Thesis from the students' perspective apart from completing it as a part of partial fulfillment of the degree. However, from the Institute's academic point of view it is a substantial investment of faculty time and other resources of research and development. One of the principal reasons for this conundrum is that the majority of the Master's projects are not linked to or sponsored by the industry.

S9.2.a) The Master's programme would improve if problems undertaken are shown to be directly related to the industry or are part of industrial collaboration. In fact, for most such projects in the near future, the fellowship should or would be required to come from industry, or be linked to the start-up eco-system.

b) To encourage industry related Master's Thesis problems, higher fellowship or industry named sponsored fellowships need be floated. Consistent efforts in this direction are urgently needed.

c) Master's Thesis aiming at a concrete product prototype or the possibility of an early publication would bring much required enthusiasm for innovation into the Programme. The development of an innovative 'product' can be a legitimate aim of a thesis. A well-defined product/prototype development can be considered a valid Master's project.

9.3. Apart from Placement data, there is hardly any measurable parameters to evaluate a Masters' Programme. Lack of such target metric prevents evidence-based policy changes. As a result, the statements about the quality of the Master's Progamme remain episodic and largely susceptible to subjective perception.

R9.3. a) As an experimental measure, the Board of Examiners for Master's should in its report specify a quality tag such as Outstanding, Excellent or Good in the report with a brief justification. If the thesis is adjudged as outstanding or excellent, a separate certificate of appreciation to that effect can be issued by the Department. The judgement should be primarily based on the student's contributions. The quality tag does not get mentioned in the transcript since it is not a Letter Grade based on relative grading within a population.

b) Only the Master theses adjudged as outstanding or excellent can be nominated to the Awards Committee for consideration for any Institute level award presented in Convocation.

9.4. The Departments /IDPs must carefully maintain a list of all concrete output of Master's Theses such as patents and published papers (if the work gets included in them and the student is a co-author) or

equivalent standard communication. The statistics of such data would be a pointer towards the contribution of the Master's Programme to the R&D output of the Institute.

S9.5. The recently introduced feature of awarding an additional Master's degree to those admitted directly to the Ph.D. degree from their Bachelor's Programme has a too wide variation in course and thesis requirements. While flexibility is desirable for Departments to specify these requirements, the current variety seems arbitrary for the same feature in the PG programme. There is a need to rationalize the requirements for the award of the intermediate Master's degree, and PGARC recommends that this task is taken up by SPGC.

S9.6. Programmes leading to B.Tech./M.Tech. dual degree is in the scope of UGARC. We would like to suggest the feature of a cross-department dual degree in which the second PG degree is from a different Department/IDP from the parent Department in which the first degree is earned. This mainly requires the two Departments involved to work closely to develop a joint template. The existing provisions need be extended to make such offerings possible.

9.7 Project Report instead of M. Tech. Thesis as an Exit Option with MS degree:

The current M. Tech. programme is a 24 month time bound programme with Ministry of Education (MoE) scholarship for 22 months for eligible students. The extension of the degree beyond the time limit should be strictly discouraged and be allowed only for specific cases with possible restrictions on residential facilities.

The current 'M. Tech.' degree requires a student to complete a full thesis. This is the regular M. Tech. programme in which a student is admitted to the institute. Accordingly, in principle, an exit degree cannot be named otherwise.

However, if the student is not able to complete the requirements of a full thesis in the stipulated time as per the departmental norms, then the student can be offered an alternate degree, called M. Tech. (Project Report), as an exit option. The degree will have an annotation, distinguishing it option from the regular M. Tech. degree certificate in which the student was originally admitted.

The following procedure of exercising the exit option is suggested:

(i) The modalities of executing the M. Tech. exit Option should be left to the individual departments.

(ii) The final decision of whether a student graduates with regular M. Tech. (with Thesis) or exit option M. Tech (with Project work not amounting to Thesis) should rest with the thesis supervisor to ensure a threshold quality of academic thesis work which is commensurate with the departmental expectations and acceptance of academic standards. This decision can be conveyed to the DPGC by the end of 20 months in the programme.

(iii) The Thesis Examination Board can also recommend the award of M.Tech.(Project Report) degree if it finds that the submitted 'Thesis' document does not fulfil the requisite academic quality requirements and merits to be a 'Project Report'.

(iv) The regular M. Tech degree certificate be referred to as **M. Tech (with Thesis)** and the exit option degree certificate be named as **M. Tech. (with Project Report)**.

(v) Further it is suggested that the transcripts associated with the degree certificate M.Tech. (Project Report) should include the annotation ***M. Tech. degree awarded with the submission of Project Report not amounting to a full Thesis.***

(vi) Delay in completion of M. Tech. program can be effectively controlled with this EXIT option.

9.8. Non-residential M. Tech./MS programme (Industry Experience)

It is noted that even now, as per the PG manual, MT students can visit an industry/research laboratory for an extended time period during their ongoing regular program (typically after completing their required course work) for interacting with industry/research labs, for data generation or usage of any special equipment characterization tool etc. This option is always open and should remain open.

R9.8. In addition, we recommend that the two following degrees can be introduced

(a) M. Tech. (Industry Experience) - with regular full thesis option

(b) M.S. (Industry Experience) - with project report option

Non-residential MT (Industry Experience) entails going out of the campus for two full regular semesters (and in addition, the Summer term after the second semester, if required/decided), wherein the student will essentially complete major academic work towards the thesis while staying in/with the industry/research laboratory. The suggested modalities for these options are as follows:

i. At least one external supervisor (suitable academic qualifications and experience) should be available from the participating industry/research laboratory.

ii. Since individual industries will have different working terms and conditions (as regards IP sharing, Sponsorship, lodging boarding arrangements etc.), individual faculty members, Office of Dean R&D in association with Office of DOAA, Institute level functionaries should facilitate relevant MoUs with industries to facilitate such a IITK Industry-Academia MTech (Industry Experience) program.

iii. Individual departments should also make attempts to contact interested industries who are willing to accept our students and have meaningful academic outcomes, beneficial for all stakeholders.

Going out of the campus for this program should only be permitted if all regular required coursework towards the M. Tech. degree is complete.

10. M.S. by Research (MS-R):

Background

- This is a young programme, and our review shows that it is in need of course correction already. It was mainly aimed at students with a research 'bent of mind', who are typically sponsored either by an organization or a PI of a sponsored project. The programme is designed with reduced coursework as compared to a normal M.Tech. with more emphasis on a thesis that goes out for review. It was expected that the fellowship for the whole

duration would come from sponsors and PI of projects. The admission is through interview/written examination. It also kept its doors open for those who passed GATE and join the programme with the usual Institute Assistance for 22 months. Thus, the programme has now three kinds of students:

  - Sponsored by an External Organization (GATE not required)
  - Sponsored by PI of a Project within the Institute (with or without GATE)
  - Students with GATE

- The Programme appears to be designed with Institutional needs in mind, and Departments offering it find it useful. It needs to acquire more 'student-centric' features. It is offered by Engineering Departments among which CgS is the only Department which does not offer the traditional M.Tech. track.

- Since its launch in 2017, 133 students have either graduated or submitted MS(R) thesis, and 16 have converted their programme to Ph.D. The current registration stands at 212, and the current financial support status is shown in Table 9.1 below

Table 9.1 : Current registration of MS(R) students and status of their financial support

Deptt.	ASST.	External	Project	Part Time	Self	Sponsored	Grand Total
AE	12		4	1	3	1	21
CE	1		1	2			4
CGS	20				5		25
CHE	6						6
CSE	26		2		5		33
EE	49	2			23		74
ME	36			1	11		48
PSE					1		1
Grand Total	150	2	7	4	48	1	212

The fraction receiving Instt. Assistance is now the dominant one with little or no difference in terms of admission criteria and placement motivations.

- Though the fellowship is only meant for 22 months, it is clear to all stakeholders that it takes at least 30 months to produce a thesis which can go out for review.
- We have included in the **Appendix IV** the results of a short survey in which 66 students participated, and the discussion paper based on which we make the recommendations in this section.
- From the discussion in the Senate, it emerged that there was considerable interest in making the MS-R program more project-centric, in line with the original intentions of this program. Towards this end, we are happy to revise one of our earlier recommendations to make it more specific, and to offer two new recommendations for the Senate's approval. All three are targeted at providing project PIs more freedom to recruit talented employees with the promise of concurrent academic progression via the MS-R program. We have also revised recommendation 10.2 to make it consistent with the new recommendations made for the program in light of the Senate's suggestions.

R10.1. Currently, only 6% of the students in the MS-R programme are sponsored by projects, a serious anomaly for a program explicitly targeted at project employees. To restore the original objectives

of the programme most of the students in this programme should be sponsored by projects or external organizations. To shift the intake of this program in this direction, we recommend that at least 50% of the seats filled in MS-R admission in each department in a year must be against project funding. This percentage may be revised upwards by the Senate in 3-5 years to 75%.

S10.2**.** a) Non-sponsored GATE students (admitted with GATE and receiving Institute funding) should be treated as MTech students for the purpose of placements, i.e. companies open to MTechs in a Department should be open to MSR students in that Department also.

b) If a Department opts for winter admission (second semester) in addition to first semester admissions, and has winter semester course offerings which require exposure to first semester courses, students admitted in the winter may be permitted to defer admission or course registration to the first semester.

S10.3. a) The programme being new and small often suffers from a lack of attention in various administrative and academic considerations. Though most of the provisions of this programme are included in the PG manual, students do face interpretative problems and lack of guidance. We suggest that there can be a separate FAQ or Guidance Booklet for the Programme.

b) In the Departments offering this programme, one member of DPGC be identified as the coordinator of the programme.

c) For Departments having more than 20 students in the programme, the DPGC can have an invited student member from among the MS(R) students in DPGC.

d) The existing provision of converting to Ph.D. programme can be actively encouraged.

T10.4. a) How does one bring <u>about distinctiveness to MS(R)</u> so that it does not become alternative route to M.Tech. for the same target population?

b) What steps are required so that we can meet the expectations of students better, and make aware the benefits of the programme to employers?

R10.5. We recommend that the 24-month waiting period before project employees can become eligible for joining the MS-R program be removed for project- and externally-funded (but not Institute or self-funded) entrants, such that MS-R degrees can be offered as incentives for joining projects to talented potential employees. The admission process for projects and externally funded MS-R candidates should be similar to that of Walk-in interview for Ph.D. programme.

R10.6. We recommend that the requirement of external review of the MS-R thesis be removed, bringing its evaluation in line with current practice for MTech theses. This will improve the timeliness of thesis completion for such students, as well as avoid IPR conflicts that are very prevalent in more industry-centric research problems typically addressed by project- and externally-funded MS-R theses.

11. Fellowship, Tutorial & Teaching Assistantship:

- Increase Project Funding for PG Fellowship: In the Indian context, the availability of fellowships has been the backbone of incentives for PG programmes. However, continued reliance on it can prove to be a threat to the growth of the PGP as we have experienced periodically. It appears that soon we have to rely on projects to fund our PG students, and steps taken in this direction should be a policy imperative. PG programme and funding from sponsored research would be intricately linked in the near future.
- Differential Fellowship as Incentive: With the introduction of fellowships such as PMRF, differential fellowship as an incentive is a new normal. A much higher amount of fellowship for industry-linked Ph.D. problems either by instituting named fellowships, or through sponsorships should be used to attract industry participation. This is all the more important since the number of students in our doctoral programme from engineering departments is on a steady rise. As we note later, this is one mode of seeking better placements for our graduates.
- Participation in academic support services is an integral part of the PG programme. Though the students are provided with compensation for Tutorial assignments, and Teaching Assistantship for others, we need to view them as a part and parcel of their academic training.

R11.1.a) The instructors, in whose courses Ph.D. students are tutors and teaching assistants, may be advised to discuss how the course is designed illustrating the underlying pedagogical principles either through formal meetings or group discussion among instructors. This should be considered as an essential part of a PG student's academic experience.

b) Certification of Participation in Academic Support Services: The Departments should issue at the end of the doctoral programme a transcript-like (in a format uniform across all Departments) the record of participation as Tutor, Teaching Assistant, or Academic Support (eg. Website, library, help-desk services etc.) listed under three different heads chronologically. The format and procedures for this should be laid down by DOAA and approved by IAC. The Department to which the student belongs should keep records for this purpose, possibly with a quality tag of performance (such as Outstanding, Excellent, Good etc.) for internal usage.

c) Letter of Appreciation from HoD for Outstanding Tutorial or Teaching Assistantship: On the basis of recommendation of a team of instructors, outstanding contributions to tutorial support or teaching assistantship can be recognized by a letter of appreciation from the HoD.

S11.2. Tutorial assignments are now much sought after by Ph.D. students. A transparent method of choosing students for such assignments based on academic judgment must be put in place to remove any perception of arbitrariness. It appears that a much larger number of students would like to benefit from such opportunities – though typically such opportunities are scarce.

12. Mentor-Mentee Relationship:

- The mentor-mentee relationship is an important (but often taken-for-granted) component of a doctoral programme. To quote the obvious from the popular text '*Graduate STEM Education for the 21st Century* (National Academic of Sciences, USA, 2018):

> *"Institutions would provide faculty with training, resources, and the time both to improve their own skills as mentors and to provide for quality mentoring and advising to the graduate students they supervise directly, as well as other students in their departments or from across the institution, as appropriate.*

Training would provide strategies for navigating relationships in which goals and identities (cultural, or demographic differences, career options) may differ between mentor and mentee, and mentoring would center on the goals set jointly by the student and mentors and provide strategies for navigating relationships in which goals may differ between supervisor and student.

Training would consider the various challenges faculty face at different stages of their own careers. For example, early-career faculty who are in the process of establishing themselves in a department with a research group or a laboratory may require a primer on best practices for becoming a mentor or advisor. Long-tenured faculty might benefit from periodic refreshers to explore new skills or techniques in supporting student success.

Institutions would provide opportunities for students to seek and develop multiple mentoring and advising relationships, including those that are interdisciplinary and cross departments.

Institutions would also reward faculty for their accomplishments as mentors and advisors."

(Also see 'Adviser, Teacher, Role Model, Friend': National Academy Press, Washington, D.C. 1997)

We need to provide institutional methods and fora to promote healthy mentor-mentee relationships as is customary in top Universities of the world.

- There is an urgent need to reiterate at various levels the best practices of mentoring, and bring clarity on responsibilities and expectations of mentees. Earlier it was typically paraphrased by the oft-quoted dictum of the Thesis Supervisor being 'Friend, Philosopher & Guide' – various aspects of which now need be spelt out with care and sensitivity. Like parenting, it is difficult to provide a formula, but most mentors are able to strike the right solution (which can be different for different mentees) with ease. However, perceptions from a handful of cases, or an otherwise innocent looking practice, whose moral defence is difficult, can vitiate the atmosphere.

- The mentor-mentee relationship is inherently that of asymmetrical power, and it gets further skewed in the cultural context of India. It appears that at this juncture, we need a much wider and urgent conversation to reiterate principles of good mentoring and take steps to create an atmosphere of trust and ethical discipline.

- In our interactions, we encountered many forms of deviation from norm and distortions in the mentor-mentee relationship – their typologies are common though in all large universities as documented in related studies abroad. Some examples of most frequently encountered are:

    - Handing down faculty tasks such as 'grading' unofficially even when the student is not a TA or associated with the course in any way,
    - Assigning tasks wholly unrelated to training or the project at hand,
    - Perception of being targeted for differences in food preferences, clothing or passing hurtful remarks on intellectual abilities,
    - Feeling pressurized to purchase items for the Laboratory with the promise of reimbursement, which may not materialize.

- There must be ways to flag such occurrences early, and the route to air them. Ways to find resolutions should be made clear to the participants. In general, there must be clearly specified multiple channels (instead of feeling the need to resort to unregulated comments in social media) for voicing opinions without stifling criticism.

R12.1. A website be maintained on all aspects of PG student experience helpful for faculty and students with case studies, scholarly documentation, and references on the issues. There are excellent online materials and well-organized websites in several Universities abroad.

S12.1. As an example, a model can be sites such as https://www.mcgill.ca/gradsupervision/ which has topics arranged for both mentor and mentees systematically, e.g.

Being a Supervisor	Timeline	Q&A	Resources

Under each of these topics, one can find at the next level

- Practical Advice
- Ideas for Reflection
- Research & Evidence

which are further expertly substantiated with case studies as box-items. Similar related pages on all items related to the PG programmes have been created at their site with the help of experts in the field.

We must aim at developing such a site, relevant to our socio-cultural context and consistent with the PG manual, with the help of faculty and students. There are excellent online resources which can be curated. This task can be coordinated by PGFC and white papers on such topics can be taken up for Group Discussion under its auspices.

S12.2 a) Events designed to have open discussion around these issues of mentor-mentee relationships must be held periodically involving both young and experienced faculty members as a part of a larger strategy of mentor development. This must be a regular joint responsibility of DOFA and DOAA.

b) HoDs and DPGC need to promote a culture of openness in airing grievances without the fear of reprisal in terms of academic consequences – a feature which has been a hallmark of our liberal academic ambience.

c) PGFC can provide a joint forum for students and faculty and experts to interact regularly on the issue. Such events are best organized by students under the auspices of PGFC.

13. Placement:

- The placement needs of PG students are different from those of UG students, so are the strategies required in the long run. A thought-provoking discussion paper based on the last three-year data on PG Placement is included in **Appendix V**.
- The number of Ph.D. students in engineering programmes is steadily increasing. The exposure of both students and the Industry to placement opportunities must increase many folds. PGFC in consultation with Departments must arrange events/procedures for such exposure. The widespread perception that Ph.D. students should be competent to find their own placement or post-doctoral opportunities need to change.

R13.1. We recommend that a separate wing/unit for PG placement be formed, which will work in synchronization with SPO, PGFC and the respective Departments. The strategies for PG placement for both academic and industrial sectors need a longer perspective, with consistent and, even indirect strategies of participation of industry in the programme.

R13.2. The Masters Programme, and increasingly the Ph.D. programme, from admission to post-degree opportunities depend crucially on placement statistics. The Departments must meticulously maintain placement or next step after for all graduating students of the PG programmes. The DPGC must present this data to the faculty annually to take note strategies required for promotion of the Department, or steps needed for further action.

T13.3. Currently the content of the PG Programmes, in most cases the choice of problems is based on the internal logic or developments in the discipline. More needs to be done to bring in sensitivity of industrial requirements through direct participation of industry in articulating needs and perspective. Industry participation through industry connect must explore educational perspectives through sponsorship of problems, named fellowships, or provision of PG students working in collaborative projects. PGFC can design programmes in consultation with Departments for such activities.

S13.4. A typical example of an indirect scheme would be to provide exposure to our Ph.D. students on a national platform. The Institute should take the lead in providing a scheme under which students can be invited across the country in a particular group of related disciplines to present their Thesis work after submission. National or international experts from other Institutes be invited to judge them for special awards instituted for the purpose.

The frequency with which high profile Conferences are being organized in the Institute certainly contributes to such exposure and calibration.

14. Promoting Excellence: Fora, Facilities & Incentives:

- PG programmes need special focused care for incentives for providing common for a for the development of professional identity, and to get around hurdles that are typical of open-ended research.

S14.1. a) Travel Funds for Conference: The effort needed to organize funds for attending an International Conference by a Ph.D. student drains off a significant amount of time. The procedure of sanctioning such funds needs be streamlined with a single window application, and terms of approval need be made transparent by making all steps clear at the outset. PGFC can help this process.

b) An international exposure during the period of the doctoral programme has become desirable and can be now considered as an essential achievement marker. This requires hassle-free availability of funds for at least one reputed International Conference.

c) Institute, Departments and Projects must have sufficient provisions for attending Conferences and for thesis related travel, whose annual quantum must be declared and transparently administered.

S14.2. a) Department Library: Though much of Library functions have become digital, the reliance on a Departmental Library for support for students is still a necessity. Some Departments maintain such a Library through their own collection and through coordinated cataloguing with Central Library.

b) Ph.D. students should be encouraged to submit useful suggestions for acquisition of books to their Departmental Library Coordinator.

R14.3. All Ph.D. students must be given a designated work desk after passing the Comprehensive either in common areas (with necessary facilities), or in the Laboratory or facilities central to their work.

T14.4. a) How does one increase the number of awards for PG students, specifically for Ph.D. students? What non-monetary incentives can be made available for excelling?

b) How does one celebrate the achievements of a Ph.D. student such as the first paper (there should be a specific ceremony for this one, since this marks entry into the professional community), a high-profile paper, a significant patent?

c) Even the best of academically proficient student at some point in their doctoral work typically can go through a low – this is typical of a Ph.D. open ended work, and some consider this essential for a significant work or discovery. What support mechanisms (apart from counselling by supervisor) can we provide during this period of intellectual uncertainty? PGFC can be a platform to debate such questions collectively and design possible schemes or solutions.

S14.5. a) Internationalization: There is no alternative to a greater degree of internationalization in our quest for being a world-class university. It forces us to be better networked in the higher education space in the world. We must open up our PG programmes to international students and determine a target percentage of total PG strength to start with.

b) In many disciplines we have some of the leading experts in the field and are equipped with best of facilities comparable to the world. We should invite international post-doctoral applications in these areas with competitive facilities and fellowships (pitched substantially above PMRF). Applications against these positions should be open to all nationalities including those from India.

c) MOUs with International Universities: The efforts towards exchange programmes with International Universities is welcome and is sure to bring benefits both in terms of exposure and calibration. However, steps must be guarded against these becoming one-way streets and emphasis must be on reciprocity. The joint degree programmes must be reviewed after operating for 5 years.

15. Organizational Structure & Functioning:

Principles of PG academic administration: The architecture of academic administration of the Institute is based on a very solid foundation of the separation of powers between administrative hierarchy and academic functionaries even though both branches are manned by faculty members. In areas where concerns overlap for the two branches, one assumes the role of providing advice, feedback, and context, while the other is the decision-making authority. There is no need to change this balance of power, and in fact, it must be respected and further strengthened.

The lynchpin of the administering PG Programmes is the DPGC at the Departmental level, and SPGC at the Institute level. From all accounts, there is a need to streamline the functioning of DPGC.

R15.1. To ensure continuity and a right mix of experience, the members of SPGC can have 2-year terms such that half of all members are replaced every academic year.

S15.2. a) SPGC has larger number of members now with the increase in number of Programmes. It is suggested that it can constitute several standing sub-committees to focus on different aspects of PG administration just as we have PG-APEC. For example, a subcommittee can be responsible for updating and maintenance of PG-Manual, and another one on annual statistics of performance

metrics of different programmes. This is apart from one-time special sub-committees that SPGC forms in order to look at an issue of concern raised in its meetings.

This suggestion has the background that SPGC should closely monitor Programmes from perspectives different from its role as a tribunal implementing the mandate of the PG-manual. It should actively grapple with larger issues of growth and removal of systemic distortions or hurdles in the PG programmmes.

b) The incoming SPGC must hold a half-day 'boot-camp' or a 'resort-conclave' to hold discussion on all aspects of functioning of DPGC and SPGC, and target measures for the academic year ahead.

c) The 'Terminal Report' of SPGC Chairperson presented to the Senate is an important document and should be presented to the Senate in its November meeting. It should include noteworthy details of the SPGC and issues that the newly SPGC must deal with. The Terminal Reports of SPGC should be curated as a separate page on the website of SPGC.

R15.3. a) In cases of academic Performance deficiency, SPGC as a standing committee should be empowered to take final decisions of reinstatement following the standard practices except that only a show-cause for termination be placed initially based on PG-APEC report. Only the mercy petitions in cases of Programme Termination or a 'reappeal' for reinstatement should be brought to the floor of the Senate. This would require SPGC even further care and due diligence in its decision making without passing on all cases of deficiency to the Senate for final approval. However, if SPGC stands divided on a case as per the sense of the house perceived by Chairperson, SPGC, or because of voting in SPGC then the case would also be brought to the Senate for discussion.

b) Routine matters which Chairman, Senate is authorized to approve as a matter of convention and brought to the Senate as reporting items, should be circulated among the Senate members (through possibly a special portal), and they become agenda for discussion in the Senate only if a member the Senate explicitly desires so.

15.4 DPGC Functioning

- Tokenism in Student Representation: In some Departments, there is a perception that the principle of student representation in DPGC is mere tokenism. Any such 'perception' must be changed by proactively seeking students' views through their representatives and requesting agenda items from them before DPGC meetings. The Institute values and accords high priority to student participation in all levels of decision making. The conduct of meetings should take due care of the confidentiality of submission by individuals and be sensitive to possible situations of conflict of interest.

- The students should be encouraged to air their grievances in the appropriate forum without fear. It is incumbent on students and student representatives to take participative academic administration with a due sense of responsibility and raise issues in DPGC or with the HoD without resorting to anonymous social media posts or emails, which vitiate the collegial ambience in which to look for solutions.

- DPGC must have a public calendar of events and meetings with approximate dates linked to SPGC calendar for the whole academic year. All policy decisions, except for those concerning issues of particular individuals, should be duly recorded in minutes and curated at the Departmental website.

- DPGC should, apart from its usual work mandated by the PG rules, monitor the larger issues of PG programmes in the Department in terms of future growth, current problems, and provide considered opinion to its faculty based on statistics of different metrics and indicators of the health of the PG programmes.
- All written recommendations of Convener, DPGC must be 'speaking' recommendations and must be on behalf of DPGC as a whole.

R15.4. DPGC must at least arrange one meeting of all PG students with HoD (maybe separately for Masters' and Doctoral Programmes) preferably before the Mid-semester Examination each regular semester to discuss all aspects that PG students would like to raise and seek feedback on issues of interest. This must be incorporated into the Departmental calendar of DPGC.

15.5. PGFC, as proposed in Section 3, should not be viewed merely as a resource center for services but a platform for improving student experience in all its dimensions.

15.6. The Senate Course Development and Monitoring Committee (SCDMC) should be responsible for all aspects of course review as its mandate. The full operationalization of SCDMC as a standing committee of the Senate must be completed.

15.7. PG Office: Back-office Operations & Documentation

- The back-office operations involving PG documentation and information handling currently employ about 7 out of 17 staff members in the Office of the Dean, Academic affairs. We are fortunate to have a dedicated team, and the workflow is well-organized with a clear service charter. However, backing up operations in somebody's absence has proved stressful. One area of concern is the design of data structures for effective interface with OARS /Office Automation. Currently, there is a move to carry out full digitization of all student records, and it needs an expert embedded within the office system to handle the volume of work in its developmental phase.
- The addition of the Thesis Processing Cell (TPC) for plagiarism check and language support is indeed welcome. The language support services need to be extended and can be embedded in PGFC. More personalized or professional thesis writing services can be made available within PGFC.

R15.6. a) The support staff in PG Office be augmented with a unit to handle independent automation of DOAA operations. The current pace of automation would then be much faster. Data structure implementation.

b) The back-office operations must be partially shielded from in-person visitors with barriers such as providing an online site for queries, and helpdesks at PGFC.

c) The staff involved in Backoffice operations be given incentives to go through refresher hands-on training modules on data and documentation handling exposing them to the latest software, short-cut tricks, and mode of operations.

16. Concluding Remarks & Next Steps:

16.1 Many of the preceding recommendations are formulated so that they can be adapted to different Departments/IDPs , not mechanically, but in the spirit of suitably fitting to the profile and needs of each individual Department. During eventual implementation after acceptance by the Academic

Senate, however, the response towards each recommendation must be monitored by an individual DPGC and should be centrally collated by SPGC.

While concluding, we can remind ourselves some of the general remarks, well-known but provocative nonetheless:

- Our strength has been the academic freedom we enjoy, laced with the willingness to shoulder responsibilities and respond with determination to increased demands on accountability. These are precisely the core values needed to build a strong PG programme.

- A world-class UG programme is often the result of establishing a world-class PG programme. Let us acknowledge that it is possible to attract the best of faculty only through a strong PG programme which is the engine of research and innovation – UGP stands to benefit from the best of researchers designing and teaching its courses.

- It is a myth that time devoted to any academic programme is time away from research. Participating in teaching programmes must complement our research and desire to excel.

- The effects of bold, quality improving steps take time to show results on reputation – but, when they do, they deliver a solid launch-pad for spiraling up. The students are our ultimate ambassadors.

- For a world-class university, that we seek to get recognized as one, we need the world to be involved with and interested in us.

16.2. Implementation following Senate Approval:

I. Departmental Feedback: The Departments/IDPs have already provided their feedback on the first draft circulated in August, 20121. The consolidated section-wise response of the Departments is being attached as an Addendum, which also lists the modifications to the first draft after due consideration of the feedback received.

II. The PGARC-Implementation Committee can set-up tasks for each of the recommendations in a tabular form for Deptt/Senate Committees/Institute. Departments should also opine on which of the suggestions (Syy.yy) are they agreeing to implement. The administrative and legislative routes to implement each of the recommendations should be worked out as the next immediate step.

The proposals or discussion points marked Tzz.zz need not be taken up for immediate discussion or implementation since they can potentially take focus away from concrete steps to be taken next.

III. Increased Granularity in Grading: The new grading scheme as already proposed in the first part of the Report (and repeated in Section 5 above for sake of completeness) is the only one that requires a change in the Statutes. In our opinion it should be applied across all programmes and all batches simultaneously. The date of change in grading scheme can be notified to all stakeholders and should be noted in all transcripts issued hereafter.

IV. Co-ordination with UGARC Recommendations: Departments need to come up with what changes they would like in their structures in the light of PGARC recommendations and point out difficulties and disagreements thereof.

V. All changes in Programme structure and review of courses must be taken up immediately by the Deptt. and SPG. These can be taken up for discussion by the implementation committee, especially in cohorts as listed below:

- EE, CSE, CgSc, PSE
- AE, ME, CE, MSE, NET, EEM
- BSBE, CHE, SEE, MSP
- HSS, ECO, IME, DES
- MATH, PHY, CHM, ES

VI. Observations regarding individual Departments/Programmes are not included in the formal report but do form a part of discussions held during the consultations with Departments. These are typically specific to a department or a group of departments. Some members of PGARC can be co-opted into the implementation committees by invitation during discussion with Departments.

All recommendations and data used in this report have been for pre-pandemic conditions. The effect of the pandemic (being a black-swan-like event) or considerations arising out of it are beyond the scope of the present report.

17. Team PGARC 2020-21

Dr. Amitabha Bandopadhyay
Dr. Nisheeth Srivastava
Dr. Nisant N. Nair
Dr. Parasar Mohanty
Dr. Prashant Bagad (currently on Leave)
Dr. Sameer Khandekar
Dr. Sarani Saha
Dr. S. Vanamalla V.
Dr. Yashowanta N. Mohapatra (Chair)
Mr. Vineeth Vijayan (Students' Senate Nominee)

Secretariat:

(Late) Mr. Kingshuk Dey

Mr. A. Rahman

18. List of Appendices:

I. Discussion Note by Admissions Subcommittee
II. Introduction to Profession & Communication Skills: Course Design
III. PG Seminar Course: Suggestions
IV. Discussion Paper & Survey on MS(R) Programme
V. Discussion Note on PG Placement: PG Students' Employment Prospects

APPENDIX I :

Discussion Note on Admissions

The competition between different institutions to attract the best students for PhD programs is increasing. IIT Kanpur has certainly been the institute-of-choice for many students across India. We need to further strengthen the profile of IIT Kanpur and make it more competitive among universities within and outside India. **Our vision is to make IIT Kanpur as the first choice for PG admission.** To achieve that, we need to focus on the following points:

a) Competitive advertisement and publicity
b) Attractive PhD program for extraordinary students
c) Attractive Integrated PhD program
d) Attract graduates from other IITs and CFTIs for higher studies
e) Attract industry staff to pursue PG program
f) Attract foreign students to pursue PG program

1. **Advertisement:**
   a) One of the best ways to reach out to prospective students about various PG programs is to make use of Social Media. Attractive posters can also be made and publicized widely, by sending printouts to various institutions. A dedicated **"Admissions & Outreach Desk"** will be created under DOAA/PGFC to take care of this.
   b) Short videos and admission posters can be made by each department highlighting various teaching and research strengths of the department.
   c) Advertisements should focus on the following among other points: (i) competitiveness of the programs; (ii) career prospects, and (iii) infrastructure and expertise available for research and development.
   d) The amazing campus life of IIT students, available sports and library facilities, opportunities for extracurricular activities can be highlighted.
   e) Funding support (through Donor Scholarships) are to be highlighted. More donor scholarships to be encouraged for PG students.
   f) Data on the placements of the previous years can be used for attracting students.
   g) Identify certain good institutions across India and outside India (mainly developing countries) and reach out to the graduating students.

2. **Attractive PhD Programme:**
   a) Relaxation of coursework for academically exceptional students
   - Students from other IITs and similar institutes/universities, recognized by the departments, should be able to appear directly for PhD Comprehensive Examination (or a similar exam).
   - There will be no (or reduced) coursework for these students. This will be advised by the department through DPGC, based on the performance of the student in the Comprehensive Examination (or a similar exam).

- Students have the flexibility to take the Comprehensive written test and viva-voce after accepting the offer from IIT Kanpur or immediately after joining IIT Kanpur.

b) Additional travel support for students with exceptional academic performance (as seen fit by departments)

- Students who perform well in their coursework and/or progressed well in their research at the end of their 2nd year of PhD will be offered additional travel support for attending conferences.

3. Attractive Integrated MSc/MTech program

To hold back our own MSc and MTech students[1] who are doing well in their academics for PhD program of IIT Kanpur, the following are recommended:

- Fellowship from the first year for academically exceptional students who register for the integrated PhD program. Academically exceptional students who agree to join PhD program will be offered additional fellowships/travel support for conferences.
- Exit options for the integrated program will be available.

4. Open House for IITK BTech/BS students

This might sound odd but some of our own UG students may be interested in research but they do not consider IITK as one of their options for lack of information. We can hold department-wise Open Houses for final year UG students and highlight our research strengths, possibilities of interdisciplinary research programmes, etc.

5. **One year Master's Program (or with a similar suitable name) for People from Industry:**

To attract people from industries for joining the Master's degree at IIT Kanpur, we plan to design a one-year Master's program. This will be a fast-paced program with higher credit requirements than the usual program. Here, a large number of courses will be offered through flipped-class mode, and summer semester will be also made use of. Another possibility is to make use of the E-Master's program that is currently under consideration by the Senate. Instead of a thesis, the candidate will do a project. The candidates will be considered under the existing rules for "sponsored students" for admission, which includes relaxation of qualifying exam (like GATE etc.).

PhD Program for People from Industry:

To attract people from industries to join IIT Kanpur's PhD program the following are proposed:

a) PhD admissions based on a collaborative work with a faculty member.
b) Such candidates will be admitted as "sponsored" students.
c) No scholarship will be provided to such candidates.
d) TA duty is optional.

6. Attracting Inernational Students:

Currently, very few foreign students are coming to IIT Kanpur for PG programs. The "Study in India" program attracts only a small number of PhD students. However, admissions through "ASEAN PhD fellowship" are likely to increase the flow of PhD students from ASEAN countries coming to IIT Kanpur. The former program offers no fellowship and fee concession, while the latter provides attractive fellowship and research support, and the fee structure is at par with Indian students.

The existing eligibility criteria for foreign students are to be continued. To make the PG programs more attractive, we propose:

a) Give Institute Fellowship based on "GRE" and "TOEFL" scores and consistent academic and/or research performance. An appropriate cutoff for GRE/TOEFL can be given by the department for getting scholarship.
b) Note that provision for fellowship to a foreign student is already present if he/she is GATE qualified. Non-GATE qualified foreign students can be encouraged to clear GATE in the first year.
c) Advertisements can be sent to foreign universities about our PG program (both PhD and MTech) and encourage the interested students to write GATE exam.

7. Suggestions for Discussion:

- Propose a new webpage www.iitk.ac.in/admissions with following features:
- Better display of areas of research (brochure for admission is poorly done)
- Ability to search for expertise/field on the webpage
- Non-degree program *[but certificate courses]* can be expanded further for attracting a good pool of people from industry/defense etc.

This Discussion Note on Admissions is prepared By Dr. Nisant N. Nair and Dr. Prashant Bagad for discussion within PGARC.

APPENDIX II :

Introduction to Profession & Communication Skills; Credits : 06

Suggestions for Course Design

If it is being planned as a single course, themes from different parts can be suitably sequenced to keep the course interesting and students active in tasks and assignments.

Part A : Introduction to Profession (Discipline Specific):

Units	Themes	Indicative Contents
A.I	Knowledge Society:	The place of the discipline in the larger knowledge canvas; Key developments in the history and impact on related disciplines
A. II	Modern Streams of the Profession	-Themes at the boundary of the discipline -Current Research & Development Trends
A. III	Career Choices: Aptitude, Challenges & Opportunities	-Academia -R&D Labs -Industry -Interdisciplinarity -Changing Track -Start-up culture
A. IV	Professional Ethics:	-Work Place Pressures -Best Practices -Collaboration: Best Practices & Dangers -Ethical Traps
A. V	Modern Sceintometrics:	-Parameters & Numbers -Networking Maps -Obsession with measuring Scientific output.
A. VI	Mechanics of Publishing /Patenting & Bidding for Projects and other Resources	-Various Stages of Paper publishing in Journal -Dealing with Rejection, Reviewer's Comments -Intellectual Property Rights; What can be patented? -Mechanics of Project Submission & Approval -Developing Laboratory and Attracting students - Industrial Teamwork, International Collaboration

This part is best handled using Group Discussion and Active Student Participation.

Part B: Communication Skills

Units	Themes	Indicative Contents
B.I	Technical & Scientific Communication:	Centrality, Forms & Significance Target Audiences; Understanding Audience needs
B.II	Basic Principles of Scientific/Technical/Report Writing	-Writing a good paragraph -Developing a pattern of Organization -Common types of Arguments
B.III	Scientific Journal Papers	-Types and Forms -Writing Introduction -Abstract and Summary -Styles of Organization -Style Manuals
B.IV	Oral Presentation	-Forms: Full length Talk; Conferences; Posters -Organization of Slides and Styles -Visual Elements & Representation of Data -Handling Maths in Presentations
B.V	Readability and Clarity	-Information Selection -Information Ordering (sentence, paragraph, and document) -Editing for Emphasis -Cohesion -Common Problems with Voice, Connectives, Relative Clauses, Articles, Verbs, Modal Verbs, & Punctuation.
B.VI	Plagiarism	-What is it ? -Author's Responsibilities and Rights -Forms and Standards -Plagiarism checking and Avoidance Aids - Primacy of Credit in Scientific Community

This part and the whole are best handled using case studies and hands-on tasks.

APPENDIX III :

PG Seminar: Course Design **Credit: 0**

The course would have the dual purpose of

a) familiarizing the PG students on the current themes and progress as presented by their colleagues, and
b) in the process would learn best practices in Oral Presentation and preparation for talks.

Both these objectives need sustained exposure over many semesters, and it need be a weekly habit of attending such sessions.

Challenge: To keep the students interested in the process. They will sustain interest if the time they spend regularly attending and occasionally preparing a good seminar is worth the effort.

Suggested mechanism of conducting the course:

- Each student prepares and gives a seminar typically delivered by students in a format of short oral presentation (of 15 minutes) in an International Conference.
- Not more than 3-4 slots can be used for a colloquium-like lecture from visiting experts, faculty members from within the Deptt./IDP, or invited from other Deptt./IDP.
- The topic/ paper (problem centered ,not descriptive, with one dominant take-home message) is chosen by the student in consultation with the Thesis Supervisor/Instructor.
- The presenting student writes an abstract and sends the notice to the Instructor for circulation at least 3 days in advance.
- Typically two students (one from M.Tech. and one from Ph.D.) present in the weekly slot.
- Discussion on both the content and the presentation style (slide deck, delivery etc.) is discussed among students under the Instructor's moderation.
- The seminars are video recorded for the speaker to go through them later in light of comments made.

The thesis supervisor of the presenting student also attends the presentation.

The mechanics of arranging the speaker list, ensuring all aspects of the conduct of the course are left to the PG students.

The Instructor moderates the discussion and gives helpful comments about how the seminar presentation could be better.

Note: Master's students take the PG Seminar Course for at least three semesters and Ph.D. students for six semesters.

APPENDIX – IV : MS-R Survey & Discussion Note

MS(R) STUDENT SURVEY: REPORT

An exclusive survey for MS(Research) students is conducted

1. To understand the difficulties faced by students
2. To collect their opinion on various academic policies governing the program
3. To assemble the feedback of MS students on how to improve the mentor-mentee relationship in research-based programs.

A total of 66 students from various departments participated in the survey.

Tables I and II give an overview.

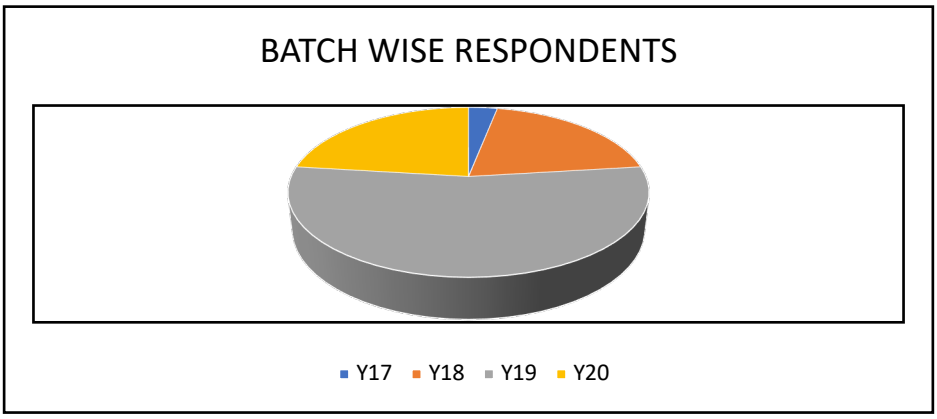
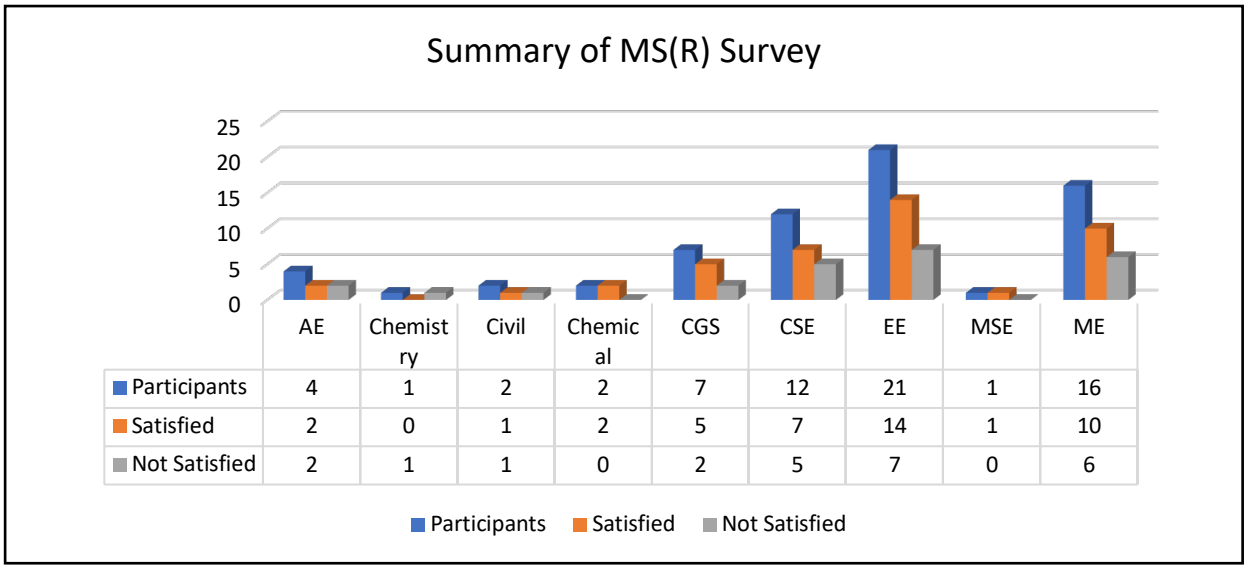


TABLE I. BATCH-WISE RESPONSE



	AE	Chemistry	Civil	Chemical	CGS	CSE	EE	MSE	ME
Participants	4	1	2	2	7	12	21	1	16
Satisfied	2	0	1	2	5	7	14	1	10
Not Satisfied	2	1	1	0	2	5	7	0	6

Table II. Summary of student's response

Among the respondents, 36% expressed dissatisfaction with the academic policies governing the program. The main reasons are summarized below:

1. STIPEND:
   Being a research-based program with an external thesis review, MS takes more time than M. Tech students. But stipend is provided only for 22 months for MS students forcing them to either compromise on the quality of research or bear the expenses themselves. It is often brought to our attention that supervisors expect more work from MS students to extend the program.

   There is a common demand from MS students to extend the financial support for another six months.

2. SHARED HOSTEL ACCOMMODATION
   Considering the nature of the program and expectations from many supervisors, most MS students take more than two years to finish their course requirements. Without considering this, the institute forces these students to shift to shared accommodation immediately after two years—this impacts the academics during the final stages of the course, which should be addressed.

3. PLACEMENTS
   For the placements, recruiters do not give equal treatment to M. Tech students. It is widely believed that the institute/ placement cell has not provided enough awareness to the companies about the academic rigour associated with MS programs.

4. LACK OF GUIDANCE (ORIENTATION)
   MS is a new program; very few seniors are available to take advice from.

   Orientation should be, hence stronger with a dedicated point of contact on the faculty side.

   Students are facing trouble while choosing supervisors. There is no specific guide selection policy in various departments for PG students.

5. LACK OF STUDENT REPRESENTATION
   Most PG student representatives belong to M. Tech programs, and many MS-related issues are not appropriately addressed.

6. COURSE RELATED ISSUES:
   Winter batch students are missing fundamental courses, which are prerequisites for the subsequent periods.

7. OUTDATED PG MANUAL:
   PG Manual needs immediate updating.

8. LACK OF ENCOURAGEMENT FOR INTERNSHIPS/ COLLABORATIONS

9. MENTOR-MENTEE RELATIONSHIP:
   a. Supervisors not attending MS students.
   b. Some professors pay their students, whereas some don’t. Supervisors may give financial support to the students through projects.
   c. Students should be allowed to sit for placements.
   d. Students expect some level of freedom in choosing courses.

RECOMMENDATIONS of SURVEY:

I. Institute/ supervisors may grant extended financial support to MS students. Thirty months maybe a justifiable period.
II. The need for an external thesis evaluation may be revisited, considering the delay in review and course completion.
III. Shifting accommodation during the advanced thesis stages must be avoided.
IV. MS Students should get more placement opportunities. Special attention is needed by the placement cell.
V. Institute may reserve a position for MS students either in the senate or SPGC.
VI. Urgent updating of PG manual.
VII. Supervisors may consider giving sufficient time for MS students.

The survey was coordinated and reported by Mr. Vineeth Vijayan (Ph.D., EE).

Discussion Note on MS by Research

Due to their low numbers, the predicament of MS by Research (MS-R henceforth) students is frequently overlooked in discussions about students' welfare. Out of a total of 3229 PG students registered during the 2019-20-I semester, MS-R students accounted for a paltry 4.4% (141 in total). MS-R students are overwhelmingly concentrated in a small number of departments, with CSE and EE together accounting for more than half the registered students.

The MS-R programs at IITK are an ungainly hybrid of two different models of academic engagement. There are two modes of admission into MS-R programs – sponsored and non-sponsored. Non-sponsored MS students are selected using more or less the same criteria, receive more or less the same stipend, and pass through more or less the same academic curriculum as MTech students. The major difference in their academic experience vis-à-vis MTech students is that their thesis evaluation procedure mirrors the PhD track, with an external examiner's reviews solicited.

Sponsored candidates share the same academic experience but differ from non-sponsored candidates in the sense that their admissions are non-competitive, and their stipends are either guaranteed by an external agency in direct correspondence with the candidate, or by the PI of a sponsored project within the institute (for one year). Project-sponsored MS-R students are only assured a stipend in their second year if (a) the project PI is willing to continue to pay them from their project or (b) they possess a valid GATE score.

PGARC conducted a survey of MS-R students, asking them about their experiences in the program, probing for problem areas and asking for suggestions. An analysis of the most significant pain points in the MS-R program, and suggestions for easing them is given below.

1. **What is the difference between non-sponsored MS-R students and MTech students?**

Situation: Except for the CGS department, which does not have an MTech program, these students are selected using the same processes and criteria that the respective departments use to select MTech candidates and undergo the same academic experience, and yet are severely

hamstrung in two serious ways. One, they are not permitted to sit in placements. Two, their thesis review process is substantially longer and unwieldier.

Explanation: Since at least some MS-R students are selected non-competitively, it may be reasonable to not permit them to sit in campus placements alongside students selected competitively. For similar reasons, it may be reasonable to require greater accountability in assessment of thesis quality. Crucially, both these features appear to be targeted primarily at sponsored MS-R students, who have been selected non-competitively.

Solution: Encourage non-sponsored MS-R students to change their degree to Ph.D. using existing provisions. Allow other non-sponsored students with GATE to use SPO for placement.

2. **How do we handle the problem that thesis work frequently exceeds stipend duration?**

Situation: Partly because of the greater expectations of rigor induced by the prospect of external review, and partly because concrete project deliverables frequently require more iteration and refinement than blue-sky research, many MS-R students complain about the open-ended nature of the duration of their degree, in contrast with the definitive finitude of their stipends.

Explanation: Candidates sponsored by external agencies are unlikely to face this problem, since the term of their thesis work, and extent of financial support is negotiated between the external agency, the thesis supervisor, and the student. To the extent that this is a concern for non-sponsored students, this could be considerably alleviated by adopting PGARC's recommendation for problem 1. The case that needs closer consideration is the case of project sponsored MS-R students.

Solution: Require PIs to guarantee stipends for the entirety of the student's degree up till the month of thesis submission for external review, contingent on the student receiving no more than one X thesis grade in any semester.

3. **How do we ensure winter admitted MS-R students are treated fairly during supervisor selection?**

Situation: Students admitted during the winter semester must select their supervisor after having completed a single semester's coursework. Many of them complain that this restricts their choice of supervisors.

Explanation: In many departments, potential supervisors screen applicants based on attendance in their courses. Thus, students selected during winter admissions end up with a more restricted set of supervisor options than students selected during summer admissions.

Solution: Allow winter admissions to defer joining until Fall.

[*This Discussion Note was prepared by Dr. Nisheeth Srivastava based on the Student Survey Report*.]

APPENDIX: V

PG students' employment prospects at IITK

PGARC 2020-2021 Discussion Draft

Introduction

Even more so than undergraduate education, which may perhaps focus more generally on educating young adults in a holistic sense, effective post-graduate education must be strongly guided by prospective employment requirements. Someone doesn't come to grad school to be *educated* - they come to improve their skill-set vis-à-vis their employment sector's expectations, whether this sector be academia or industry.

Revisions to IITK's post-graduate curriculum and/academic infrastructure supporting PG education, must therefore take extensive cognizance of trends in placement opportunities for our graduate students in recent years, so that revisions may place our students at an advantage. In this draft paper, we lay out some trends that are currently discernible using available statistics and qualitative inputs from stakeholders, and present some recommendations based on this information.

Frame of reference

This document focuses on

1. examining trends in placement opportunities for our graduate students in recent years, and
2. identifying potential curricular interventions that may improve such opportunities in future.

Data sources

We used the following data sources for developing this report:

- M Tech students' placement statistics from SPO
- SPGC annual reports from 2006-2017
- Relevant sections from M Tech and PhD students' feedback from different departments during PGARC meetings with student representatives
- Department-wise faculty inputs obtained via email upon requests to HoDs of all departments and programs
- Relevant sections from PhD Scholars' Critical Survey 2017
- Department-wise external recruiters' inputs obtained via consultation and emails by PGARC members vis-à-vis PhD recruitment.

Data sources

Placement trends for M Tech students

Any analysis of placement opportunities must focus on trends in recent placements, and project these trends forward in order to identify how best to adapt our curricula to prepare PG students for placement opportunities in future. To identify recent placement trends for M Tech students, we asked the Placement Office for the following statistics

1. Percentage of PG students sitting for placement who received a job offer
2. Percentage of PG students whose job offer was for a software development profile (TCS/Wipro/Infosys etc.)
3. Percentage of PG students whose job offer was for an analyst profile (e.g. from Goldman Sachs, GE finance etc.)
4. Median salary for PG students receiving an offer from companies for (a) software development positions, (b) for analyst positions, and (c) for all other positions.

Our interest in asking these questions was to quantifiably measure the extent to which the core curricula taught in different departments actually aligns with the job profiles that our post-graduates move to. It is a common observation in UG placements at least, that most students join software jobs irrespective of their departmental pedigree. Since PG students are expected to obtain more specialized knowledge of their respective disciplines, a large mismatch between curricular training and job profiles at this level should be a source of concern.

The responses received from the SPO so far are tabulated below

Statistic	2017-18	2018-19*
Placement percentage	80%	78%
Percent placed in software dev	23%#	19%
Percent placed as analysts	21%	21%
Median salary (software)	17.1 LPA	20.5 LPA
Median salary (analyst)	11.2 LPA	11 LPA
Median salary (other)	11 LPA	12.5 LPA

* placement statistics for 2018-19 reported up to end of 2nd round of placements.

Intel hired for both software and hardware positions, which are both reported under this head inflating this statistic somewhat

We can draw the following inferences from these statistics:

1. The majority of our M Tech students do not go to generic jobs that are unrelated to their core discipline. That is, there is substantial core recruitment from the M Tech program.
2. Software jobs have a large (50+%) premium in term of salary, which could explain M Tech students' enthusiasm for CSE courses.
3. A significant proportion of M Tech graduates (one in five) don't get a placement offer. Need long term statistics to see if this is something to worry about.

Suggestions for M Tech placements

1. Make placement statistics in different job profiles and positions available to M Tech students early in their tenure here, so they can select courses and projects to match their industry-centric interests

2. Identify causes for poor placement outcomes from placements data

Suggestions for M Tech curriculum

1. Retain departmental specificity in curricular offerings; restrict cross-department course work and IDPs in course templates, considering the prominence of core job placements for M Techs
2. Consolidate and rationalize core offerings within departments keeping recent placement trends in mind (being adaptable is not equal to selling our soul)
3. Rationalize CSE course registrations for non-CSE students

Placement opportunities for PhD students

Unfortunately, since SPO does not handle PhD placements, there are no centralized statistics available to document how PhDs from our institute have been doing lately after leaving us.

The PhD Critical survey breaks out PhD students' perceptions of their department into specific aspects of the PhD experience, but, critically, does not do so in terms of students' perception of placement opportunities. This aspect is only described at the Institute-wide level, and an overwhelming majority of the PhD students responding to this survey (83%) feel that their placement opportunities are limited, and that this limitation is a weakness of IITK.

On the other hand, industry middle management across disciplines (ABB, Adobe, TCS, IBM) have represented to members of this committee that they are very keen to hire PhDs from IITK in their respective areas.

<u>This is a glaring disconnect.</u>

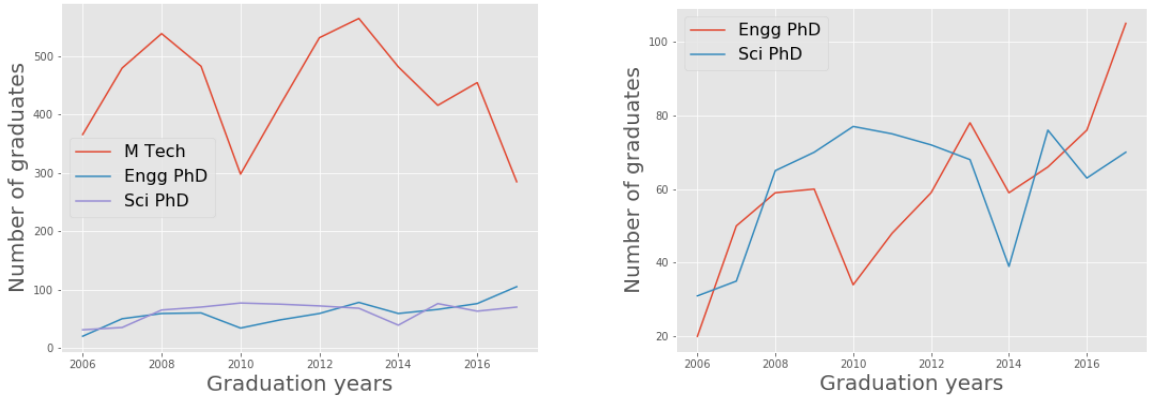


Figure IV.1: *Graduation statistics for M Tech and PhD students from IITK (2006-2017 graduation years). Statistics displayed are tabulated from SPGC. BSBE PhD graduates are counted as science PhDs for this calculation.*

What could be the cause of such a disconnect? Figure 1 shows a massive spike in the number of PhD students graduating in 2017, the year the survey was taken. Whereas the number of science PhDs who, broadly speaking, go on to teaching positions, has remained nearly constant over the course of the previous decade, the number of engineering PhDs, at least some of whom are likely to attract industry recruitment interest, has grown substantially. The increased perceived precarity of placement opportunities could, therefore, be driven by lack of information about industry opportunities in the rapidly increasing cohorts of engineering PhD candidates in our institute. This inference, naturally, requires further corroboration at the departmental level.

From Figure 1 above, we see a clear separation in the growth trends of engineering and science PhDs in our institute. Whereas we have been producing an increasing number of PhD graduates over the past decade, the number of science PhDs we are producing is more or less the same as a decade ago on an annual basis. Clearly, there is some underlying rationale for this difference. PGARC members from science disciplines have expressed the view that their graduates have no employment opportunities except in higher education.

Therefore, projecting the future intake of science PhDs at IITK requires a projection of the demand for higher education in the country. The number of higher-education institutions in any country is heavily influenced by projections of population growth as well as projected increases in gross enrolment ratio (GER). That is, the number of students expected to enter college in any given year will be GER times the size of the college-entering cohort, which will rationally inform the supply of college education in the country.

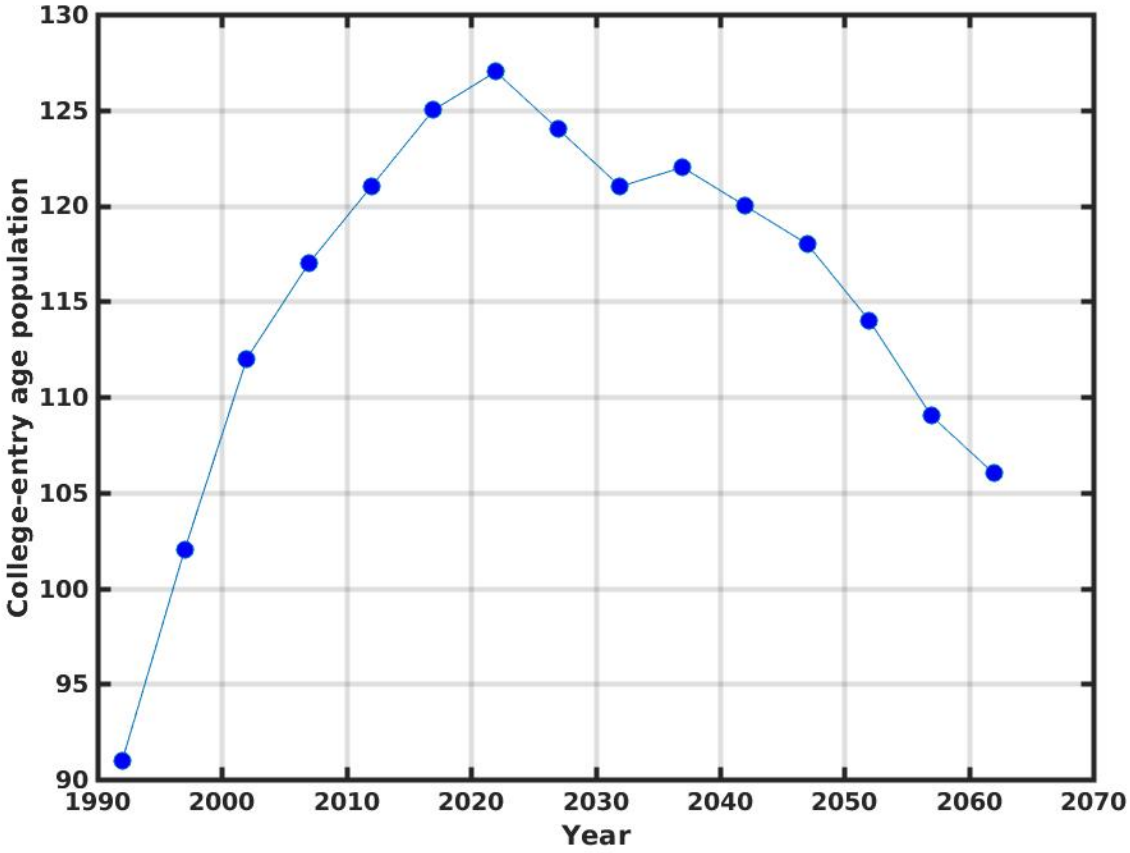


Figure IV. 2*: Empirical data (up to the year 2025) and demographic projections for the size of the 15-19 age group cohorts in India (1990-2070)*

Restricting our focus on the time period for which the 2021 ARC must make recommendations, it is evident from Figure 2 that population growth will actually contribute negatively to such projections going forward. All potential increases in the size of college-entering cohorts for the next half-century will come from increases in GER. The GER in 2004-2005 was close to 10%, whereas the present GER (2016-17) is 25.2% (statistics from data.gov.in). The year-on-year increase in GER is approximately 7%. If the GER growth rate is *x*, a simple calculation shows that successive college-entering cohorts may be smaller by at most $x/(1+x)$ for the absolute number of college entrants to remain constant. Over the period of the next ARC, the college-entering cohorts will decline by about 0.5% in size on an annual basis.

There are two ways to interpret these observations in light of the momentous change in the population trajectory of the country expected to happen in the coming decade.

One is to focus on the doubling of the Indian GER for higher education in the past decade, and the fact that the current GER is nowhere close to levels seen in other countries (China is at about 43%, the US at about 85%). Since the decline in the size of future college-entering cohorts (0.5% annually) is heavily outweighed by increases in GER in the near future, the net effect will be a minor reduction in the rate of increase of college-entering cohorts.

The other is to observe that the change, while small in absolute terms (0.5% decline vs. 1.5% increases in the preceding 30 years), is massive in relative terms. Effectively, an approximately 1.5% organic boost to growth rates of college-entering cohort sizes will for the rest of the 21st century, be replaced by a 0.5% drag on the same. Given that the other contributor to growth - GER - is increasing has been increasing at about 7% steadily in the past couple of decades, the net effect of the change in the population trend will manifest itself approximately additively (zeroing out a multiplicative interaction term), such that what was previously an 8.5% growth rate in absolute student counts will now onwards be a 6.5% growth rate, a 23% reduction on the margin.

The former view is reasonable for departments wherein PhD students are having no trouble finding desirable academic jobs. Given the expanding size of college-entering young adults for the foreseeable future, departments where current demand for prospective faculty recruits is greater than supply need worry very little about the impact of the change in the demographic trend.

The latter view becomes more salient for departments wherein PhD students are already struggling in terms of placement opportunities. If some departments are already struggling to find academic jobs for their graduates, a ~25% marginal reduction in available opportunities is likely to be a cause for heightened concern.

Since our current growth in science PhD graduates is already low, students feel that placement opportunities are already limited, and demographic headwinds clearly loom on the horizon, it appears unlikely that there are many organic drivers for growth in science PhD graduates in the upcoming decade. On the other hand, the country's industrial capacity and infrastructure are expected to improve, suggesting that the ongoing increase in engineering PhD graduates is likely to sustain or potentially increase.

On balance, therefore, it looks like the IITK PhD program will be dominated by engineering discipline PhDs in the near future. At their current rates of growth, averaged over the past decade, IITK will be producing nearly thrice as many engineering PhDs as science PhDs by 2030. Given limited opportunities in higher education teaching, the bulk of these graduates will be looking for jobs in the industry. This could place them on par with graduates from our UG and M Tech programs in terms of their placement needs.

Suggestions for PhD placements

1. Institute can present a template for an academic jobs board that PG students can populate discipline-wise or department-wise
2. Institute must emphasize in PG orientation that a PhD is a terminal degree, but not a job guarantee. The workplace is too volatile for someone with a narrow specialization to have high employability
3. Increase the visibility of alt-ac job templates for PG students
4. Academic track PhD students should receive some exposure to pedagogical methods, perhaps via an IDC course
5. Industry-affiliated PhDs should be encouraged; joint funding possibilities must be facilitated by Institute rule changes
6. PhD students may be permitted to participate in SPO placements.

Suggestions for PhD curriculum revision

1. Pay PhD students their regular stipend if they choose to do a summer internship in some recognized institution or company away from IITK in the summer (this is to incentivize students' engagement with industry problems).
2. Remove publication requirements for PhD graduation (this is because industry track PhDs don't need a publication record).

(*The Discussion Paper is put together by Dr. Nisheeth Srivastava for internal discussion within PGARC.)*

----------End of Report Version 2.2 ----------

Modifications in PGARC Recommendations in response to suggestions in 547th Special Senate Meeting

In the 547th (2021-22/5th) Special Senate meeting (April28-29,2002) to discuss PGARC recommendations, several suggestions were referred to PGARC for consideration as summarized in the minutes (Annexure-I). In response to these the following modified recommendations to the final report are being included in the **Revised Version 2.2 of the PGARC Report.**

A. Exit Option as a Standard Feature in Ph.D. programmes of all disciplines
B. Reconsideration of restrictions on number of degree extended students under a Supervisor
C. Suggestions (i) regarding registration of degree extended students, and (ii) waiver of residence requirements beyond the minimum required.
D. Project Report instead of M.Tech. Thesis as an Exit Option with M.Tech.(Project Report) degree
E. Non-residential M.Tech./MS programme (Industry Experience)
F. Modifications in Recommendations for MS-R.

The new or modified recommendations are enumerated below.

A. Exit Option as a Standard Feature for all Ph.D. programs

In the 547th (2021-22/5th) Senate meeting, it was proposed that the PGARC committee should look into the possibility of introducing exit options for all PhD programs.
The existing Senate approved criteria for exit from the PhD program is only meant for the PhD in Engineering, and is reproduced below for easy reference:

Clause 7.8 of the PG Manual says:

"7.8.1 If a Ph.D. student in an engineering department does not hold a master's degree in engineering, he/she may exit from the programme with an M.Tech. degree provided

(i) a request to this effect is made at least six months before the exit but not before the student has completed two-and-half years (excluding the period of sanctioned leave, if any) in the programme;

(ii) the request is approved by the Senate on the recommendations of DPGC and SPGC; and

(iii) the student has completed all the requirements of the M.Tech. degree (including a thesis).

7.8.2 If a Ph.D. student is in an engineering department and holds a master's degree in engineering or if the Ph.D. student is in a non-engineering department, he/she may request with proper justification to exit from the programme with a degree/diploma. The request has to be recommended by the thesis supervisor, DPGC and SPGC and approved by the Senate. The student opting for exit option may be considered for the award of M.Tech. degree or any other form of degree/diploma, depending on the completed course/research work.

7.9. A postgraduate student may withdraw anytime from his/her academic programme, provided he/she makes a written request to this effect, and his/her request is endorsed by DPGC and approved by SPGC. A letter of withdrawal will be issued by the Head of the Department/IDP of the student."

PGARC recommends generalization of these clauses to introduce Exit Option for all Ph.D. programs.

R.8.12 Exit options for PhD.

The current exit options are to be modified as follows for all PhD programmes (including Sciences, Engineering, and Humanities and Social Sciences):

i. MTech/MA/MS/MSR degree is proposed as the exit degree for PhD in all the disciplines.
ii. The candidates should fulfil the MTech/MA/MS/MSR degree requirements.
iii. Departments which are not having an MA/MS/MSR program have to propose an MA/MS/MSR exit-degree program and its requirements.
iv. A PhD student can opt for the exit option at any point of time in his/her PhD tenure after completing the required coursework.
v. MTech/MA/MS/MSR thesis/project guide will be assigned by the DPGC Convener.
vi. A student failing in the comprehensive examination for two consecutive times may, on the recommendation of DPGC, shifted to the exit track of M.Tech./MA/MS/MS-R programme.
vii. All Ph.D. students in the exit track of a Master's Programme be permitted with consent of the DPGC Convener to participate in SPO placements anytime after their fourth semester in the Ph.D. programme.

B. <u>Reconsideration of restrictions on number of degree extended students under a Supervisor</u>

8.9 Ph.D. Students not receiving any Financial Support:

A student typically starts her PhD journey at the age of 23 or 24. After five years, when financial support in the form of fellowship from the funding agencies, DoE/CSIR/DBT/ICMR etc., is stopped by law, the student is 27 years old. At that age, the student again becomes dependent on her parents for day-to-day sustenance and also for payment of the tuition fees. The situation is worse for those students who have dependent parents and/or a family of their own.

A student's PhD duration can get extended beyond five years for a variety of reasons, including but not limited to the student's health/family issues, change of the thesis topic for unavoidable reasons, delay in procurement of equipment/consumables/repair etc., time taken to write/edit/revise the thesis manuscript and so on. However, as per the current system, no matter what the cause behind it, the student gets penalised severely. This needs to change.

Engaging in PhD work without a source of sustenance, among other things, severely affects the mental health of a student, which compromises their likelihood of succeeding in doctoral research. Also, a doctoral programme is often judged not by its successes or by its large number of regular students, but by the minority whose work gets delayed for one reason or another and is without any financial support. A survey of popular social media platforms will reveal that educational institutions are severely criticised for this one reason by their own students. This in turn is already severely affecting the perception of IIT Kanpur as an employer.

In the 2019 data, the percentage of PhD students receiving no financial support from any source stood at 9.65% (175 students)—a number too high for any PG programme under Indian conditions. For a particular department, it is as high as 18% and 40% for a relatively small programme. Only 10 students (0.55%) were receiving funds from sponsored projects. The number of students without financial support must be immediately brought down to less than 5%, and to less than 1% within the next five years.

- The objective of the recommendations in clauseR8.9 is to (i) minimize the number of students without any form of adequate financial support; (ii) minimize the financial burden on the students and (ii) to instil a sense of community involvement in solving the problem of our students.

R8.9.

Any faculty member who has more than oneMoE-funded PhD students who are not receiving financial support from the Institute or the PI and have not yet delivered their open seminar, should not be allowed to take a new student funded by MoE.
This restriction excludes from consideration students reinstated by the Senate following termination as well as special cases identified by DPGC on a case-by-case basis.

C. Additional Suggestions

S8.11. It is suggested that for the degree extended students (with or without financial support), tuition feemay be waived if the minimum total credits as per the PG manual is completed.

R8.12.Residency requirements beyond the minimum for PhD students canbe waived.

D. Project Report instead of M. Tech. Thesis as an Exit Option:
(included as R9.7 in Revised Version 2.2)

The current M. Tech. programme is a 24 month time bound programme with Ministry of Education (MoE) scholarship for 22 months for eligible students. The extension of the degree beyond the time limit should be strictly discouraged and be allowed only for specific cases with possible restrictions on residential facilities.
The current 'M. Tech.' degree requires a student to complete a full thesis. This is the regular M. Tech. programme in which a student is admitted to the institute. Accordingly, in principle, an exit degree cannot be named otherwise.
However, if the student is not able to complete the requirements of a full thesis in the stipulated time as per the departmental norms, then the student can be offered an alternate degree, called M. Tech. (Project Report), as an exit option. The degree will have an annotation, distinguishing it option from the regular M. Tech. degree certificate in which the student was originally admitted.
The following procedure of exercising the exit option is suggested:
(i) The modalities of executing the M. Tech. exit Option should be left to the individual departments.

(ii) The final decision of whether a student graduates with regular M. Tech. (with Thesis) or exit option M. Tech (with Project work not amounting to Thesis) should rest with the thesis supervisor to ensure a threshold quality of academic thesis work which is commensurate with the departmental expectations and acceptance of academic standards. This decision can be conveyed to the DPGC by the end of 20 months in the programme.

(iii) The Thesis Examination Board can also recommend the award of M.Tech.(Project Report) degree if it finds that the submitted 'Thesis' document does not fulfil the requisite academic quality requirements and merits to be a 'Project Report'.
(iv) The regular M. Tech degree certificate be referred to as **M. Tech (with Thesis)** and the exit option degree certificate be named as **M. Tech. (with Project Report)**.

(v) Further it is suggested that the transcripts associated with the degree certificate M.Tech. (Project Report) should include the annotation ***M. Tech. degree awarded with the submission of Project Report not amounting to a full Thesis.***

(vi) Delay in completion of M. Tech. program can be effectively controlled with this EXIT option.

E. Non-residential M.Tech./MS programme (Industry Experience)

(included as **R9.8** inRevised Version 2.1)

It is noted that even now, as per the PG manual, MT students can visit an industry/research laboratory for an extended time period during their ongoing regular program (typically after completing their required course work) for interacting with industry/research labs, for data generation or usage of any special equipment characterization tool etc. This option is always open and should remain open. In addition we recommend that the two following degrees can be introduced :

(a) M. Tech. (Industry Experience) - with regular full thesis option

(b) M.S. (Industry Experience) - with project report option

Non-residential MT (Industry Experience) entails going out of the campus for two full regular semesters (and in addition, the Summer term after the second semester, if required/decided), wherein the student will essentially complete major academic work towards the thesis while staying in/with the industry/research laboratory. The suggested modalities for these options are as follows:

i. At least one external supervisor (Suitable academic qualifications and experience) should be available from the participating industry/research laboratory.

ii. Since individual industries will have different working terms and conditions (as regards IP sharing, Sponsorship, lodging boarding arrangements etc.), individual faculty members, Office of Dean R&D in association with Office of DOAA, Institute level functionaries should facilitate relevant MoUs with industries to facilitate such a IITK Industry-Academia MT (Industry attachment) program.

iii. Individual departments should also make attempts to contact interested industries who are willing to accept our students and have meaningful academic outcomes, beneficial for all stakeholders.

iv. Going out of the campus for this program should only be permitted if all regular required coursework towards the M.Tech. degree is complete.

F. Modifications in Recommendations for MS-R

From the discussion in the Senate, it emerged that there was considerable interest in making the MS-R program more project-centric, in line with the original intentions of this program. Towards this end, we are happy to revise one of our earlier recommendations to make it more specific, and to offer two new recommendations for the Senate's approval. All three are targeted at providing project PIs more freedom to recruit talented employees with the promise of concurrent academic progression via the MS-R program. We have also revised recommendation 10.2 to make it consistent with the new recommendations made for the program in light of the Senate's suggestions.

R10.1. Currently, only 6% of the students in the MS-R programme are sponsored by projects, a serious anomaly for a program explicitly targeted at project employees. To restore the original objectives of the programme most of the students in this programme should be sponsored by projects or external organizations. To shift the intake of this program in this direction, we recommend that at least 50% of the seats filled in MS-R admission in each department in a year must be against project funding. This percentage may be revised upwards by the Senate in 3-5 years to 75%.

S10.2.a) Non-sponsored GATE students (admitted with GATE and receiving Institute funding) should be treated as MTech students for the purpose of placements, i.e. companies open to MTechs in a Department should be open to MSR students in that Department also.

b) If a Department opts for winter admission (second semester) in addition to first semester admissions, and has winter semester course offerings which require exposure to first semester courses, students admitted in the winter may be permitted to defer admission or course registration to the first semester.

R10.5. We recommend that the 24-month waiting period before project employees can become eligible for joining the MS-R program be removed for project- and externally-funded (but not Institute or self-funded) entrants, such that MS-R degrees can be offered as incentives for joining projects to talented potential employees. The admission process for projects and externally funded MS-R candidates should be similar to that of Walk-in interview for Ph.D. programme.

R10.6. We recommend that the requirement of external review of the MS-R thesis be removed,bringing its evaluation in line with current practice for MTech theses. This will improve the timeliness of thesis completion for such students, as well as avoid IPR conflicts that are very prevalent in more industry-centric research problems typically addressed by project- and externally-funded MS-R theses.

Amitabha Bandopadhyay *Nisheeth Srivastava* *Nisanth N. Nair* *Parasar Mohanty*

Sameer Khandekar *Sarani Saha* *SriVanamalla V.* *Vineeth Vijayan*

Yashownata N. Mohapatra (Chair, PGARC)

June20, 2022

Annexure : Minutes of the 547th Special Meeting of the Senate held on April 29,2022

Minutes of the 547 (2021-22/5th) meeting of the Senate held during Thursday, April 28, 2022 over interactive e-portal and on Friday, April 29, 2022 at L-16, LHC, IIT Kanpur

SL. NO.	ITEM NO.	DESCRIPTION OF ITEMS	PAGE NO.
1	**1**	To consider the final report of PGARC'2020-21.	**1**

The Chairman, Senate thanked the PGARC chairperson and other members for a comprehensive report. The Chairman of PGARC gave a brief summary of the report.

The Senators appreciated the PGARC report in general and gave many constructive suggestions while welcoming the granular grading scheme, setting up PG facilitation centre, introduction to communication skill, profession as compulsory course, compulsory seminar course and special topic capsule course.

There could be no consensus on whether a thesis should be mandatory for an MTech degree and the idea of Mtech. (non thesis) degree option was also mooted by some Senators. Serious concerns were raised at some of the measures suggested in the PGARC report such as, limiting a faculty to take further student if there is prolonged delay in graduation and, exit option from PhD program in science not finding appropriate mention in the report.

As opined on the e-senate portal by the Senators, there was a strong opposition to limiting a faculty to take further student if there is a prolonged delay in graduation. PGARC is required to relook into this issue. The senators expressed concern over the fact that hostel accommodation for degree extended students is a serious problem hence, suggested that there is a need to reduce the delay in PhD graduation as well as MTech students graduating in two years.

It was agreed that PGARC may come up with a framework for MTech thesis and MTech project report options so that departments can adopt each of these options appropriately within a broad framework. The Senate decided that the transcript should explicitly mention whether the student has graduated with thesis or with project report. It was also expressed that degree extended students may be permitted to continue their theses by living in off-campus accommodations.

Many Senators expressed opinion that MTech program should be blended with industry component and should enable industry internship or research thesis being undertaken in industry for a longer duration. It was expressed that MS(R) program should have more project sponsored candidates. For this, two years of project experience requirement should be waived off for MSR program. It was felt that MS(R) program finds less focus in PGARC report. Similarly, PGARC report does not mention about e-Masters program.

Many senators expressed that PGARC has introduced too much documentation requirement for PhD program which should be re-looked into. The Senate also opined that Exit degree option for PhD in Sciences needs serious consideration.

It was suggested that other aspects of PG students' issues such as placement may be included more as suggestion as it does not concern directly with academic program review. It was agreed that PGARC will consider all the suggestions expressed on the floor of the Senate and submit a revised draft within three weeks.

The Senate ended with a vote of thanks to the Chair.

Approved
Sd/-
Prof. Abhay Karandikar
Director & Chairperson Senate
Date: 02.05.2022