

Agenda Items for 31st PGC Meeting, to be held on 9th July 2018

1. Confirmation of the minutes of the 30th meeting of the PGC held on 24th Jan, 2018.

Deferred Items:

2. To discuss the process for nomination of students for Ph.D. program under QUT (suggestions received from Director vide email dated 3rd July 2018, *Annexure II*).
3. To explore the possibility of MS program (with thesis).

New Items:

4. To frame guidelines for students who are coming through rolling admission mode and changing guide at later stage.

5. To discuss about the new course offering from Dr. Sarthok Sircar.

new 4-credit course: Integral Transforms and their Applications. This will be a research level course targeted for all MTech and PhD students and few advanced UG/honors students (with instructor consent).

The course has already been a number within our Mathematics Department (MTH-571). We will have an external visitor (Prof. Tapan Sengupta from IIT Kanpur) come and teach special topics during the period of the course. Details are provided in *Annex IV*.

6. Regular Grade for Thesis/SP for M.Tech. students instead of S/X.

PGC had discussed this in its 30th Meeting and recommended regular grade for Thesis. This point was also discussed in 39th meeting of Senate, where though the Senate had agreed for regular grade, however requested PGC to come with proper mechanism for awarding regular grade to both Thesis and without Thesis options. Specially for Industrial Project (IndP) where the supervisor is from outside Delhi.

7. To discuss the request from M.Tech. 2017 batch students for Industrial Project (IndP).

IndP rule for addition of companies was changed in the last PGC meeting and guideline was informed to students. We are in the process to suggest the new companies to the PGC. In the mean while the existing students of 2017 batch have requested Director for addition of companies to the list. And as the existing list is already applicable to 2017 batch, Director has requested PGC to look into the possibility of adding the requested companies' by the students to the approved company list, which will only be applicable to 2017 batch. The company names are as under:

Sl No.	Company Name	Student No.	Duration	IndP Approved list
1.	Synopsys	7 (ECE) +	May 18 to April 19	No (First time put up)
2.	KPIT	4 (ECE)	Jan 19 to Jun 19	No (Put up but not approved in PGC)
3.	Phillips	1 (CSE)	Jan 19 to Jun 19	No (First time put up)
4.	Accolite	2 (CSE)	May 18 to June 18	No (Approved one time in winter 18 as a special case to accommodate student who have registered)

JD of companies are given in *Annex I*

8. To discuss whether the students likely to complete graduation requirement by 21st December should be allowed to attend the Convocation for photo opportunity due to increase in number.
9. To discuss whether the mandatory requirement for M.Tech. program to complete OOPD and RM should be applicable to Dual Degree and Migrated PhD students(taking M.Tech. on the way)
10. To re-consider the recommendation of the PGC made at its 30th meeting regarding waiver of TA duty.

The Senate at its 39th Meeting considered the recommendations of the PGC and observed/recommended as under for further discussion in the PGC:

“The Senate agreed for grant of waiver for two semesters from TA duty to Ph.D. students who are on institute fellowship for the entire duration. The request for waiver will be considered after doing TA duty for 6 or 7 semesters. The students who are on RA ship are not to be considered for such waiver. The members of PGC, however raised a point that they are looking for a waiver from TA duty at any stage, to which the Senate requested the PGC to reconsider the recommendation and come up with a suitable proposal, as the student who is on Institute Fellowship initially might get shifted to RA ship later.”

11. Addition of course in Data Engineering Specialization bucket.
 - a. CSE542 - Statistical Machine Learning
 - b. CSE556 - Natural Language Processing
12. BoG in its 42nd meeting suggested deliberations at Institute level to evolve recommendations about preferred time duration for Ph.D.
13. To discuss M.Tech. thesis sponsorship by industry
This was mail from Director to discuss the initial guideline (*Annex III*) over mail, however some members including PGC chair suggested it to discuss in PGC.
14. To discuss the SP (SP/CapP/IndP) report format. (will be tabled)
15. To discuss the Timeline for M.Tech. student to move to a specialization from without specialization option.
There is a provision in the PG specific regulation for CSE & ECE to move from General M.Tech. to a specialization with approval of PGC, however the timeline for application is not defined for the same. The relevant provision mentioned in the regulation is as under:
“A student enrolled in a specialization can move to M.Tech.(CSE) at any point by informing suitably.
A student can move from M.Tech.(CSE) to a specialization only if permitted by the PG Committee.”

ECE Company**Synopsys.****Position 1: Branch – VLSI, E&C or any other relevant branches,****Job Description:**

The Embedded Memory Team in Noida is part of Solutions Group and is responsible for embedded memory compiler development. The team here works on all aspects of memory development viz. Bitcell Analysis, Schematic design, Characterization, Design and Compiler verification. Team is working on memory designs at cutting edge technologies and process nodes.

Would be responsible for :

- o Design and develop embedded memory compilers.
- o Learn and apply skills in memory compilers having Transistor level circuit Design.
- o Resolves a wide range of issues in creative ways.

Requirements

- o Strong CMOS fundamentals
- o Knowledge of CMOS fabrication
- o Good digital design knowledge
- o Exposure to basic analog fundamentals
- o Working tcl/ perl scripting know how
- o Basic know how of SRAM, ROM circuits
- o Requires a 0+ years of related experience.
- o Tools: Hsim/ Hspice/ Schematic Capture/ Extraction/ Verilog/Unix

Position 2: Branch – CS, E&C, Embedded or any other relevant branches with inclination towards software development,**Job Description:**

You will be part of a strong development team in the area of System Level Modeling for Architecture exploration and Software Development.

You will develop models for architectural components like Processors, Interconnect & Peripheral models or even complete SoC platforms using C / C++ / SystemC . These models either may be modeled from scratch or will involve integration of models from third party vendors into our tool environment. You will help make customers successful by designing and improving flows of our product, improving software quality and by working closely with customer support.

We offer an international work environment that is characterized by flexibility, an informal atmosphere, a fast pace and an opportunity to impact the way the industry develops new systems and embedded software. You will work with highly professional and motivated colleagues who value and support your contribution. Synopsys is a dynamic international workplace with opportunities for personal and professional growth. The position carries an attractive compensation and benefits package commensurate with a competitive global company.

Requirements

- Essential – Excellent in C/C++
- Highly Desirable – Knowledge of Data Structures & algorithm
- Highly Desirable – Knowledge of computer architecture

- Good to have – Knowledge of SystemC and TLM
- Good to have – Knowledge of Embedded Software

KPIT

Exciting Project Areas...

CS/IT	EC/EI	EE
<ul style="list-style-type: none"> • Fuzzy techniques in Wireless Security • Implementing Security techniques for Automotive Networks • AUTOSAR Basic Software Module Developments –on Calibration, Cryptography, Device Drivers, MCAL • Machine Learning Techniques for Data Driven Modelling • Cybersecurity for Connected Vehicles • AUTOSAR configuration tool development • Chitbot System development using AI techniques 	<ul style="list-style-type: none"> • Model Based Control Design For Vehicle Dynamics Application • Connected Vehicle Simulations • Control Algorithms for ADAS applications • Model Based Calibration For S.I Engine Models • Predictive control design for vehicle stability • Non-linear, Time varying model Development for vehicle simulation • Automotive Telematics Application 	<ul style="list-style-type: none"> • Energy optimization in EV • Battery Modelling • Adaptive Techniques in State of Charge Prediction • Machine Learning Techniques in EV Diagnostics • Estimation Techniques for ADAS Technology • Wireless Power Transfer Technology for Charging • Advanced Motor Controlling Techniques

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Accolite.

Designation: Software Engineer Location: Bangalore/Hyderabad/Delhi/Mumbai. Key Skills: Core Java, Spring, Hibernate, Angular JS & DS/ALGO Education: Full Time Bachelors / Masters degree (Computer Science or Engineering Preferred).

Responsibilities: Involved in all aspects of the development lifecycle. Responsibilities include the ability to: write a very high-quality code that is robust and easy to maintain; Develop software based on agreed designs with little supervision. Involved in building and operating the next generation platforms and large-scale distributed systems. Deliver high-quality platform solutions that support a variety of customer use cases.

Skills Required: Knowledge of production software systems. A solid grounding in Computer Science fundamentals (based on a BE or BTech or MS in CS or related field). The ability to take convert raw requirements into good design while exploring technical feasibility trade-offs. Good understanding of modern programming languages (Core Java, Spring, Hibernate) and open-source technologies (Linux, Oracle/MySQL/MongoDB). Experience in Angular JS would be an added advantage. Excellent in technical communication. Excellent understanding of software development best practices. Accolite covers a broad & deep range of technology stacks including Java, Net, MEAN, Cloud Computing, Data Warehousing, Mobility, Big Data, Data Sciences and AI. Knowledge of these technologies would be an added advantage. Ability to learn and acquire new technologies as needed. Ability to explore and propose new technologies to provide system improvements.

General Skills: Knowledge of service-oriented architectures and an understanding of design for scalability, performance, and reliability. Demonstrated ability to achieve stretch goals in a highly innovative and fast paced environment. Strong desire to build, sense of ownership, urgency, and drive. Excellent written communication and verbal agility are strong assets.

Philips JD

The company is working on projects based on Machine Learning, Natural Language Processing, and Information Retrieval.

Interns are expected to have some experience in these domains along with knowledge of Python programming language.

Application of Machine Learning techniques to answer context specific user queries is an example of the kind of project one would be working on.

----- Forwarded message -----

From: **Pankaj Jalote** <jalote@iiitd.ac.in>

Date: Tue, Jul 3, 2018 at 12:44 PM

Subject: Fwd: Students for the PhD program with QUT

To: Admin PHD <admin-phd@iiitd.ac.in>, PGC Chair <pgc-chair@iiitd.ac.in>, Samaresh Chatterji <samaresh@iiitd.ac.in>, Sheetu Ahuja <sheetu@iiitd.ac.in>, K P Singh <kpsingh@iiitd.ac.in>

PhD Admin:

I think we should now make this a part of our regular academic admin system. Here is what I suggest:

1. Let us evolve a 3-page nomination form for this - one for each of the 3 items. We can take inputs from QUT for it. Please do it in the next day or so, so we can use it for this round also.
2. Let us ask for nominations in April each year for July - target should be students who are finishing 2 semesters here (but not those who are about to finish). So, all students who are in 2nd sem onwards till about 6th sem, can be considered. We should send a reminder to faculty for nominations, as well as to PhD students to work with their adviser if they are interested.
3. Let us add steps for this in the PhD admin/Acad calendar, so it is done every year.

Let us have a defined contact faculty for this program from the PGC, who will work with colleague in QUT for administering it every year. I request PGC to identify who this will be for next year. Then we can put the two contact points together, who can then facilitate it along with PhD admin here.

For this year, let us do it soon so we can have some nominations - I will send to our PhD students also.

Sheetu / KPS: Pls have summary of what we plan to do to be reported in the Senate also.

Regards,

Pankaj

----- Forwarded message -----

From: **Pankaj Jalote** <jalote@iiitd.ac.in>

Date: Tue, Jul 3, 2018 at 12:27 PM

Subject: Students for the PhD program with QUT

To: Faculty Announcements <faculty-notices@iiitd.ac.in>

Cc: PGC Chair <pgc-chair@iiitd.ac.in>, Admin PHD <admin-phd@iiitd.ac.in>, Sheel Nuna <sheel.nuna@qut.edu.au>, Samaresh Chatterji <samaresh@iiitd.ac.in>

Dear Colleagues:

As you know, we have a collaborative PhD program with QUT. Any PhD student at IIIT-Delhi, who has done much of his/her course work can be nominated for this. (The student should have at least 1.5 yrs left to finish.)

I met with QUT's Sheel today to further facilitate this. To make it easier, we suggest:

1. If you are interested in sending a student for this program (who is also interested), please prepare a short nomination for the student which gives: (1) One page summary of students's background, (2) a brief bio of the adviser with a link to the home page, and (3) a one page summary of the proposed thesis problem or problem area. If you know some faculty in QUT who work in that problem/area, please list them also.

2. Please submit this nomination to PhD Admin. PGC will compile and send them to QUT contact person. Our contact person, Dr. Sheel, will facilitate in finding a co-supervisor for the student based on the nomination.

Deadline for nomination for this year is July 15. I have been indicated that QUT will agree to taking more than 2 students also this year, as they have support for it.

This is a wonderful opportunity for our PhD students and all of us. Please make use of it.

Regards,

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Pankaj Jalote
Director and Professor

Industry Sponsored MTech Thesis

One of our stated values is “industry facing”. To enhance our engagement with industry, we can explore “MTech Thesis Sponsorship” program by industry. Contours of the program are:

- A company can sponsor an MTech thesis through a faculty member. In this case, the problem of the thesis will be of interest to the sponsor, and, of course, agreed by the faculty adviser.
- The thesis may (or may not) have a co-guide from the sponsoring company. In this case, the industry co-supervisor will have to be approved.
- The sponsoring company will give a sponsorship to IIT-Delhi, which will be whatever is agreed between the faculty member and the industry, but should not be less than Rs 3 Lac. One-third of this will go as consultancy fee to the supervisor, one-third to the Institute, and one-third to the Department of the supervisor.
- The student will be designated as an RA after one year (i.e. in the 2nd year) to focus on the sponsored thesis work. He will continue getting his/her stipend. He/she may spend parts of his/her time during MTech in the sponsoring organization to work on the thesis. (For any visit and stay, the sponsor will have to cover all expenses, and pay allowance that may be necessary for student to sustain him/her self comfortably.)
- Publications, if any, will follow the standard scholarship norms for authorship.
- If IP is created, both IIT-Delhi and sponsoring company will have full rights to use the work without any constraints. If a patent is to be filed, it will be authored jointly (i.e. the student and his/her advisers will be listed as co-inventors) – for ownership, whatever is mutually agreed by IIT-Delhi and the faculty will be followed.

Process:

- We write to companies about this program (without internal details of sharing etc), and then call them up to explain about this scheme (Summer)
- If they are interested to explore, we should work with them to identify some problem areas of common interest. (Aug)
- We approach relevant faculty, and invite the company to interact with faculty about their problems – they can visit, or we arrange a visit of some faculty, or a skype/webex meeting (Aug)
- Once some faculty member shows interest, then we can move to identifying the MTech student we can have the company involved in this process also. (Oct, Nov – or the time when most MTech students decide on thesis)
- Once a student is also identified, then a small agreement can be signed – this may be like a consultancy contract, so the faculty can give the IP away, if they want.
- DIRD’s office will handle it like a consultancy project with the budget distributed in three parts.
- Upon completion of the project, DIRD/MTech coordinator will get feedback / closure from the company. Upon this, any pending payments can be released.

Table 1			
Course Code	MTH571		
Course Name	Integral Transforms and their Applications		
Credits	4		
Course Offered to	UG/PG students with instructor consent		
Course Description	The course is designed as an introduction to the theory and applications of integral transforms to problems in linear differential equations, and to boundary and initial value problems in partial differential equations. The course assumes very limited knowledge of vector calculus, ordinary differential equations, complex variables contour integration, partial differential equations and continuum mechanics. Many new applications in applied mathematics, physics, chemistry, biology and engineering are included. This course will serve as a reference for advanced study and research in this subject as well as for its applications in the fields of neuroscience, signal processing, informatics and communications. The course is open to all MTech, PhD students and some advanced undergraduates, honors students through instructor consent.		
Pre-requisites			
Pre-requisite (Mandatory)	Pre-requisite (Desirable)	Pre-requisite(other)	
	Basic knowledge in calculus, partial differential equations and complex variables		
Post Conditions*(For suggestions on verbs please refer the second sheet)			
CO1	CO2	CO3	
Students master the techniques of Integral transform and are able to solve integral equations.	Students apply the transform techniques to solve Difference equations, ODEs, PDEs	Students are able to model physical systems involving non-linear DEs.	
Weekly Plan	Lecture		

Week Number	Lecture Topic	COs Met	Assignment/Labs/Tutorial
1	Basic concepts of integral transforms. Fourier transforms: Introduction, basic properties, applications to solutions of ODEs, PDEs.	1,2	
2	Fourier sine and cosine transforms, application to solutions of PDEs, evaluation of definite integrals. Laplace transforms: Introduction, existence criteria	1,2,3	Practice Problems (Set 1)
3	Laplace transforms: Convolution, differentiation, integration, inverse transform, Tauberian Theorems, Watson's Lemma, solutions to ODEs, PDEs (IVP, BVP).	1,2	Practice Problems (Set 2)
4	Applications of joint Fourier-Laplace transform, definite integrals, summation of infinite series, transfer functions, impulse response function of linear systems.	1,2	Practice Problems (Set 3)
5	Hankel Transforms: Intro, properties and applications to PDEs Mellin transforms: Intro, properties, applications; Generalized Mellin transforms.	1,2,3	Practice Problems (Set 4)
6	Hilbert Transforms: Intro, definition, basic properties, Hilbert transforms in complex plane, applications; asymptotic expansions of 1-sided Hilbert transforms.	1,2	Practice Problems (Set 5)
7	Stieltjes Transform: definition, properties, applications, inversion theorems, properties of generalized Stieltjes transform. Legendre transforms: Intro, definition, properties, applications.	1,2	Practice Problems (Set 6)
8	Z Transforms: Intro, definition, properties; dynamic linear system and impulse response, inverse Z transforms, summation of infinite series, applications to finite diff. eqns.	1,2,3	Practice Problems (Set 7)
9	Radon transforms: Intro, properties, derivatives, convolution theorem, applications, inverse radon transform	1,2	Practice Problems (Set 8)
10	Fractional Calculus and its applications: Intro, fractional derivatives, integrals, laplace transform of fractional integrals & derivatives,	1,2	Practice Problems (Set 9)
11	Integral transforms in fractional equations: fractional ODEs, integral equations, IVPs for fractional DEs, fractional PDEs, green's function for fractional Des	1,2	Practice Problems (Set 10)

	12	Additional problem solving sessions	1,3	Practice Problems (Set 11)
	13	Some additional topics (Prof. Tapan Sengupta): Orr-sommerfeld equation, POD	1,2,3	Practice Problems (Set 12)
Weekly Lab Plan				
			COs Met	Platform (Hardware/Software)
Week Number	Laboratory Exercise			
*Please insert more rows if required				
Assessment Plan				
Type of Evaluation	% Contribution in Grade			
Quizzes/Assignments	30			
Midsem	30			
Endsem	40			
*Please insert more row for other type of Evaluation				
Resource Material				
Type	Title			
Textbook	1) Advanced topics in Applied Mathematics by S. Nair 2) Intro. To Applied Mathematics, G. Strang			
Reference	1) Fractional calculus, Oldham and Spanier 2) Handbook of mathematical fuctions, M. Abramowitz & I. Stegun			