

## PROPOSAL FOR ADVANCED INSTRUCTIONAL SCHOOL.

Date : **From 2nd December to 14<sup>th</sup> December 2019.**

Topic / Title of the programme : Advanced Commutative Algebra

Full address of the venue :

Department of Mathematics

**Indian Institute of Technology Kharagpur**

West Bengal-721302

Names of the two organizers (with full address, position and affiliation) :

- 1) Prof. Mousumi Mandal.  
IIT Kharagpur  
Email : mousumi@maths.iitkgp.ac.in  
Tel. No. 03222283658
- 2) Prof. Ramakrishna Nanduri  
IIT Kharagpur  
Email : nanduri@maths.iitkgp.ac.in  
Tel. No. 03222282886
- 3) Prof Manoj Kummini  
Chennai Mathematical Institute  
email: [mkummini@cmi.ac.in](mailto:mkummini@cmi.ac.in)  
Tel. No. 044-7196 1043

Email address to which soft copy of the applications can be sent : [nanduri@maths.iitkgp.ac.in](mailto:nanduri@maths.iitkgp.ac.in)

Postal address to which hard copy of the applications can be sent : Dr. Ramakrishna Nanduri,  
Assistant Professor, Department of Mathematics  
IIT Kharagpur, West Bengal-721302

Last date for receiving the online applications : **15<sup>th</sup> June 2019**

Brief description about the school for publicity : (About 200 words): This school covers topics in an advanced course in commutative algebra. Topics to be discussed include: flatness, criterion for flatness, fibres of flat maps, generic flatness theorem; Kahler differentials, fundamental exact sequences; completion; smoothness; jacobian criterion; Cohen structure theorem (equicharacteristic case); excellent rings; Lichtenbaum-Schlessinger functors. The prerequisite for this school is a course in introductory commutative algebra (associated primes and primary decomposition; integral extensions; dimension theory of noetherian local rings).

### **Budget:**

		<b>Number of lectures</b>	<b>Rate/hour</b>	<b>Total Rs.</b>
<b>Honorarium</b>	Speakers	24X 1.5 hours	Rs.1500/- per hour  total Rs: 54000	1,46,000
	Tutors	24 hours	Rs. 750/- per hour per person. Normally, 2 course associates + one speaker conduct the tutorial session.  total Rs: 54000	
	Organizers	2	Rs.10000/- for the 1 <sup>st</sup> week and thereafter Rs. 500 per working day (after the first week) subject to physical presence of the organisers at the venue  total Rs: 26000	
	Support staff	12. working days )	Rs. 1000/- per working day irrespective of the total number of staff.  total Rs: 12000	
<b>Accommodation :</b>	The NCM programmes are intended for dissemination of mathematical knowledge and therefore the organisers are advised to request to the host institute to give <b>free accommodation</b> to the resource persons and participants.			

	Speakers & Tutors : Rs.1800 X 7 rooms X 8 days			1,00,800	
	Participants : Rs.200 X 30 persons X 15 days			90,000	1,90,800
<b>Travel</b>	Taxi/Train	7 (speakers+tutors)	Rs. 7,000 per person	49,000	
	Speakers (air fare)	3	Rs. 14,000.per person	42,000	91,000
<b>Food</b>	Breakfast	For 34 persons for 15 days	Rs. 120 per person (speakers) Rs. 60 per person (participants)	34,200	
	Lunch	For 34 persons for 15 days + 10 persons for 12 days	Rs. 200 per person.	1,26,000	
	Tea and Snacks	For 44 persons for 12days	Rs. 75 per person per day.	39,600	
	Dinner	For 34 persons for 15 days	Rs. 150 per person (speakers) Rs. 75 per person (participants)	42,750	
<b>Miscellaneous</b>					10,000
<b>Total</b>					<b>6,80,350</b>

**Syllabus: (Each speaker is required to deliver minimum 6 lectures).**

<b>Name of the Speaker with affiliation</b>	<b>No. of Lectures</b>	<b>Detailed Syllabus</b>
Prof Mrinal Das ISI Kolkata	6	Flatness, going down theorem, local criterion for flatness, fibres of flat maps,, generic flatness theorem
<b>Prof Sarang Sane IIT-Madras</b>	6	Derivations, Module of Kahler differentials, fundamental exact sequences, relation to conormal modules, completions and complete rings
Prof Suresh Nayak ISI Bengaluru	6	Formal smoothness and smoothness, separable field extensions, Cohen structure theorem (equichar. Case) jacobian criterion, relation to flatness and Kahler differentials
Prof Manoj Kummini CMI	6	Excellent rings; Lichtenbaum-Schlessinger functors.

**References:**

1. Matsumura, Commutative Algebra
2. Eisenbud, Commutative algebra with a view towards algebraic geometry
3. Hartshorne, Algebraic geometry
4. Hartshorne, Deformation theory.

(Lecture notes from the speakers, if available)

**Time-Table (with names of speakers and course associates/tutors):**

Day	Date	Lecture 1 (9.30–11.00)	Tea (11.05 – 11.25)	Lecture 2 (11.30–1.00)	Lunch (1.05–2.25)	Tutorial (2.30–3.30)	Tea (3.35-3.55)	Tutorial (4.00-5.00)	Snacks 5.05-5.30
		(name of the speaker)		(name of the speaker)		(name of the speaker + tutors)		(name of the speaker + tutors)	
Mon	2/12/2019	MD		SS		MD+2		SS+2	
Tues	3/12/19	MD		SS		MD+2		SS+2	
Wed	4/12/19	MD		SS		MD+2		SS+2	
Thu	5/12/19	MD		SS		MD+2		SS+2	
Fri	6/12/19	MD		SS		MD+2		SS+2	
Sat	7/12/19	MD		SS		MD+2		SS+2	
SUNDAY : OFF									
Mon	9/12/19	SN		MK		SN+2		MK+2	
Tues	10/12/19	SN		MK		SN+2		MK+2	
Wed	11/12/19	SN		MK		SN+2		MK+2	
Thu	12/12/19	SN		MK		SN+2		MK+2	
Fri	13/12/19	SN		MK		SN+2		MK+2	
Sat	14/12/19	SN		MK		SN+2		MK+2	

MD: Mrinal Das; SS: Sarang Sane; SN: Suresh Nayak; MK: Manoj Kummini

**Tutorial Assistants:**

S. No.	Name	Affiliation
1	Ramakrishna Nanduri	IIT Kharagpur
2	TBD	
3	TBD	
4	TBD	

**Account details for Electronic Fund Transfer to the host institute's bank account :**

- Name of the bank : Syndicate Bank
- Bank's branch address : SRIC, IIT Kharagpur
- Bank A/c. No. : 95562200002955
- Type of account: savings
- IFSC code : SYNB0009556
- MICR code :721025103
- Account holder : Dean, CE, IIT Kharagpur
- PAN: AAAJI0323G

**Please note the following points while preparing the budget :**

- Each speaker is supposed to deliver at least 6 lectures and conduct 2 tutorials of two hours each.
- As per the Government rules, economy air fare only by Air India can be reimbursed.
- There is no provision for reimbursement of travel fare to the international speakers.
- No travel grant can be given to the speakers for conference part of the workshop.
- There is no provision for reimbursement of travel expenses to the guest speakers.
- There is no provision for reimbursement of travel expenses to the participants.
- Only lunch, tea/snack will be provided to the local participants and there is no provision for their breakfast and dinner. However, the outstation participants will be provided with all the local hospitalities.
- No provision for the cost of pen, notebooks, photocopy, etc. All the participants are requested to bring their own notebooks, pens, etc.