

Academic Structure of a PTMT Camp

The following are arrived at after extensive soul-searching by me, pondering over the PTMT camp just concluded at Pune, brain-storming discussions with Jayanthan A.J., and V.M. Sholapurkar, and most importantly the feedback from the participants.

1. The PTMT camps will be planned at least 6 months in advance. (MTTS camps are decided almost a year in advance!) The details of a PTMT camp, such as the venue, the period, and the the theme will be announced on MTTS site <http://mtts.org.in/ptmt> about 6 months in advance. The application forms will be available in .doc or in .odt format. The application will ask for the complete contact details such as the mobile number, residence number, email-id etc.

In fact, we may accept only on-line application. The computer will have all the data and the typing errors of names etc. are minimized.

2. Requests for regional workshops, rather than, national workshops are welcome. Preference will be given to those institutes who can find some partial support for the workshop from local resources.
3. The selection process will be done by about 10 weeks before the start of the camp. The selected candidates will be informed via email immediately. The list will also be displayed on the mtts site. The applicants should periodically check the website for information. Those who are selected should not wait for the arrival of their selection letter by post. If they wish to participate, they should book their tickets, start the process of applying for leave from their college etc.
4. The camps will be of 2 weeks duration, a Monday to 2nd Friday (11 working days). The programme will end only at about 5 PM on the 2nd Friday.
5. Each camp will concentrate on a Single subject, such as Real Analysis, Linear Algebra, Several Variable Calculus etc.
6. One of our principles is: "People learn by observation, then by mimicking, imitation and emulation and finally adaptation". To infuse some good practices of teaching, MTTS faculty should teach for the first few days. Give the participants a chance to observe and adapt some of the 'tricks'.

To achieve this, during the first week, there will be interactive sessions by a few experienced MTTS faculty. As the participants would have already gone through the subject, we do not have to follow a "linear model". There will be 3 parallel sessions on the chosen theme.

Examples:

- (a) Real analysis.

Parallel Sessions: Sequences and their convergence; Continuity; Differentiation; Integration; Uniform convergence.

- (b) Linear Algebra.

Parallel Sessions: Linear dependence and independence; Linear Transformations; inner product spaces (including Gram-Schmidt, orthogonal maps and classification of orthogonal maps of \mathbb{R}^2 , the Euclidean plane); Eigen values and diagonalization.

- (c) Several Variable Calculus.

Parallel Sessions: Geometry and topology of \mathbb{R}^n , the n -dimensional Euclidean spaces; Basic Differentiation including mean value theorems, partial derivatives, and derivatives of higher order; Problems of Maxima/Minima, constrained Maxima/minima; Inverse and implicit function theorems; Line integrals and Green's theorems.

7. The aims of each of the parallel sessions will be
 - To indicate the “best ways” to introduce the definitions, motivate the results, outline the strategy of the proof, and how to arrive at a rigorous proof following the strategy.
 - To give a list of examples which should illustrate the concepts, which are typical and which make the participants to foresee/guess/conjecture the results.
 - To give ‘standard’ applications in Mathematics and elsewhere (whenever possible).
 - To point out the subtle points of the proof, concepts etc.
 - To point out the common “misconceptions”.
 - To provide (IF POSSIBLE) a model lesson-plan for the use of participants back home.

8. The resource people will prepare a list of about 30-40 topics for seminars by the participants.
 - The topics will be intimately related to the theme of the workshop, not fancy ones.
 - The guiding principles in the choice of the topics will be (i) their supportive role to consolidate and enhance the understanding of the regular sessions by the resource people, (ii) extensions of the result of the regular sessions and (iii) those which may not be done in a typical course due to the constraint of time but which offer a deeper insight to the subject.
 - The list will have proper references so that the participants will be able to prepare from them. The references could be to books or to articles of mine that could be downloaded from the mttts website.
 - The list will be sent to the participants along with the letter of invitation. Each of them should select 3–4 topics which they would like to lecture on. Their preferences should be communicated to the Coordinator when they send their letter of acceptance.
 - As it is likely that more than one might have opted for the same topic, they may be encouraged to discuss together and make a presentation. Care should be taken that each participant gives a seminar.

9. Though I emphasized the importance of ‘reviewing’ the material taught and learnt, the participants did not practice this. To remedy this and also to encourage them to write Mathematics on their own (rather than ‘remembering what learnt from a text-book), it is suggested that they are given a writing assignment every day. These assignments will be submitted the next day morning. The faculty will go through them, comment on them and offer suggestions for improvement.

10. As is done in MTTTS, to encourage the trick of “Learn through discussion with peers”, we may earmark one hour daily in the first week for group discussions. Many teachers are shy or diffident to discuss their difficulties with their colleagues. Hopefully the feature of group discussion will make them more open.

11. At the end of the camp, each and every participant who has worked diligently during the camp, should leave with the conviction of having mastered the subject in depth and with the confidence of being able to teach the subject well in his college.