

## Two-Week Compact Course for M.Sc / M.A./ M.S. Students in Mathematics

### A Program of Ramanujan Mathematical Society

*Ramanujan Mathematical Society has planned 'Compact Courses for postgraduate students in mathematics' to collaborate with universities / institutions to teach the students and guide their teachers in some topics in which they do not have an expert faculty. The panel of resource persons for the CC contains some of finest mathematicians and devoted teachers.*

**Preamble:** Since many decades, there has been an acute shortage of teachers to teach many topics in Indian Universities, mainly because not enough teachers are appointed or available. The situation is far more acute in mathematics because of migration to professional courses of students (with ability to learn good mathematics), who otherwise could have become teachers and researchers. The result is that there are specialists in only a few topics in any institution and none in many important topics which require teaching. Ramanujan Mathematical Society desires to take an initiative to organize a number of compact courses, each of two weeks duration, in which the M.Sc. / MA / M.S. (in short M.Sc., in what follows) students in universities and colleges get an opportunity to learn the intricacies of good mathematics from experienced researchers who are dedicated to teaching. This will help the students to learn deeply some topics in which their teachers are not specialized.

**Compact course:** One of the simplest and least expensive activity will be to help mathematics departments in universities and Post-graduate colleges to organize a 2-week compact course on various topics. The aim should be to choose a topic and organize a program of teaching M.Sc. students a substantial / main part of the syllabus of the topic by experts in two weeks.

In order that a topic in a semester course be covered reasonably well, it is necessary that the lectures be organized on Saturdays also. Problem-solving is an important part of the course. The M. Sc. students have to be made free for these two weeks for a total of 3 hours every day. The course can be a partial substitute for their regular one semester course on a topic and one local teacher will have to continue further so that the students will be prepared as they would be in a regular course work of 3 to 4 months.

**Faculty, Associate Faculty and Tutors of a compact course:** RMS will arrange one or two faculty, who will be experienced researchers with love for teaching at M.Sc. level or one such mathematician (called main faculty) and one associate faculty / tutor in each week in the 2-week compact course, one teaching in the morning and another in the afternoon. Each class will be of 1 and 1/2 hours duration. There can be one set of two experts in the first week and another set in the second week, if it becomes necessary due to time constraints.

The main faculty (or the two main faculties) will always be appointed by RMS. The associate faculty, who will join the main faculty, will be a faculty of the institute where the CC is conducted or a PDF / Senior Research Scholar. The appointment of an associate faculty / tutor will always be on the choice of the main faculty. They will help the main faculty in different ways like in conducting tutorials, problem-solving sessions, preparing a question bank and answers for the tutorials etc.

Local teachers / PDFs / Research Scholars should be encouraged to attend all lectures and tutorials / problem solving sessions. But they will not be counted as associate for the course, unless the main faculty chooses one of them. The choice of the associate is left entirely to the main faculty, who is appointed by RMS.

**Role of RMS:** RMS will identify faculty for the workshop in a topic chosen by an institution for the compact course and will pay travelling allowances, honorarium and some contingency to the faculty based on the financial commitment made by the institution where CC is arranged.

**Honorarium to the faculty:**

1. Main faculty in a compact course = Rs. 10,000 per week.
2. A faculty of the institution where CC takes place or PDF as an associate faculty = Rs. 5,000 per week. The honorarium to an associate faculty of the institution will be paid by RMS only if a grant for the programme is received by RMS from a funding agency.
3. Senior Research Scholar as a tutor = Rs. 3,000 per week.

**Local hospitality:**

The university or the college will bear the cost of local hospitality (guest house accommodation, food bill and local transport etc.). However, there may be a genuine difficulty in meeting the local hospitality on the part of the university or the college, in which case RMS will pay actual cost for the local hospitality subject to a maximum of Rs. 30,000. This would become possible for RMS only after it receives grants from funding agencies.

**Transport expenses of the faculty / associate Faculty / tutor:** Air travel and travel by taxi is permitted for all faculties, following the norm of the funding agency.

**Funding:** Mathematics departments desirous of holding a compact course under the compact course program of RMS, may apply to RMS (using the form CC-2) for organizing the course. The host departments/institutions will be divided into three categories:

**Category C1.** Departments that can meet the full expenses of the CC or apply to funding agencies directly and get this compact course program sanctioned to their departments. The total cost of organizing a two week CC is about Rs. 70,000. But the total cost may even be less.

**Category C2.** Departments that can support this program to the tune of Rs. 40,000/- from funds of the department like SAP, projects etc.

**Category C3.** Departments that fully depend on government funds sanctioned to RMS for this purpose.

Naturally, RMS will offer its preference to departments in categories 1 and 2 and then to departments in Category C3.

**Schedule/ Adjustment of the compact course in a semester system:** Due to semester system and continuous assessment pattern, all colleges and universities conduct periodical tests. So asking the department to have 2 week free time (3 hours a day for 2 weeks) may not seem to be practical. To some extent this may appear to be a problem.

The topic of a compact course will have to one, which will be taught during the semester. The departments wishing to organise a compact course will need to adjust either by advancing or delaying the assessment in other topics by a period of two weeks. After the compact course, less than normal number of lectures on the topic need to be given and students will be more free to attend larger number of lectures and assessments in other topics after the compact course. The concerned local professor is duty-bound to continue the classes so that students are fully prepared for examination in the topic of course as mentioned earlier in this document. It is suggested that the compact course be arranged in the beginning of a semester.

However, if a department desires, a compact course can be arranged during the semester-breaks just before the semester in which the topic of the compact course will be taught.

This can be done if it is possible for **almost all** students to be available for the compact course.

**Participants:** Along with a minimum of 20 students of the host and neighboring institutions, there should be at least 2 teachers, who are likely to teach the topic of the workshop to M.Sc. students. Such teachers are also expected to attend these lectures.

**Role of the participant teachers teaching the course:** They will evaluate the students through a written or oral examination one week after the completion of the course. Approval of the question paper for this evaluation has to be taken from the main faculty.

**Selection of faculty of the course:** The department, which desires to organize such a course for its students and participant teachers, should choose the topic of the course. It will be the responsibility of RMS to select suitable expert faculty after contacting them.

**Advantage:**

- (i) The students attending the course will attend the lectures of an expert in the subject. This will be a rare experience both for the teachers and students in a large number of institutions in India.
- (ii) Almost all students will be quite serious in learning the material in the course, since this will be a part of their course and they will be evaluated on the material taught in the course. This is not so in most of the workshops – only a few take the lectures seriously.
- (iii) The CC can also be a training ground for young mathematicians who will work as associate faculty / tutor in teaching and deeper learning of a topic.

**Compact Course at a private university and colleges:** Many private institutions are aiming towards excellence in teaching mathematics at M.Sc. level. RMS will be happy to help them, provided they wish to meet all expenses of a CC. The total cost of organizing a two week CC is about Rs. 70,000

**Method of Application:** Departments desiring to conduct a CC may apply in the format given in CC-2.