## MINUTES OF THE THIRD MEETING OF BOARD OF STUDIES OF SCHOOL OF

 MATHEMATICS, HELD ON $24^{\text {TH }}$ OF FEBRUARY, 2012 IN ROOM NO. D 108
## PRESENT

1. Prof. V. K. Bhat Director, School of Mathematics
2. Prof. A. P. Singh, Professor and Head, Department of Mathematics, Central University of Rajasthan.
3. Prof B. S. Komal (Retired Professor)

Department of Mathematics, University of Nammu
4. Dr. Suparn Sharma Expert Member
Assistant Professor, SOBE
5. Dr. A.K.Das, Assistant Professor, SOM
6. Dr. Sharda Putukuchi
(Representing Director, SBT)
Asst. Prof., SBT
SMVD University
7. Dr. Ajay Sharma

Member \& Convener

Lecturer, SOM
8. Dr. Kuldip Raj Member Lecturer, SOM
9. Dr. Sandeep Bhougal .. Member

Lecturer, SOM
10. Dr. Rakesh Kumar

Member Lecturer, SOM
11. Dr. Sandeep Sharma Assistant Professor, SOM
12. Mr. Surender Singh
Assistant Professor, SOM

### 1.1 Welcome and Introduction

The Chairman of the Board welcomed all the members to the third meeting of Board of Studies and thanked Prof. A.P. Singh \& Prof. B. S. Komal for visiting the University in spite of their busy schedule to attend the meeting. He introduced faculty namely Dr. Sandeep Sharma \& Mr. Surender Singh who have joined as Assistant Professors in the School. He then started the proceedings of the meeting.

### 1.2 Confirmation of the minutes of the $2^{\text {nd }} \mathrm{BOS}$

The Board confirmed the minutes of the $2^{\text {nd }}$ meeting of the Board of Studies held on 2 gh April, 2011.

### 1.3 Action Taken Report

Director SOM informed the members that courses approved in the $2^{\text {nd }}$ meeting of the Board of Studies held on $28^{\text {th }}$ April, 2011 stand approved by academic Council in the $16^{\text {th }}$ meeting held on 20.10 .2011 . He also informed the members that the courses shall be offered from the next academic session.

## The Board noted the reported position.

### 1.4 Review of Academic Activities

Dr A. K. Das convener gave a presentation about the academic activities of the school. A brief review is given here under:
(a) Admission:

## Details of Admission

| S.No. | Programme | Academic Session | No. of students <br> Admitted |
| :--- | :--- | :--- | :--- |
| 1 | M. Sc. Mathematics | $2011-2013$ | 18 |
| 2 | Ph. D | - | 03 |

Total number of students in the Ph. D Programme is 13.
Two faculty members have recently joined as Assistant Professors in the school. In addition to this 22 alumni of the school have been selected recently for the post of Statistical Assistants in Planning Department of J\&K Government.

## (b) Teaching

School of Mathematics offers courses in Applied Mathematics to different streams of B.Tech (Computer Science \& Engineering, Electronics \& Communication Engineering, Mechanical Engineering, \& Industrial Biotechnology).

School of Mathematics has a two year full time M.Sc (Mathematics) Program. The courses are interdisciplinary. In addition to courses from pure Mathematics, the program includes courses from Theoretical Computer Science, Operational Research, Economics and a minor project.
This structure was appreciated by the Expert Members for its being interdisciplinary and application oriented.

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Apart from teaching to B.Tech. \& M.Sc. students, the School offers ten different papers for Ph.D. course work.

The School has library supported by NBHM (National Board for Higher Mathematics and books are issued to students and research scholars.
The School has a Computer Lab. related to the Lab. Work of M.Sc. Mathematics programme.
(c) Publications by Faculty:

## i. Research Papers

All faculty members are actively involved in research work. Total number of research papers published in National \& International Journals is about 200. Faculty members regularly attend conferences, seminars and workshops at National \& International level. The faculty members have guided four research scholars for PhD and thirteen. more research scholars are registered in the school at present.

## ii. Books

1. Prof. V. K. Beat: An Introduction to real analysis; Narosa Publishing House, ISBN: 978-81-8487-149-4, 250 pages, 2011.
International Edition by Alpha Science International Limited, Oxford, U.K., OX4 2JZ, ISBN 978-1-84265-705-8, 2012.
2. Dr. Kuldip Raj: Substitution Operators on Some Function Spaces, Lambert Academic Publishing (Germany), ISBN: 3838398432, 2010.
(d) Research Projects / Grants

The school has four Research Projects. The details are as under:

1) PR-29 - Annual Grant for library from NBHM, DAE, Government of India (GOI)
2) PR-40 (PI-Dr. Ajay Sharma) Composition Operators and Dynamics Valued functions. NBHM, DAE, Government of India.
3) PR-46 (PI- Dr. V. K. Bhat) 'Transparency of Skew Polynomial Rings over Noetherian Rings.' NBHM, DAE, Government of India.
4) PR-50 (PI- Dr. V. K. Bhat) 'Associated Prime ideals \& minimal Prime Ideals of Skew Polynomial Rings' UGC.
5) Dr. Kuldip Raj 'Sequence Spaces and Composition Operators'. (Submitted to NBHM)
6) Dr. Rakesh kumar 'Modeling Disaster management using Operations research Technique with special reference to Jammu \& Kashmir'. (Submitted to DST)

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Student Faculty Committee Meetings: To discuss the matters of students pertaining to teaching and problems (if any) regular SFC meetings are held. The committee includes faculty members and student representatives from the school. For the current semester the matters concerning book recommendation for Central library, School Library, course coverage, attendance and conduct of seminar etc were discussed in the SFC meetings held on 24.08.2011, 3.10.2011 and 10.01.2012.

Weekly faculty meetings: To discuss the routine matters of the school with respect to teaching, research, conduct of exams, procurement of books and journals, purchase of equipment, requisitions for furniture, submission of reports etc. regular weekly faculty meetings are held. During 2011 these meetings were held on every Wednesday at 12 Noon (working day). These meetings are held without any notice and time table is finalized in such a way that all faculty members are present. During this time students go to get the books issued from the school library.

## (f) Other Activities

## 1. Student Seminar

The school conducts a weekly Student Seminar attended by all M.Sc (Mathematics) students, Research Scholars \& Faculty members. In this seminar one research scholar and one student from M.Sc. speak on a topic suggested by course coordinators. The topics are application oriented.

## 2. Guest Lectures

The school also organizes Guest Lectures by Mathematicians from other Universities for students \& Research Scholars. Prominent among those who visited the school during 2011 and delivered guest lectures include:
(i) Prof. A. P. Singh, HOD, Mathematics, Central University of Rajasthan, April 28, 2011 (Delivered a lecture on Cauchy's Theorem and related
notions).
(ii) Prof. A. P. Singh, HOD, Mathematics, Central University of Rajasthan, October 24-25, 2011 (Delivered a lecture on Some recent developments in Complex Dynamics).
Prof. M. Mursaleen Professor, Aligarh Muslim University, February 23, 2012 (Delivered a lecture on Sequence Spaces).

The Board noted the reported position and all members of the Board including Expert Members expressed satisfaction on the progress made by the school in terms of course development, teaching, research \& other related activities.

### 1.5 Reporting Items:

## Proposal of XII Plan 2012-2017 to be submitted to UGC

The plan has been discussed in faculty Meeting of School of Mathematics and finalized on 22.02.2012. Detailed plan attached at Annexure-I (10 pages)

The details of itemwise plan are as under:-

### 1.5.1 Plan for Financial Year 2012-13

## Renovation work of the school:

The faculty cabins of the school are like those in a bank and are not suitable for good academic atmosphere. The cabins are not up to the level of ceiling, but half of it. Due to the present structure of cabins privacy and research activities of individual faculty members is affected. To provide a better academic environment faculty cabins need renovation.
School of Mathematics has 13 research scholars at present but proper furniture and sitting arrangements are not available. A separate arrangement needs to be created in the school which includes creation of cubicles.
Apart from these, office, laboratory, tutorial rooms in the school of Mathematics needs renovation. Total non-recurring expected expenditure for this work would be Rs 25 lacs.

## Procurement of Furniture:

Towards the procurement of furniture for conference room, office, faculty and research scholars a grant of Rs. 20 lacs are requested. No proper furniture is available (particularly in conference room, office and research scholars' rooms). The items round table, tables, office chairs, visiting chairs, sofa, centre tables, almirahs, book cases, white boards, black/green boards, notice boards etc.

## Maintenance of infrastructure:

Towards the maintenance of the infrastructure of the school like laboratory, library, offices etc. a grant of Rs 5 lacs is required.

The Board approved the renovation work of the school, procurement of furniture and maintenance of infrastructure.

### 1.5.2 Plan for Financial Year 2013-14

## Setting up of Research Centre in Mathematical Sciences:

Presently School offers PhD Programme in areas of Algebra, Topology, Functional analysis, Complex analysis, Queuing theory and Sampling Theory. To augment research activity in some areas such as Computational Fluid Dynamics, Numerical Analysis, Theory of Elasticity, Information Theory, Coding theory etc., the school would like to setup a research centre which consists of a Computational Mathematics and Mathematical Modeling laboratory. This lab will be equipped with software GAP (for algorithms in group theory), MAGMA (for algorithms in Algebra and Number Theory), MAPLE (for programming related to theory of elasticity), MATLAB (for interdisciplinary research work), SPSS (for

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analysis of statistical data), MINITAB, LINGO (for research in operations research), DATAPLORE (for signal processing), ANYDOC (to study algorithms of document classification). This lab will also have 2 servers, desktops and some physical models to visualize the mathematical concepts. Approximate cost to create the centre is Rs 30 Lass (including maintenance).
The Board approved the setting up of Research Centre in Mathematical Sciences.

### 1.5.3 Plan for Financial Year 2014-15

Introduction of specializations in M.Sc. Mathematics Programme:
In 2014-15, School of Mathematics is planning to introduce specialization in M.Sc. Mathematics programmes like (Pure Mathematics, Operations Research/Statistics and Applied Mathematics).This would help in conduct of teaching (interdisciplinary in nature). This would lead to interdisciplinary research and collaborative work with people from other disciplines like Bio sciences, other physical sciences, management and humanities etc. For this the following faculty, staff and infrastructure are required.
Additional requirement:
a. Faculty \& staff

| S.No | Name of the post with Pay <br> scale \& Grade Pay | No. <br> of <br> post |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 1 | Assistant Professor <br> $(15600-39100)$, GP- 6000 <br> y Gross <br> Pay | 4 | $32916 /-$ | Yearly <br> Gross <br> Pay | Total Gross <br> pay as per <br> requirement <br> of posts <br> (Rs.) | Remarks |
| 2 | Technical Assistant (TA) <br> $(9300-34800)$ GP- 4200 | 2 | $21938 /-$ | $1576968 /-$ |  |  |
| 3 | Lab. Assistant (LA) <br> $(5200-20200)$ GP- 4200 | 3 | $18752 /-$ | $225024 /-$ | $675072 /-$ | $526512 /-$ |
| 4 | Library Assistant <br> $(5200-20200) ~ G P-2800$ | 1 | $18752 /-$ | $225024 /-$ | $225024 /-$ |  |
| 5 | Lab./Library Attendant <br> $(4400-7440)$ GP- 1300 | 2 | $8969 /-$ | $107628 /-$ | $215256 /-$ |  |
|  | Total | $\mathbf{1 2}$ |  |  | $3221832 /-$ |  |

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* The above calculations are based on monthly pay details communicated by the Finance wing of SMVDU.
b. Infrastructure: In order to conduct teaching and research in different areas of Mathematical Science (Pure Mathematics, Applied Mathematics, Operations Research, Statistics, Theoretical Computer Science) the school requires a building. The details of the requirement are as under:

| S.No. | Room Type | Required <br> Number | Approximate Area <br> (Sq. Ft.) |
| :--- | :--- | :--- | :--- |
| 1. | Lecture Halls (36 x 24 sq. ft) | 6 | 5184 |
| 2 | Tutorial Rooms (24 x 18 sq. ft) | 6 | 2592 |
| 3 | Lab (36x24 sq. ft) | 6 | 5184 |
| 4 | Library (with office/ reading room-36 x 36 sq. <br> $\mathrm{ft})$ | 1 | 1296 |
| 5 | Faculty rooms (15 x 12 sq. ft) | 20 | 3600 |
| 6 | Research Scholars rooms (24 x 18 sq. ft) | 3 | 1296 |
| 7 | Dean / Director rooms (with wash room) (24 <br> x 21 sq. ft) | 2 | 1008 |
| 8 | Office rooms (24 x 18 sq. ft) | 2 | 864 |
| 9 | Conference Room (with wash room) (24 x 21 <br> sq. ft) | 2 | 1008 |
| 10 | Seminar room (48 x 36 sq. ft. | 2 | 3456 |
| 11 | Store (24 x 18 sq. ft) | 2 | 864 |
| 12 | Rest room for Girls (24 x 18 sq. ft) | 1 | 432 |
| 13 | Rest room for Boys (24 x 18 sq. ft) | 1 | 432 |
| 14 | Wash rooms/Toilets (Girls | 3 | 1512 |
| 15 | Wash rooms/Toilets (Boys | 3 | 1512 |
| 16 | Wash rooms/Toilets (for <br> challenged) | 2 | 800 |
| 17 | Physically | 2 | 336 |
| 18 | Corridors | 1 | 3624 |
|  | Total | - | 35000 |
|  | ra |  |  |

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\begin{array}{ll}
\text { Cost }=35000 \times 1900 \text { per st. } & =665.0 \text { lass } \\
\text { Furniture }(10 \% \text { of above cost }) & =66.5 \text { lacs } \\
\text { Grand Total } & =731.5 \text { lacs }
\end{array}
$$

*The rates for the above details has been communicated by the Engineering wing of the university

The Board approved introduction of specializations in M.Sc. Mathematics Programme, additional requirement of faculty\&.staff and infrastructure.
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### 1.5.4 Plan for Financial Year 2015-16

## Procurement of Furniture for School Library:

School has a library which is partially funded by NBHM (National Board of Higher Mathematics). By the year 2015, the number of books and volumes of journals in the library is expected to be around 5000 . Towards the maintenance of these books furniture items like book cases, racks, tables, chairs and other related items shall be required. Furthermore some computers for the maintenance of up to date records and accession would be required. Towards this a grant of Rs. 15 lacs is required.

## The Board approved the Procurement of Furniture for School library.

### 1.5.5 Plan for Financial Year 2016-17

## Up gradation of Lab.:

The machines and software at present in computer lab would become old and out dated by 2016-17. Therefore, towards the up gradation of the labs. a grant of Rs. 20 lacs is required. External expert members Prof. A. P. Singh and Prof. B. S. Komal were of the view that for up gradation of lab. Rs. 20 lacs would not be sufficient enough. Director, School of Mathematics and other faculty members of school made it clear that the machines have been procured recently and only some machine \& software would be required for up gradation. External members were satisfied with the clarification.
The Board then approved the up gradation of Lab.

### 1.5.6 Recurring Expenditure of the school (for 2012-2017):

## I. Library:

School of Mathematics has its own Library which is partially funded by National Board for Higher Mathematics.
Procurement of books will be for areas like Algebra, Analysis, Differential Equations, Topology, Operations Research, Bio-Mathematics, Statistics, Coding information \& Theory, Geometry, Mathematics for chemists etc.

Journals in the following areas will be procured.
Algebra, Analysis, Differential Equations, Topology, Operations Research, BioMathematics, Statistics, Coding information \& Theory, Geometry, Mathematics for chemists etc.
In order to procure books for research purpose and some journals and to improve research activities an annual grant of Rs 4 lacs is required. An additional annual grant of Rs. 1 lac is required for the procurement of furniture for the library (For year wise expenses see Table-I)

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## II. Travel:

a. Travel grant of Rs 4 lass is required annually for attending National/ International conferences, Seminars, Workshops and Staff Development Programmes (other than orientation and refresher courses) by members of faculty in the school of Mathematics. (For year wise expenses see Table-I)
b. Travel grant of Rs 1 lacs is required annually for the conduct invited/ guest lectures.
III. Scholarships: The School of Mathematics intend to provide scholarships to socially backward (SC/ST/OBC) students of M.Sc Programme and fellowships to Ph.D students. An annual grant of Rs. 9 lass is required for this purpose. (For year wise expenses see Table-I)

## IV. Organization of Seminars/Conferences:

To promote the interdisciplinary research and for the development of Higher Mathematics the school is planning to organize National/ International seminars/conferences every year shown in the table below.

| S.No. | Year | Topic/Title | National/International |
| :--- | :--- | :--- | :--- |
| 1 | $2012-13$ | Recent trends in Mathematics | National |
| 2 | $2013-14$ | Discrete Mathematics and Applications | National |
| 3 | $2014-15$ | International conference on Algebra, <br> Topology \& Analysis | International |
| 4 | $2015-16$ | Mathematical modelling and - its <br> Applications | National |
| 5 | $2016-17$ |  <br> Theoretical Computer Science | National |

Through these activities people of diverse interest may come to a common platform and share their views. These activities also led to the academic exposure to the members of faculty and explore new research problems. An annual grant of Rs 3-7 lass is required. (For year wise expenses see Table-I)
V. Educational Tours: In Indian scenario, usually Mathematics is studied as a subject without knowing its applications in engineering, other disciplines, research and industry. So, in order to make an interface of students with industry and research
organizations some educational tours are the demand of the hour. An annual grant of Rs 3 lacs is required to meet the expenses. (For year wise expenses see TableI).
VI. Contingencies, consumables $\&$ maintenance: To meet various needs of the school related to contingency, consumables \& maintenance an annual grant of Rs 2-3 lacs is required. (For year wise expenses see Table-I)

Prof. A. P. Singh, HOD, Mathematics, Central University of Rajasthan, Expert Member suggested that the School may also seek grant for online facility of journals.
Dir. SOM informed that this type of facility already exists in the central Library of the university.

The Board approved Recurring Expenditure of the school (for 2012-2017) for library, travel, scholarships, organisation of seminars/conferences, educational tours, contingencies, consumables \& maintenance.

### 1.5.7 Budget Estimates:

Projected Recurring Expenditure (in lacs)

| Financial Year | Salary for <br> Additional <br> staff | Library | Travel | $\begin{aligned} & \text { Scholarships/ } \\ & \text { fellowships } \end{aligned}$ | Organization of Conferences/ Seminars | Contingencies, consumables \& maintenance | $\begin{array}{\|l\|l\|} \hline \text { Educati } \\ \text { onal } \\ \text { Tours } \end{array}$ | Total |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2012-13 | - | 3 | 5 | 9 | 3.5 | 2.5 |  |  |
| 2013-14 | - | 3 | 5 | 9 | 3.5 | 2.5 | 3 | 26 |
| 2014-15 | 42* | 3.5 | 5 | 9 | $7 \quad \text { (for }$ | 2.5 | 3 | 26 |
|  |  |  |  |  | $\begin{aligned} & \text { int.conf.) } \end{aligned}$ | 2.5 | 3 | 72 |
| 2015-16 | 47* | 3.5 | 6 | 9 | 4 | 3 | 4 | 76.5 |
| 2016-17 | 52* | 3.5 | 6 | 9 | 4 | 3 | 4 | 76.5 |
| Total | 141 , | 16.5 | 27 / | 45 / | 22 | 13.5 | 17 | 81.5 |

*15\% annual increase.

## Projected Non- Recurring Expenditure (in lacs)

| Financial Year | Purpose | Expenditure |
| :--- | :--- | :--- |
| $2012-13$ | Renovation (faculty cabins, office etc.), furniture | 50 |
| $2013-14$ | Setting up of Research Centre in School | $30 /$ |
| $2014-15$ | - | - |
| $2015-16$ | Furniture for school library | 15 |
| $2016-17$ | Up gradation of Lab. | 20 |
| Total |  | $\mathbf{1 1 5}$ |

Table -II
$\mathbf{1 0 | P a g e}$


Year wise Total Expenditure (in lacs)

| Financial Year | Estimated expenditure |
| :--- | :--- |
| $2012-13$ | 76.0 |
| $2013-14$ | 56.0 |
| $2014-15$ | 72.0 |
| $2015-16$ | 91.5 |
| $2016-17$ | 101.5 |
|  | Total 397 |

Table-III
Building Expenditure

| Financial Year | Purpose | Expenditure |
| :--- | :--- | :--- |
| 2014-15 | Building with furniture | Rs. 732 lacs |
| Total |  | Rs 732 lacs |

Table-IV
The Board approved Budget Estimates of the School for 2012-2017.
The Meeting ended with a vote of thanks to the Chair.

(Dr. A. K. Das)
Convener

No: SMVDU/SOM/2012/1331
Dated: ZMarch, 2012
To
Dean, College of Sciences,

CC:

- Registrar, for information \& needful please.
- PS to VC for kind information of the Hon'ble Vice Chancellor.
- All members.
- Concerned File.

