

# FATIMA MATA NATIONAL COLLEGE

AUTONOMOUS

(Reaccredited with 'A' Grade by NAAC)

Affiliated to University of Kerala



## 1.1.1 Thrust Areas In Research

**IQAC** INTERNAL QUALITY ASSURANCE CELL

## **RESEARCH PRIORITIES@FATIMA**

### **DEPARTMENT OF BOTANY**

Centre for Advanced Research in Botanical Science (CARBS) is the research wing of Botany Department, instituted for carrying out quality research in Plant Science. Department is recognized as a research centre by Kerala University, for doing research leading to Ph.D. CARBS is now stepping into active research, with three recognized research supervisors and eight registered Ph.D. scholars. In addition to the Ph.D. programme, CARBS is also assisting and guiding the UG and PG students in the department to pursue their research, leading to the submission of dissertations. Now an external funded research project (SERB funded in the tune of Rs. 39 Lakhs) is ongoing, and the centre is now selected for infrastructural funding in the form SARD from KSCSTE, in the tune of Rs. 15 Lakhs. The thrust areas of research are:

1. Plant Biodiversity- Identification, Characterization and Sustainable Utilization
2. Reproductive Botany
3. Plant Physiology & Biochemistry
4. Nano Biotechnology
5. Biotechnology & Tissue Culture

## **DEPARTMENT OF PHYSICS**

There are three broad areas in which the faculty members of the department are carrying out research. First area is Applied Nuclear Physics, in which the major research has been on environmental radioactivity, radiation dosimetry and health effects of environmental radiation. The department has very successfully completed two minor research projects and three major research projects funded by various agencies including UGC, KSCSET, BARC and DAE. The studies carried out include effect of high background radiation in the area on congenital malformations (mental retardation, cleft lip and palate), ingested radiation dose to the public through food and Chromosome aberration frequency studies in the inhabitants of coastal Kollam. Minor research works include microanalysis of uranium in natural water, radio activity in building materials and the like.

Second branch in which a very high quantum of research has been carried out in the Department is Spectroscopic studies of medically and biologically imported complex molecules. The research activities in this area include Spectroscopic investigations, both experimental and theoretical, of aromatic bioactive molecules, Density Functional Theory computations of some organic compounds, FT-IR, FT-Raman, SERS and quantum chemical calculations of bioactive compounds. The researchers in this area have published numerous articles in high impact journals.

The third area in which active research has been initiated is on Nano materials, their preparation and their properties. The focus on this area ranges from solar cells to thin batteries.

Apart from these, research investigations on the ill effects of microwave communications on human health has also been started and meaningful studies are being carried including simulation studies on the Specific absorption rates of human cells of interest, mainly brain, eye and the like.

## **CHEMISTRY**

The PG Department of Chemistry was elevated to the research status in 2013 and active research is progressing. We have six faculty registered as research guides. Dr Suma N (Polymer Technology), Dr Biju Mathew (Analytical & Inorganic Chemistry), Dr Manohar D Mullassery & Dr Noeline B Fernandez (Medicinal & Environmental Chemistry), Dr Shibu Joseph (Nanomaterials), Dr Sarau Devi A (Co-ordination Chemistry)

The topics of present research are

- Environmental studies
- Water quality analysis
- Drug delivery studies
- Polymer technology
- Nanomaterials
- Co-ordination Chemistry
- Environment Friendly Research Topics
  1. Synthesis of graphene by Solar Exfoliation method
  2. Removal of heavy metals using biochars from banana stem
  3. Removal of heavy metals and dyes using ion exchangers
  4. Detection of Uranium concentration in water bodies.

## DEPARTMENT OF ZOOLOGY

The Department of Zoology became research centre under Kerala university in the year 1987. During the 32 years of its journey, produced 36 doctoral degrees, undertaken 19 major and 4 minor research projects from various funding agencies like University Grants Commission (UGC), MoEF, Asian Fishery Society, Philippines, Norway, IFS (International Foundation for Science), Sweden, CDS, KSCSTE, DBT, Western Ghat cell, Govt of Kerala.

### Thrust areas of research

- Pollution, Fish Biology, Gene Manipulation and Transgenesis, Fish Breeding and Aquaculture.
- Water pollution studies of various wetland ecosystem- Sasthamkotta freshwater system, Ashtamudi Lake (The Ramsar sites) and Vattakkayal (The notified wetland) got wide media attention. The centre have developed disease resistant transgenic fish, artificial breeding technology for endemic fish, live feed Daphnia culture etc. A first report of sexual dimorphism of a Western ghat fish *Hypselobarbuskurali* and an estuarine fish *Oxyurichthystentacularis* were done.
- Study on Macrobenthos of Kerala Coast, Immunostimulant Effects of various Herbal Extracts on Fishes were also undertaken.

## **DEPARTMENT OF ENGLISH**

The Post Graduate Department of English is recognized as a research centre of the University of Kerala for doing research leading to PhD degree. There are four research guides and 16 registered Ph D scholars. In addition to the PhD programmes, the research centre also provides facilities for the UG and PG students in the department to pursue their research, leading to the submission of dissertations/projects.

The thrust areas of research are as follows:

- Psychoanalytic theory
- Autobiographical studies
- Black feminism
- Literary theory
- Cultural Studies
- Dalit Writing
- Diasporic Studies
- Prison Literature

## **DEPARTMENT OF COMMERCE**

The Commerce Department was elevated to a Research centre of University of Kerala in 1996. Thrust areas of Research offered by the Department of commerce:

1. Banking and finance
2. Portfolio management
3. Rural management
4. Behavioural Finance
5. Micro Finance

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## **DEPARTMENT OF ECONOMICS**

The Economics Department was elevated to a Research centre of University of Kerala in 2006. Thrust areas of Research offered by the Department of Economics:

1. Economics of Fisheries
2. Economics of International Migration

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