

### **I (a) Innovation Incubation Centre**

Major goals of this **Innovation and Incubation Centre** are to promote socially relevant research in the Science Departments that enable technology-based entrepreneurship through production of new knowledge of industrial applications and to initiate the trial of the same for promoting industrial production. In the Current **scenario, Research is going on in various Science Departments without any idea of the immediate need to the society or that of the business or industrial sectors.** This centre is planned to overcome this issue by enabling students and faculties to identify and take-up need-based challenging research programmes aiming at translating their research output for the benefit of industrial growth of the country. It will focus imparting proper direction to researchers in taking up projects and getting sufficient funding for need-based research not only from public funded agencies but also from industries. **Through this centre the University will be able to bring science, technology, industry and business to a common platform to make education and research, an innovative and productive, socially committed process that truly support actual economic growth of the nation.** With the introduction of this concept, the University as a crucial organization entrusted with human resource development can prove that innovation is one of its basic duties on ways proliferate the spirit of entrepreneurship across the State and the Nation. This will be the first of its kind in a State University Campus in Kerala.

This centre will have facilities for nursery incubation project initiated by one or more members of the academic staff, students and / or alumni of the Mahatma Gandhi University Campus or other premier Colleges / Institutes, affiliated to the University, or some other technology promotion agency (government or non-government) with a view to trying out a novel technological idea for upgradation to a commercial proposition, scaling up a laboratory proven concept, and setting up a technology business enterprise in the campus. Basic Activities will be as follows:

1. Arrange the Industry-Academia collaborative programmes in Science and Technology to expose researchers of the University to take up challenging research initiatives which have industrial applications
2. Provide opportunities for the interested educated youth of the State to become entrepreneurs through technological and other supports as incubate companies in the Campus
3. Assistance of the centre will include provision of bank-assisted seed money, accommodation for entrepreneurs/trainees in the campus, mentoring, development of business plans, business promotion, incubation space of three sizes 500 sq.ft., 325 sq.ft. and 250 sq.ft. in the campus, seminar/conference hall, office support, library and documentation assistance, obtaining of finance, advertisement agencies, legal experts, and the like.

***1 (b) Educational Multimedia Research Centre (EMMRC)***

The vision of the centre is to generate high quality educational software that brings present ongoing research into perspective with respect to its parent subject as well as with respect to research in the field elsewhere in the world.

Generate e-material on key topics, focusing on how to apply the material taught in class in a problem solving context.

Generate e-material on basic principles that underpin the variegated facets of a given subject, with a bottom up (basics to frontier) approach so that it can be used by student/s over/with different levels of understanding.

Produce the material in English with subtitles in regional language.

## **I (c) Massive Open Online (MOOC) on Global Understanding at Mahatma Gandhi University**

Mahatma Gandhi University and North Carolina A&T University, USA are jointly conducting an online programme on Global Understanding with the cooperation of Kerala State Higher Education Council. Mahatma Gandhi University has already signed the letter of support of UNC-India Technology Learning Programme with the North Carolina State University (UNC), USA. As part of this, University has decided to conduct Massive Open Online (MOOC) on Global understanding this year.

### **What is MOOC?**

It is Massive Open Online Course and students of any discipline can join this course and the duration of the course is 3 months. This course offers a very unique opportunity for students to learn about other cultures in a face-to-face environment without having to leave their classroom. This class is designed to make the most of interactive technologies to give students the opportunity to communicate with students in different countries live time. This way, students at each participating University can learn about a number of different cultures while simultaneously helping to teach about their own. The cultural exchange is based both on written communications between pair of students (via 'chatting' and outside communication) as well as through "web-streamed" face-to-face dialogue.

### **COURSE OBJECTIVES**

- Offer students the opportunity to understand, explore and appreciate the nature of human diversity and globalization by providing a direct international experience in a virtual collaborative learning environment with students and faculty from other countries.
- Provide students with the tools and ethnographic methods necessary to effectively interact with, understand and learn from peoples of other cultures
- Provide students the unique opportunity to learn and apply skills for cross-cultural research and analysis.
- Foster international partnership via technology to develop trust, friendship and future opportunities for scholarly collaboration.

## **I (d) Strengthening of traditional Ayurvedic knowledge through modern scientific methods.**

### **Introduction**

Plants are the basis of our traditional Ayurvedic system of medicine. Plant based medicine dispensed in the form of crude drugs, as commonly used in traditional ayurvedic preparations, now serve as the basis for novel drug discovery in the context of modern medicine. To enrich and establish the Science behind Ayurveda, it is very essential to investigate the various active components both individually and collectively through modern scientific methods.

Till date only one percent of the total tropical plants have been studied for their pharmaceutical potential. Drug discovery from plants has evolved to include numerous interdisciplinary research fields and various methods of analysis.

### **Methodology:**

1. Identifying pharmacologically active components from traditional medicinal plants.
2. Their Extraction and Structural Investigations.
3. Investigation of their Interactions with relevant biological systems.
4. Pharmacologic al investigations.

### **Work undergoing:**

Studies involving active components from turmeric, pepper, cardamom, coriander and several other plants and their interactions with relevant macromolecular systems.

## **Convergence Academia Complex (CAC)**

### **Abstract**

The higher education sector globally has evolutionized in order to meet the challenging requirements in various fields. In order to meet these challenges, the Mahatma Gandhi University has started new centers in various innovative disciplines. It is envisaged that these centers will function as interdisciplinary centers and need to be brought together. The main aim of this proposal is to start a **Convergence Academia Complex (CAC)** to explore the various possibilities of accelerating academic and research programs cutting across all the disciplines.

These centers now functioning in the campus are performing extremely well in their respective fields in terms of bringing in research grants and starting new innovative academic programs. Some of the Centers are having intense industrial collaborations also in their various activities. In order to facilitate the activities of these centers, a common platform need to be provided and these facilities can be shared by these centers.

The CAC is envisaged as a G +7 storied building in the University campus, again in tune with the notion of convergence. In turn, each Convergence Centre shall have centre specific infrastructure facilities as well as common facilities. The latter shall include visiting faculty complex, library complex, computer lab complex, research scholars complex, laboratory complex, medium conference complex, food court, exhibition hall and a separate Conventions Centre.

The CAC is being built in the University campus with adequate facilities for commuting within the campus.

Total Estimate for the project: Rs.28, 44, 12,480/-

### **Goals and Objectives**

The proposed goals and objectives of the Centre are the following:

1. To promote and coordinate large-scale interdisciplinary research programs between the Centres, MGU research schools, NGOs, research institutions and industries in India and abroad leading to the technological development and fabrication of various products.
2. To initiate industry-research institutions / academia interface meetings in every year.
3. To facilitate mobility programmes for students with research institutions, NGOs and various academic institutions.
4. To conduct International Conference and Workshop in emerging interdisciplinary areas on a regular basis.
5. To provide consultancy services to industries and other required sectors.

## **I (e) University Consortium for Water Purification Technology**

The School of Environmental Sciences has started a major research cum extension programme focusing on providing clean drinking water through sustainable rainwater harvesting structures with community participation.

The objective of the current proposal is to undertake an innovative and intense research leading to the supply of clean drinking water to an impoverished community in a wetland area by reengineering the water harvesting systems and make them cost effective. It is also envisaged to use the solar radiation to produce clean fresh water (which is scarce in the study area) from saline water (which is available in abundance in the study area), the proposed innovative research component in it is to develop a cost effective, user friendly, household level solar still and solar disinfection (SODIS) system.

### **Toxic chemicals in the human environment**

The concentration of persistent toxic chemicals (metals, POPs etc.) is increasing in the environment. Human beings are exposed to such chemicals in their routine works. Also food and drinking water contains a lot of persistent and toxic chemicals which are mainly due to modern agricultural practices, leaching from the bottles / cans, additives etc. The use of such toxicants is high in the developing countries like India for various purposes. Hence it is very significant to find out the sources, background concentration, chemical transformations and pathway in the environment and also to frame policies for reducing exposure to toxic chemicals. The proposed study will assess the concentration and impact of toxic chemicals in human environment and will help in framing policies.

### **Deliverables / Expected outcome**

- Clean living environment free from sate dumps and contagious diseases. Waste is viewed as a resource and converted in to clean fuel, fibre and manure which are remunerative to the society particularly people at the bottom of the pyramid.
- A cost effective and sustainable rain water harvest and storage system.
- A user- friendly, cost effective solar still system with SODIS technology which can be installed at each household which can yield clean drinking water from saline / brackish water.
- A thorough report on the toxic chemicals present in the human environment, drinking water and food. This report will be useful in framing future policies leading to a healthier human resource to the country.

## **II (a) Institute of Human Resource Capacity Building**

The institute of Human Resource Capacity Building (IHRCB), proposed to be established under Mahatma Gandhi University, shall be a pioneering Centre of capacity building in respect of all stakeholders in the system – from post-graduate students and researchers to young teachers and staff of the University. It will be the first of its kind in the entire country seeking to sustain a multi – level problem-solving mechanism to address human resource management issues within the University system.

### **Rationale of the Institute**

The contemporary scenario of campus life, in general, and class rooms, in particular, unveils a plethora of issues ranging from stress-related breakdown, disorientation, disorderliness, abnormality, fear-psychosis, withdrawal mind-set, aggressiveness, passivity, inferiority complex, lethargy and apathy. Even students with high academic achievements fall into this condition of complex disorientation or breakdown, resulting in occasional dropouts or abysmal academic output. Many others have all pervasive inferiority complex because of the lack of adequate skills – from linguistic management to cognitive abilities. A part of the problem lies with the very socialization process in the institutional setting within which the stakeholders have to interact with multi-level actors – from peer groups to academic and administrative personnel.

Our contemporary experience reminds us that the intellectual abilities as well as sociability of stakeholders are at high risk today because of many pulls and pressures. More importantly, with the advent of the new medial culture, the level of sociability and, eventually, the very learning process itself is limited to gadgets and software-induced circuits of behavior. This obviously undermines the cognitive as well as communicative power of the individuals with all its attendant implications manifesting in inter-personal interactions and their social behavior. A campus is, by and large, an ensemble of social relations and, therefore, the problems in the campus cannot be isolated from the rest of the society. Insofar as the stakeholders in the campus are essentially to go back with all outputs (both positive and negative) generated within a given period, it is significant for the University system to ensure quality education, on the one hand, and a social milieu of capacity building in human resource management, on the other. The Institute is expected facilitative this twin-level task.

## **Aims**

### **The aims of the Institute include:**

1. Specialized training of post-graduate students, researchers and staff (both academic and administrative) in their professional and academic setting with a view to helping develop capacity building in the following areas:
  - (a) Cognitive development
  - (b) Skill development (both communicative and interactive)
  - (c) Inter-personal Relations management
  - (d) Programme Orientation and Induction
  - (e) Counseling and, if necessary, therapeutic facilitation

## **Programme and Activities**

The Institute is to conduct period training and orientation programmes for all stakeholders in the University. Some of these programmes include:

1. **Intensive Orientation / Induction Counselling Programme** for each batch of students under various programmes in Schools / Centres within a period of six weeks since the commencement of classes every year (to be conducted on Saturdays for 2-3 Schools / Centres under each Faculty for each programme). The sessions shall be led by eminent, competent experts in the respective fields recommended by the Core Committee of the Institute;
2. **Specialized Orientation Programmes** for the young teachers and staff of the University annually led by experts from diverse fields such as academics, counselors and social activists;
3. **Interactive Extension Programmes** for students and researchers. The current crop of post graduates students and researchers while quite proficient in their respective fields, are finding it difficult to cope up with unfamiliar situations in the campus setting. This is not because of a deficiency in technical skills or good ideas, but for the lack of fundamental issues like Self-confidence, Cognitive skills, Critical Thinking and the ability to convey their ideas articulately. The “Human Resource Capacity-Building and Interactive Extension Programme” aims at adding value to the individuals by rounding off their University education with those vital capacities which are in demand in the world. The programmes envisaged under the Institute addresses the following areas:
  1. Self Confidence
  2. Cognitive abilities and Soft-skills
  3. Critical Thinking
  4. Persuasion capacity
  5. Forming and presenting ideas articulately

The programme framework shall be based on variety of techniques of Critical Learning. The sessions shall be arranged in an interactive manner through a Multi-modal delivery mechanism in order to cover the different learning styles. The programme is to be designed in such a way that by the end of it, the students will be able to think, articulate and elaborate their thoughts, views and ideas even while under pressure in complex settings. They would be trained to deal with complex issues, speak to individuals or groups with enormous confidence and with a social orientation. Trainers from the respective fields can be engaged for the various programmes, besides the staff in place.

4. **One Year Diploma in Human Resource Capacity Building:** The Institute shall offer a diploma course in HRCB with a view to developing a genre of experts in the field who will lead similar capacity building programmes in all campuses and centres of higher learning.
5. **Learner Supporting Clinic:** The Institute shall have a permanent arrangement for catering to the demands of all stakeholders by providing Counseling and, if necessary, therapeutic facilitation in cooperation with the School of Behavioural Sciences, the University Health Centre and similar agencies in place within and outside the system. There shall be two permanent counselors and two soft-skill communication trainers for organizing various programmes and activities, besides other supporting staff.

## **II (b) Integrated M.Sc. (4 Year) and M.Sc Ph.D (5 Year) Programme**

### **Integrated B.Sc.-M.Sc. Programme**

Four year postgraduation programme is aimed at the possibility of giving an opportunity for talented youngsters (after 10+2 programme) to do specific postgraduate programme in various disciplines of basic sciences within a limited time-span, provided they acquire additional credits during the same period (Credits equivalent to a Masters Degree in limited time after their +2 programme).

The newly introduced Rashtriya Uchathar Siksha Abhiyan (RUSA) in the country also advises the same. By this way, RUSA envisages that Universities can attract the most talented minds to basic science programme as young as possible, thereby promoting more research oriented interdisciplinary need-based postgraduate programs fostering entrepreneurship in the country. It will also enhance the employability of science postgraduate in industrial sector, which overall boost industrial development of the nation.

The curriculum for the first two semesters (first year) is common to all students and specialization begins from the third semester. The core courses in the subject of specialization provide strong foundations in both theoretical and experimental aspects of the discipline. Even after specialization in second year, students are required to go through a certain number of courses in other disciplines. All students are required to go through a small number of compulsory courses in humanities, technical communication, history of science, environmental and energy sciences. The third year of the integrated M.Sc. Programme is devoted to advanced courses in various sub-disciplines.

In the fourth year every student will undertake a guided research project. The outcome of the investigation will be reported in the form of a thesis. Throughout the four-year programme, students will be encouraged to take up summer projects and visit reputed national laboratories and universities. Eminent scientists from India and abroad will be regularly invited to give colloquia / seminars and interact with the students. In short the curricula are designed to ensure depth in the area of specialization together with breadth of exposure an intellectual enrichment and to prepare the students for high level professional research and development career in national laboratories, universities and industry. If they are interested in pursuing a research career, they will be admitted to Ph D Programme in the fifth year.

## **Integrated M Sc.-Ph D Programme**

Five year Integrated M.Sc. Ph D programme also is aimed to catch the talented young graduate to complete their research degree in limited time so that they can focus quality as well as employability in prescribed time limits. Conventional Ph D programmes are time consuming and not very much employment focused. Postgraduates who have no other employment opportunity usually go for Ph D in such conventional programmes. In the integrated Ph D programme, students need to accept the research career at an early age. They can start the same with a determination to achieve an industrial opportunity or an opportunity for entrepreneurship by the end of their integrated M. Sc. Ph D programme. The RUSA also advise Universities to focus such programmes in the future.

Integrated M.Sc. Ph D programme is meant for the talented young graduates who have completed the conventional 10+2+3 scheme of graduation. Such conventional B.Sc. students will be required to take a minimum of 12 courses and carry out an M.Sc. level project before he/she joins the Ph. D research stream. All Ph.D Scholars will be required to qualifying written and oral comprehensive tests and candidacy examinations before submitting the thesis. The thesis will be examined by external reviewers. It has to be publicly defended and the candidate will be declared successful before award of the Ph. D Degree.

## **II (c) E- Learning**

E-Learning programme envisages creation of quality online courses and manage learner outcomes. This would allow faculties to create e-content for teaching which would be available to all faculty and students for learning purpose. The students on their part can have access to the study materials which makes them prepare for the class. The classroom in addition to teaching learning a place for healthy discussion as the student will be prepared with the materials that will be discussed. Examinations (internal as well as external) may be conducted and results would be available to the CSS exam section as soon as the evaluation is done by the faculty.

This requires the establishment of workstations and or servers linking the Library, University departments / centres and the administrative section (admissions, exams and departmental office).

Library could function as the nodal point for the e-learning programme. There should be high internet connectivity between the Library, Departments / Centres and the Administration. The departments will have terminals sufficient enough for all faculties and students which will be linked to the library and the administrative sections.

Initially faculties and administrative members will be trained on this e-learning platform. Faculties should also be trained in developing e-content for their respective areas of expertise and administrative members and students should be trained on using the e-learning platform.

Various e-learning platforms are available some of which are open source software which can be downloaded and installed. However, the users need to be trained for handling which is normally done by the vendors who are authorized for this

Moodle is a course management system (CMS) – a software package designed to help educators to create quality online courses and manage learner outcomes. Such e-learning system are sometimes also called Learning Management System(LMS), Virtual Learning Environments (VLE) and Learning Content Management System (LCMS). Students need only a *browser* (e.g., IE, Firefox, Safari) to participate in a Moodle course.

Moodle is Open Source software, which means you are free to download it, use it, modify it and even distribute it (under the terms of the GNU General Public License). Moodle runs without modification on Unix, Linux, Windows, Mac OS X, Netware and any other system that supports PHP, including most web host providers. Data is stored

in a single database: MySQL and PostgreSQL are best supported, but it can also be used with Oracle, Access, Interbase, ODBC and others.

Moodle has 50 language packs, including: Arabic, Catalan, Chinese (simplified and traditional), Czech, Danish, Dutch, English (UK and US versions), Finnish, French (France and Canada versions), German, Greek, Hungarian, Indonesian, Italian, Japanese, Maori, Norwegian, Polish, Portuguese (Portugal and Brazil), Romanian, Russian, Slovak, Spanish, Swedish, Thai and Turkish.

I (d) **Educational Multimedia Research Centre (EMMRC)**

An EMMRC produces Educational material in soft format that can be used as lecture material or as self reading / study material.

The outline that was given lists out the kind of activities the MGU EMMRC can undertake

1. With respect to the research going on in the University – this can be presented in a format from base to frontier so that aspiring students from anywhere in the country / world can get an idea and if interested can join for Ph D / as summer project students thus increasing the reach of the University.
2. Generally the syllabus is vast and teachers often do not get sufficient time to train the students in applying the concepts learned in class to actual problems. The EMMRC may put up material suited to developing the problem solving skills of students and it will be useful even for teachers and not just for interested students
3. E – material for self study – here the bottom up approach of NCERT text books may be used where the same topic is gradually developed as the child moves from first standard to tenth. The scope and depth of the presentation is gradually increased over several levels. This makes it useful for a wide range of students / adults from a wide range of disciplines to access the material and study the topic at the pace they want and at the level they want.
4. The basic material may be produced in English with provision to provide subtitles in any language the ultimate user might want. Some other agency can buy it / loan it from MG University and provide subtitles in their own language.

**R E C E I P T**

Received from the Finance Officer, M.G University an amount of  
Rs...../- (Rupees .....  
.....only) towards TA / DA & Sitting Fee for attending the Planning Board  
Meeting at 10.00 A.M., in the Chamber of the Vice Chancellor, on 26.06.2014.

.....,  
.....,  
.....

**P.D. Hills**

**Dated:**