

# The OSU-AMU Pilot Project Gets Award Under OBAMA-SINGH 21<sup>st</sup> Century Knowledge Initiative



## 1. The Obama-Singh 21<sup>st</sup> Century Knowledge Initiative Award

The Aligarh Muslim University (AMU) has now acquired the distinction of being selected as one of the four partner institutions in India for the second round of awards under Obama-Singh 21<sup>st</sup> century knowledge initiative. A pilot project titled **“The STEM Faculty Project: Training the Next Generation of STEM Faculty at Higher Education Institutions in India”** was jointly submitted to USIEF by OSU (US) with AMU as partner institution in India. The US Secretary of State, John Kerry, on his 3 day official visit to India, announced on 25 June 2013, the tie-ups and collaborations between Indian and US educational Institutions. The Obama-Singh 21<sup>st</sup> century knowledge initiative (OSI) was launched in 2009 by Prime minister of India Dr. Manmohan Singh and President Barack Obama of US as a gesture of commitment to support education coalition between India and the US with each nation pledging USD 5 million. Each of the selected projects shall get USD 250,000. The OSI is administrated by the United States India Educational Foundation (USIEF) whose aim is to strengthen mutual understanding between the two countries through educational exchange. There is no doubt that this OSI award will help to increase AMU’s international reputation for excellence.

The approval of STEM project is the result of relentless efforts of Brig. S. Ahmad Ali, Pro Vice-Chancellor, Aligarh Muslim University, Prof. Wasi Haider, former Chairman of the Department of Physics, AMU, Prof. S. Alim H. Naqvi, Coordinator Nanotechnology Program, AMU, Prof. Nisar Ahmad, Department of Computer Engineering, AMU, Prof. Anil Pradhan, and Dr. Sultana Nahar both of The Ohio State University USA.

The implementation of the STEM faculty project shall be done under the esteemed patronage of AMU’s Vice-Chancellor, **Lt. Gen. Zameer Uddin Shah** who was instrumental in shaping this unique global collaborative venture between AMU and OSU. Dr. Anil Pradhan, Professor in the Department of Astronomy at Ohio State, and a co-director at Aligarh Muslim University will lead the project with strengthening teaching and research at both institutions. Brig. Syed Ahmad Ali, Pro Vice-Chancellor, AMU went through the draft of the project in great detail and made very useful suggestions which were incorporated in the text.



## 2. The Novel Features of the OSU-AMU Pilot Project

- **Establish** a joint STEM Education and Research (ER) Center at AMU.
- Develop a novel two-year STEM-ER program for Indian graduate students to train in teaching STEM subjects to undergraduate students, as well as to conduct state-of-the-art research.
- **Award** dual-degrees to selected students, in STEM education at OSU and graduate research at AMU.
- **Contribute** substantial direct and indirect resources as cost-sharing, equal to or exceeding the amount requested from USIEF, including tuition and fees waiver from OSU for admitted AMU students. AMU to provide local hospitality to visiting faculty from OSU.
- **Initiate** interdisciplinary collaborative projects of mutual benefit in advanced research and innovation in key areas, such as nanotechnology and information technology.
- **Involve** private industry and OSU-AMU alumni in support of the STEM-ER program.
- **Direct** the outcomes of this pilot project towards formalizing a comprehensive Indo-US inter-university cooperation between leading universities in the U.S., such as the Committee on Institutional Cooperation (CIC) universities including OSU, and the Central universities in India including AMU.
- **Prepare** a report for submission to governmental agencies to facilitate large-scale Indo-US collaboration in STEM faculty education, research, and innovation.

Apart from teaching of science and engineering at undergraduate level, research projects will be under taken in interdisciplinary areas such as nanotechnology and information technology. The areas of research and expertise for OSU and AMU faculty under this project shall include spectroscopy, nanotechnology, renewable energy, information technology, environmental sciences, cancer research, mathematical research and educational research.

## 3. Benefits to AMU and OSU

- Powerful impetus to activities in STEM fields at AMU across many departments and disciplines.
- OSU shall become a truly global university.
- Exchange visits:

<i>Anticipated Number of U.S. Participants in Exchange Visits: Males: 9, Females: 4</i>	<i>Anticipated Number of Indian Participants: Males: 8, Females: 1</i>
<i>Participants' Occupations:</i>	<i>Participants' Occupations:</i>
<i>Teachers/Faculty: 8, Researchers: 9</i>	<i>Teachers/Faculty: 7, Researchers: 7</i>
<i>Administrators: 3, Graduate Students: 1</i>	<i>Administrators: 2, Graduate Students: 4</i>
<i>Other (please specify): 1 Public-Private Partner</i>	<i>Other (please specify): 1 Public-Private Partner</i>

**Total duration of all exchange visits:** U.S. Participants: *3 weeks per participant* Indian Participants: *3 weeks per participant.*

#### 4. Calendar of Activities

A 3-year timeframe is envisaged for this proposal. Mainly, the first year will be devoted to the formal development of the plan at OSU and AMU and the next two years to its implementation.

**Year 1:** The STEM-ER Center will be set up and made operational during the first year. This will entail faculty/staff exchanges to formalize the STEM education and research curriculum, form the Steering Committee and the Selection Committee for examining applicants, and general administrative infrastructure. Details of the STEM education and research curricula would be finalized for approval before implementation of Phase and Phase 2 in the next two years.

Four students will be selected following a competitive applications process. The competition will be open to all graduate students in STEM subjects at AMU. Special consideration will be given to women students and two of the selected students will be female. Selected students will be divided into two batches. The first batch will convene the first year of their study at OSU and the second year at AMU. The second batch will do the same in reverse order. The intent is to ascertain which of the two formations is optimal for the future.

The exchange of four OSU and four AMU faculty and staff members will take place during the first year to work out and implement the educational agenda, as well as to initiate new projects for collaborative research.

**Year 2: Phase 1** – The first batch of 2 AMU students will embark on studies at OSU for two semesters (outlined in detail in Section 7). Concurrently, the second batch of AMU students will undergo similar training. Both batches will choose and initiate research projects jointly with their AMU advisors and visiting OSU advisors. Exchange visits by two instructors and researchers from each side will also take place. All courses at both universities will be team-taught, with approximately 5 instructors involved in any given semester and teaching for approximately 3 weeks each.

Progress of the project will be carefully monitored. End-of-year evaluation will be carried out and mid-course corrections made if necessary.

**Year 3: Phase 2** – First batch will return to AMU and commence the Indian part of the STEM training program, as well as continue joint research program. The second batch of 2 AMU students will arrive at OSU, having already completed one year at AMU.

A final report on the project will be prepared for submission to USIEF.

#### 5. Outcomes

Tangible outcomes at the completion of the 3-year period of this pilot project.

- A comprehensive MOA between OSU and AMU dedicated to the STEM Faculty Project and wider collaborations in a number of areas of mutual interest.
- An operational STEM education and research center at AMU, involving at least 30 faculty/staff/student members from OSU and AMU/
- Four highly trained AMU students in STEM education, with an M.Ed from OSU, as well as specialization towards a doctorate or graduate degree at AMU.
- An exchange research program on state-of-the-art sciences and technologies of global importance.
- External funding from U.S. and Indian scientific and technological agencies.
- A final project report for submission to the Government of India for cooperation between U.S. and Indian universities following the model set forth by the OSU-AMU pilot project.

## 6. Future Plans

This pilot project is designed to lead to a much larger collaboration between consortia of CIC (Committee on Institutional Cooperation) universities and major central Indian universities. A new program supported by the U.S. and Indian governments would be proposed as an outcome of the initial phase.

The modalities for a future CIC-India initiative could comprise of the following elements.

- Concordance with the 12<sup>th</sup> 5-year Plan: Follow the contours of the Concept Note on Innovation Universities Aiming at World Class Universities.
- Form an equitable partnership with a consortium of Indian universities with similar aims, involving major central universities first and state universities later.
- Build upon existing connections between CIC member universities and Indian universities.
- Standardize accreditation system for joint or dual STEM-ER degree program.
- Enable interested faculty members in each CIC-Indian university partnership to develop common curricula.
- Provide administrative oversight of common education and research programs by partner universities.
- Constitute a CIC-India STEM-ER Board to oversee the implementation of the above elements.
- We suggest an initial phase based on the dual-degree alternative. The joint-degree option can be explored as the program develops, with crucial input from the practical experience gained from the first phase. The joint-degree program would be different from the existing framework, and would require approval at various levels at each institution and taking account of programmatic considerations of the envisaged consortia of institutions.

## 7. Action Plan for a Joint India-US Program

Steps to be undertaken during the three-year time span of the proposed pilot project entail the following.

- Seek administrative input and approval from CIC universities, associated colleges, and STEM faculty.
- Focus on selected central universities in India as initial members of the **Joint India-US STEM Consortium**.
- Prepare a list of prospective partner universities in India and database of existing education-research programs.
- Submit a proposal under the USIEF Obama-Singh initiative for a partnership between OSU and Aligarh Central University.
- Organize a symposium in India in Year 2 to discuss the proposal to UGC, DST, and other governmental agencies.
- Approach organizations such as the US-India Educational Foundation (USIEF) and the Indo-US Science and Technology Forum (IUSSTF) for support and guidance.
- Involve other governmental agencies in the U.S. and India, via the U.S. embassy in India and the Indian embassy in Washington, DC.
- Inculcate private-public collaborations with organizations such as the Chambers of Commerce, Confederation of Indian Industry, and a selected variety of private enterprises including multi-national corporations.
- Establish joint centers for Innovation and Research at Indian institutions with multi-lateral participants: Indian universities, CIC universities, Indian government agencies, U.S. government agencies, and Indo-US business groups.
- Develop a joint proposal for submission to the Indian and U.S. governments to support the establishment of the STEM-ER centers at Indian universities.

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