



**THE OHIO STATE UNIVERSITY**

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*Preparing STEM Faculty for  
Indian Universities:  
USA & India Collaboration Year 1*

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# Obama-Singh 21st Century Knowledge Initiative Award





# Sponsor

US India Education Foundation  
(USIEF)

## Objective for grant rfp

5-Year program collaboration and partnership for educational reform, economic growth, and development of <sup>3</sup>



## PARTNERS:

### Aligarh Muslim University & OSU

- Motto (English): Taught man what he did not know (Qu'ran 96:5)
- Established: 1877
- Type: Public
- Vice Chancellor: Lt. Gen. Zameer Uddin Shah
- Academic Staff: 1,342
- Students: 28,000



**AMU**



**AMU**



# FUNDING

awarded summer 2013

## *Proposal*

*Training the Next Generation of STEM Faculty at Higher Education Institutions in India*

## **Source**

Obama-Singh 21st Century Knowledge Initiative  
award of the US-India Education Foundation  
(USIEF)



## **NEED in INDIA –**

- 300,000 faculty members for existing & upcoming institutions serving 150 million students
- Current infrastructure insufficient



# Proposal–

- Prepare world class faculty for Undergraduate institutions
- World class teaching skills
- World class research skills



# DUAL DEGREE PROGRAM

Participants complete -

- **PhD** program at AMU in a STEM field
- **Master in Education** (MED) degree program in two years at OSU and AMU



# OSU CONTRIBUTION

- Fellowship – tuition and fees
- 4 students in pilot (2 male; 2 female)
- Monthly stipend
- Research apprenticeship with matching STEM advisor



# PLANNING

- Advisory group at OSU and AMU
- Steering committee
- AMU group met Sept 2013
- Dr. Anil Pradhan and Dr. Sultana Nahar represented OSU





# PLANNING

- MOA and MOUs
- OSU Vice Provost William Brustein & AMU Pro-VC Brig. Ahmed, and VC General Shah
- Creation of STEM-ER Center of Excellence at AMU





# STEM-ER Center AMU



- Creation of STEM-ER Center of Excellence at AMU
- Technology center for distance education courses



# STEM-ER Center AMU



Technology center for faculty  
training



# **MED program adjustments at OSU**

- Modify current MED program
- Substitute college teaching apprenticeship for student teaching
- Replace courses needed for Ohio licensure with research with OSU advisors



# MED program adjustments at OSU

- Present to curriculum committee and receive OAA approval





# PROGRAM ELEMENTS:

## Year 1

- **50% Education**
  - Learning and cognition
  - Multicultural
  - Science methods
  - Assessment
  - Research Apprenticeship – education
- **50% STEM**
  - Research Apprenticeship – science



# PROGRAM ELEMENTS

## Year 2

- Apprenticeship Teaching Experience at AMU
- College Teacher Portfolio
  - Planning element
  - Teaching element
  - Assessment element
  - Modeled after the EdTPA assessment
- Capstone Experience at AMU



# MED Obama-Singh Program

	Summer 2014	Autumn 2014	Spring 2015	Summer 2015	Autumn 2014	Spring 2015
1.	STEM Teaching Methods I (3) 5711, 5721	Reaching All Students in STEM (3) 5743	Internship (8) 5191-	Reading Across the Curriculum (3) If Needed 5442	Field Experience in India, practice teaching	Independent Study - Thesis project (3)
2.	Learning & Cognition (3) 5741	STEM Teaching Methods II (5) 5722	Seminar (3) 5195-	Research AMU/OSU advisor	Research, AMU/OSU advisors (5)	
3.	Multicultural & Global Perspectives 6808 (3) [replacing Reaching all Students in STEM (s) 5743]	Technologies used in STEM (3) 5744-	Assessment in STEM I: Introduction & Methods (3) 5745			
4.		Field Experience (2) 5189	Research with OSU A&S or Eng advisor (8)			
5.		Reflective Seminar (2) 5195-				
6.		Apprenticeship UG Ed & A&S; 8898 (3)				
7.		Research with OSU A&S or Eng advisor (8)				
	6 semester hours	16 semester hours	11 semester hours	0 semester hours	5 semester hours	3 semester hours



# SELECTION PROCESS

- Academic excellence (determined by AMU)
- Three letters of recommendation
- SKYPE interview with open ended protocol (OSU)
- Post Candidacy students in dissertation stage
- Match to OSU research field



# COHORT 1

- Selected spring 2014
- Arrived OSU August 2014
- Currently partnered with STEM advisors and participating in the pilot year program



# COHORT 1

<b>Student</b>	<b>Gender</b>	<b>Field</b>	<b>Partner Scientist Department</b>
AR	male	Biochemistry	Radiobiology
AM	male	zoology/genetics	Center for RNA Biology
NR	female	biochemistry	Radiology
HN	female	Atomic spectroscopy	Astrophysics



# INITIAL CHALLENGES

- Negotiating university systems for off-cycle international admissions
- Housing
- Distance education
- Balance between education and STEM opportunities



# INITIAL CHALLENGES

- Balance between education and STEM opportunities
  - Adjustment to OSU
  - Multiple 'extra' opportunities
  - Only 24 hours in the day
  - Unfamiliar with cultural expectations regarding faculty/students



# ANTICIPATED FUTURE CHALLENGES

- Scaling up to 10 students with multiple cohorts at the same time
- Multicultural course – how to adapt the course we have to the Indian context
- Match between Indian research fields and OSU research fields was difficult for four students



# ANTICIPATED FUTURE CHALLENGES

- Expansion to other universities in India
- Inclusion of education faculty at AMU
- Expansion to Saudi Arabia and other countries
- Funding for all of the above



# ANTICIPATED FUTURE CHALLENGES

- Potential to make case that undergraduate professors in STEM fields need preparation for teaching



Questions?

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