Experiment Centric Pedagogy and Home-based Hands on Learning in STEM Summer 2020 Virtual Workshop

June 3 & 4, 2020

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MSU|SOE Clarence M. Mitchell, Jr. School of Engineering

About the Workshop

The ongoing coronavirus pandemic has forced colleges and universities to adopt completely online educational learning environments. There is a growing concern in STEM fields about how students will be able to achieve one of the major learning outcomes without conducting physical hands-on laboratory exercises; an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering/scientific judgement to draw conclusions (ABET Outcome 6). The purpose of the virtual workshop is to teach/train STEM faculty on how to develop inexpensive home-based hands-on laboratory exercises in their STEM courses.

Speakers are national expert in hands-on- learning in STEM education: Dr. Kenneth Connor, Emeritus Professor from Rensselaer Polytechnic Institute the originator of Experimental Centric Pedagogy; Dr. James Brown, the Grandfather of Online Science; and Dr. Aldo Ferri, an expert on Hands on Learning in Engineering.

Topics will include:

- Introduction to Experimental Centric Pedagogy (ECP)
- How to Introduce ECP into Teaching and Laboratory Exercises
- Home-based hands-on learning in science
- Hands-on learning in mechanical engineering and aerospace engineering using portable devices

The free two-day workshop will be held on June 3 and June 4. Participants will be able to interact with the speakers during live sessions. All sessions will be recorded. Registered attendees will get access to all recordings. See the attached flyer and the bios. Register today or contact Dr. Oludare Owolabi for any questions at Oludare.Owolabi@Morgan.Edu.

Speaker Bios

Dr. Kenneth Connor

Dr. Kenneth Connor is a professor emeritus in the Department of Electrical, Computer, and Systems Engineering (ECSE) at Rensselaer Polytechnic Institute where he teaches courses on electromagnetics, electronics and instrumentation, plasma physics, electric power, and general engineering. His research involves plasma physics, electromagnetics, photonics, biomedical sensors, engineering education, diversity in the engineering workforce, and technology enhanced learning. He learned problem solving from his father (ran a gray iron foundry), his mother (a nurse) and grandparents (dairy farmers). He has had the great good fortune to always work with amazing people, most recently professors teaching circuits and electronics from 13 HBCU ECE programs and the faculty, staff and students of the SMART LIGHTING ERC, where he is Education Director. He was ECSE Department Head from 2001 to 2008 and served on the board of the ECE Department Heads Association from 2003 to 2008.

Dr. Aldo Ferri

Dr. Al Ferri received his BS degree in Mechanical Engineering from Lehigh University in 1981 and his PhD degree in Mechanical and Aerospace Engineering from Princeton University in 1985. Since 1985, he has been a faculty member in the School of Mechanical Engineering at Georgia Tech, where he now serves as Professor and Associate Chair for Undergraduate Studies. Dr. Ferri's research has received funding from a number of sources including: Honeywell, Inc., the National Science Foundation, NASA, The Air Force Office of Scientific Research, the Office of Naval Research, and General Motors Corporation. Since joining the School of Mechanical Engineering in 1985, he has taught a wide variety of classes in dynamics, modeling, control, numerical methods, and vibrations. His research areas are in the fields of dynamics, controls, vibrations, and acoustics. He is also active in course and curriculum development. He is a Fellow of the ASME.

Dr. James Brown (Grandfather of Online Science)

President at James W. Brown Associates LLC.
Dr. Brown is an award-winning pioneer in online course delivery especially in science, health sciences, nursing and public health. He has recently been designated one of the to 40 Innovators in Education by the Center for Digital Education. He teaches science, health sciences and public health online for a number of colleges and universities including the American Public University System.

Schedule

Date	Time	Topic	Objective	Presenter(s)
6/3/2020	9:00 – 9:15 am	Introduction	Project overview & goals for workshop	Ladeji-Osias
	9:15 – 11:00 am	Spring 2020 Implementation & Fall 2020 Plan	Each Discipline will present their experience and challenges with the Implementation of M2k and M1k in Spring 2020 the proposed Fall 2020 projects on design of inexpensive hands-on homebased lab exercises.	Discipline Faculty (Biology, Physics, IE, CE, Chemistry, Transportation) *Moderator: Owolabi*
	11:00 – 11:15 am	Break		
	11:15 am-12:30 pm	Experiment Centric Pedagogy	Intro to ECP, details about ECP and how to Incorporate ECP in teaching and laboratory exercises	Connor
	12:30 – 1:15 pm	Lunch on Your Own		
	1:15 – 3:15 pm		Discussion and training on inexpensive homebased hands-on laboratory exercises without M2k and M1k, in multiple ETA-STEM disciplines	Connor
	3:15 – 4:00 pm		Breakout by Discipline – Hands-on activity	Connor
	4:00 – 4:30 pm		Discussion and closing	Ladeji-Osias
6/4/2020	9:00 – 11:00 am		Home-based hands-on learning in science	J. Brown
	11:00 – 11:15 am	Break		
	11:15 am-12:45 pm		Results of ETA-STEM MSLQ and Hands-on Lab survey (EE & CE)	Bista & Gaullee
	12:45 – 1:30 pm	Lunch on Your Own		
	1:30 – 2:30 pm		Hands-On Learning (HOL) in Mechanical Engineering and Aerospace Engineering using portable devices	A. Ferri
	2:30 – 3:30 pm		A quick overview of the ETA-STEM NSF Improving Undergraduate Stem Education (IUSE) grant evaluation process	K. Gullie and D. Spaulding
	3:30 – 3:45 pm	Break		
	3:45 – 4:30 pm		Discussion, Evaluation and Wrap Up	Ladeji-Osias