NUMERICAL CLIMATE PREDICTION

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Overview

Earth has limited water resources, which are varied spatially and temporally. In addition to that, stress on water resources has been increasing day by day. The stress on water resources will further increase due to climate change, which is likely to alter the components of hydrological cycle such as rainfall, evaporation, runoff, and so on. Semi arid regions of the developing world, which are already facing major water resource management and food security problems, are likely to be the most severely impacted. This emphasizes the need to assess and take consideration to climate change impacts in the adaptive management of water resources in semi arid regions.

Several numerical methods are available to understand the climate systems and their change. Regional Climate Models are very much useful for analysis of climate extremes, which are necessary for assessment of risk and vulnerability to hydro-climatological hazards such as flood and drought conditions in the specified areas. Weather Resource Forecast (WRF) model is widely used for climate prediction purposes. Different aspects of climate prediction and modelling, down-scaling, and impact analysis are part of the course syllabus for water resources engineering, environmental engineering and remote sensing and GIS graduate students of Civil Department of NIT Warangal. Many students are already using climate model output in their research work for modeling the various aspects of the water resources, so this course is relevant for engineering students.

The main contents of the proposed course are: climate systems, numerical methods, statistical methods, regional climate models, and dynamical down-scaling using the Weather Research and Forecasting (WRF) model. The course will also include hands-on activities using WRF-ARW model.

Modules	**A: Theoretical aspects of Climate systems; Numerical methods; Statistical methods** **B: Regional climate models and dynamical down-scaling using WRF model** **(18th to 29th June 2018; 30 Lectures & 10 Lab. Sessions)** Number of participants for the course will be limited to fifty.
Dates for the course	**18th to 29th June 2018**
You Should Attend If…	▪ **You are a field engineer or research scientist working in the fields of climate science, climate change impact studies** ▪ **You are a student or faculty from academic institution interested in learning how to work/carrying out research in climate prediction and climate change impact studies**
Fees	The participation fees (Excluding Lodging & Boarding) for taking the course is as follows: **Students Participants and Scholars : Rs. 2,000/-** **Faculty (Internal & External) & Scientists : Rs. 4,000/-** **Persons working in Industry / Consultancy firms : Rs. 8,000/-** **Student participants from abroad : USD 100** **Other participants from abroad : USD 200** The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation on payment basis.
Evaluation and Grading	**Students registered with grading will be evaluated for two credits based on continuous evaluation in tutorials, midterm and end of course examinations. Grade will be awarded based on the performance in the evaluation.**

The Faculty

International Expert

Dr. Michel d.S. Mesquita is the Head of Research and Development at Future Solutions in Norway. He is also a Research Scientist at Uni Research Climate and the Bjerknes Centre for Climate Research. He has a masters degree in geophysics and climate science from the University of Bergen (Norway), and in 2009, he earned a PhD degree in Atmospheric Sciences from the University of Alaska Fairbanks (USA). He has 48 publications on large- scale dynamics, including sea-ice-atmosphere interaction, storm tracks, teleconnectivity, downscaling, climate modeling, hydrology, science education, and climate ecology. His work also includes a Nature Climate change paper about the role of uncertainty in regional and global climate models. Michel worked as the Principal Investigator of the C-ICE project, funded by the Norwegian Research Council, which focuses on understanding how melting of Antarctic sea ice could affect the Indian summer monsoon. He is currently the Principal Investigator of the PREPARE project, funded by the Norwegian Ministry of Foreign Affairs and the Norwegian Embassy in India, which focuses on creating a climate extreme atlas for engineers and decision makers. He has also led the NORINDIA project, funded by the Norwegian Research Council, which studied the hydrological impacts of climate change in India.

Michel has also been a Visiting Faculty at TERI University in India and has previously worked as a Group Leader of the Regional Climate Modeling group at Uni Research, managing 20 research scientists, and a co-Leader of the RG5 modelling group at the Bjerknes Centre. He has also developed the software: e-WRF, " WRF for educational purposes," and he is the founder of the m2lab.org science education programme, which has educated more than 600 researchers worldwide (on WRF, R, and Bayesian statistics).

Institute Expert :

K. Venkata Reddy, Ph.D. is an Associate Professor in the Department of Civil Engineering at the National Institute of Technology Warangal. He is carrying out research on watershed modelling applications and climate change impact on water resources. He has carried out post-doctoral research work at Texas A&M University on the topic 'Impact of Climate change on Water Resources'with Raman Fellowship given by GOI under Singh-Obama 21st century Knowledge Initiative 2012 for the year 2013-14. He is actively involved in the research aspects of integrating the SWAT model with the Climate Models for effective study of watershed processes under climate change conditions. He is also teaching the SWAT model concepts to Post Graduate students and guiding the post graduate and research scholars on the applications of SWAT model in assessment of the water resources. He has published more than 60 research papers in National and International conferences and journals in the field of geospatial applications in different domains with main emphasis on water resources.

Two week GIAN

course on

NUMERICAL CLIMATE PREDICTION

18th June- 29th June 2018

Course Coordinators

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