Circular Economy and Resource Recovery for Sustainability

(15 – 19 March 2021)
Department of Chemical Engineering, NIT WARANGAL

1. Overview

The circular economy (CE) is the concept in which products, materials (and raw materials) should remain in the economy for as long as possible, and waste should be treated as secondary raw material that can be recycled to process and re-use. This distinguishes it from a linear economy based on the, 'take-make-use-dispose' system, in which waste is usually the last stage of the product life cycle. CE is a concept promotes sustainable management of materials and energy by minimalizing the amount of waste generation and their reuse as a secondary material. The urban wastewater treatment plants can be an important part of circular sustainability due to integration of energy production and resource recovery during clean water production. A Holistic Approach is needed to evaluate the sustainability of water reuse. CE may lead to a "paradigm shift" to enhance resource recovery. Currently the main drivers for developing wastewater industry are global nutrient needs and water and energy recovery from wastewater. Nevertheless, the characteristics of local water markets have often determined the feasibility of water reuse systems, and economics have resulted in the major barriers to an actual development of water reuse. This course presents current trends in wastewater treatment plants development based on Circular Economy assumptions, challenges and barriers which prevent the implementation of the CE and Smart Cities concept with WWTPs as an important player. WWTPs in the near future are to become "ecologically sustainable" technological systems and a very important nexus in Smart Cities.

Leading international academics and researchers with extensively recognized expertise, and demonstrated ability in teaching, consultancy, research, and training will deliver lectures and discuss industrially relevant case studies in the course.

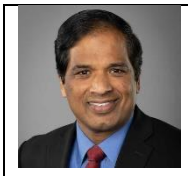
2. Objectives

The primary objectives of the course are as follows:

i) Exposing participants to the concept of circular economy for sustainability,
ii) To explain different methods for resource recovery in wastewater treatment facilities,
iii) Providing exposure to practical problems and their solutions, through different case studies,
iv) Enhancing the capability of the participants to apply circular economy models for long term benefit in wastewater sector.

Dates	15 – 19 March 2021
Modules	• Circular Economy in wastewater infrastructure: Introduction, Approaches, Water-Economy Nexus. • Policy frameworks affecting circular economy approaches to wastewater treatment and resource (water, energy, nutrients) recovery. • Resource recovery: Methods and limitations of water recovery for potable and non-potable applications • Resource recovery: Methods and limitations of nutrient recovery • Sludge treatment to minimize environmental impact • Intersections of water-energy-nutrient recovery and conflicts/synergies • Sludge treatment to recovery resources • Novel value chain configurations for product recovery from sludge • Wastewater treatment plant as a water resource recovery facility – conceptual modeling and simulations • Circular economy action plans to develop water-economy nexus • Sustainable water management in SMART Cities of the Future
You Should Attend If…	▪ you are a faculty member/research scientist in chemical /civil/environmental/biotechnology/relevant engineering discipline interested in wastewater treatment, resource recovery, sustainability, circular economy. ▪ you are a professional engineer interested or working in sustainable wastewater treatment, resource recovery, circular economy. ▪ you are a UG/PG student or research scholar interested in learning sustainable wastewater treatment, resource recovery, circular economy.
Fees	The participation fees for taking the course is as follows: **Participants from abroad : US $100** **Industry/ Research Organizations: Rs. 6,000/-** **Faculty: Rs. 3,000/-** **Students & Research Scholars:** **Without award of Grade: Rs. 1,000/-** **With award of Grade: Rs. 1,500/-** The above fee includes all instructional materials, tutorials and assignments. The participants from academic/research institutes and Industry will be provided with boarding and lodging on additional payment of Rs. 4,000/- in NIT campus on sharing basis. Students & Research Scholars will be provided with boarding and lodging in Institute Hostels on additional payment of Rs. 2,500/-.

The Faculty



Prof. Krishna R. Pagilla, is Ralph E. and Rose A. Hoeper Professor of Civil and Environmental Engineering at the University of Nevada, Reno. He is also the Director of Nevada Water Innovation Institute, a university-utility collaboration to meet local water technology and development needs, and to drive leading edge research and innovation in the water sector. Dr. Pagilla's expertise is in the fields of water quality, water resource recovery, indirect potable water reuse, and environmental biotechnology. He has published over 100 peer-reviewed journal papers and over 100 other publications including conference proceedings. His research group at the University of Nevada, Reno consists of 9 PhD students, 5 MS students, 3 BS students, and a research associate professor, and the research focus is on indirect potable reuse, human health effects of water reuse in agriculture, N pollution control, density-biomass function relationships in biological processes, P recovery, and water-economy nexus.
https://www.unr.edu/cee/people/krishna-pagilla

Dr. Uday Kelkar, Managing Director of NJS Engineers India (a wholly owned subsidiary of NJS Co. Ld., Japan) has more than 30 years of experience in the field of environmental engineering. He holds Masters and Doctoral Degrees in Civil/Environmental Engineering from, Virginia, USA. Dr. Kelkar has served in various capacities on a number of design/engineering projects in water and sanitation sector in USA, Middle East, Sri Lanka and India. His specific experience include; advance treatment processes including nutrient removal, membrane tertiary treatment process, advance oxidation and disinfection, recycling/reuse of wastewater for non-potable and indirect potable use. Dr. Kelkar has more than 150 technical papers/presentations and has received "Hall of Fame Award" as one of the **"50 Most Influential People in the Indian Water Industry"**. He holds Professional Engineering License from State of Michigan and is a Certified Environmental Engineer from American Academy of Environmental Engineers.

Course Coordinators

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	Dr. A. Seshagiri Rao is an Associate Professor in the Department of Chemical Engineering at NIT Warangal, India. His research interests include Wastewater treatment, circular economy, Process modeling, process control. He is recipient of INAE young engineer award and IIChE young researcher award in 2014. He published over 57 peer reviewed international journal articles and over 60 conference papers. He guided 5 PhDs and 35 Masters projects. Currently, he is supervising 4 PhDs in different areas of wastewater treatment and control. https://www.nitw.ac.in/faculty/id/16460/	