

## Course Overview

The demand for aquatic food is anticipated to surge to 21–44 million tonnes by 2050, reflecting a 36–74% increase in seafood consumption. This surge occurs amidst an immediate global threat from overfishing, with approximately 90% of fish stocks fully or over-exploited and more than a third being fished at unsustainable levels. Overfishing not only jeopardizes the ecological integrity of marine and freshwater systems but also threatens global economies and essential protein sources for many communities worldwide.

Blue circular economy proposes a series of tangible solutions designed to support resilience in aquatic food systems and ensure fisheries and aquaculture grow sustainably while leaving no waste behind. While knowledge exists on potential technological possibilities, their use is under- or unexploited, mainly due to lack of know-how, proof of concept, or financing. This approach will go beyond the state-of-the-art to develop climate- and environment-friendly products and processes.

## Objectives

- Impart knowledge to the stakeholders to understand the expectations and consumer values in the seafood and freshwater market
- To involve blue economy sector stakeholders in co-creation and food system design.
- To perform consumer study on LTS based ingredients substitution possibilities with existing ingredients
- To employ novel technologies for marine a freshwater
- To analyze the impact of novel technologies on food sustainability
- To apply technologies in real life scenario

## Teaching Faculty



Professor B K Tiwari, **PhD, FIFST, FRSC** is a Principal Research Officer at TEAGASC and Adjunct Professor at UCD School of Biosystems and Food Engineering, obtained his PhD at the University College of Dublin (Ireland) in 2009. Before starting his PhD, he was employed as a Research Scientist at the Indian Institute of

Processing Technology (IICPT, India). Demonstrated ability to fund, manage and lead a high quality, innovative and multi-disciplinary food processing research group with a strong international reputation. Current Advanced Food Technologies Research Group comprises 21 researchers. Strong track record in development of intellectual property including patents and technology transfer to industry. Research group is funded through various competitively won sources including the EU 7th Framework Programme, Horizon 2020, Science Foundation Ireland, Irish Research Council, Irish Department of Agriculture, Food & the Marine, Enterprise Ireland and industry.

Principal Supervisor/co-supervisor of 14 (13 PhD and 1 Masters) research thesis completed. Sustained successful track record in obtaining external research funding from EU, SFI, DAFM, EI and industry. Strong publication track record includes over 175 peer reviewed journal papers, 88 international conference papers, 84 book chapters, 1 patent, 10 edited/authored books and 1 book series (IFST Advances in Food Science Series).

Excellent collaborative research links with national/international industry, academic and food research centres as evidenced by joint national/overseas funding awards and research outputs. Fellow of Royal Society of Chemistry (FRSC), Fellow Institute of Food Science and Technology (UK), Elected member of the Food Engineering group of Institution of Mechanical Engineers (IMechE). He appointed Editor – in – Chief of Journal of Food Processing and Preservation, Guest Managing Editor (Food research International; Innovative Food Science and Emerging Technologies). He is also a member of the Editorial Board of Food Engineering Reviews (Springer) and Ultrasonic Sonochemistry (Elsevier).

10 Days\* GIAN Course on

## Innovative approaches for sustainable BLUE CIRCULAR BIOECONOMY of food and feed value chain

December 20 - 29, 2024



### Course Instructor

**Prof. Brijesh K Tiwari,**

Adjunct Professor, UCD School of Biosystems and Food Engineering

Principal Research Officer, Food Chemistry and Technology,  
Teagasc Food Research Centre, Ashtown, Dublin  
D15 KN3K, Ireland.

### Course Coordinators

**Dr. Madhuresh Dwivedi**

Associate Professor

Department of Food Process Engineering  
National Institute of Technology, Rourkela 769008 Odisha.

**Prof. Rama Chandra Pradhan**

Professor

Department of Food Process Engineering  
National Institute of Technology, Rourkela 769008 Odisha.



Department of Food Process Engineering  
**National Institute of Technology, Rourkela**  
Odisha, India.

# Course Contents

**Day 1**  
**Lecture 1:** Mapping socio-economic-scientific aspects of marine and freshwater ecosystems  
**Lecture 2:** Innovative processes and novel ingredients for waste reduction and sustainability  
Tutorial & Laboratory 1: Outlines the role of novel processing technologies for developing sustainable food system in our economy and global environment

**Day 2**  
**Lecture 3:** Innovative food & feed products  
**Lecture 4:** Innovative and sustainable packaging approach  
**Lecture 5:** Zero waste approach towards sustainability  
Tutorial & Laboratory 2: Shaping the value chains for successful marketing of new products

**Day 3**  
**Lecture 6:** New valorization routes from fisheries, aquaculture and seafood processing streams  
**Lecture 7:** High value ingredients that meet healthy and technological requirements for food and feed development in the context of a circular economy (e.g. proteins, chitosan's and lipids)  
**Lecture 8:** Sustainable cultivation pathways for duckweed and microalgae using wastewater as a resource  
Tutorial & Laboratory 3: Innovative processes and novel ingredients for fisheries and aquaculture waste reduction and sustainability

**Day 4**  
**Lecture 9:** Transformational strategies: To utilize the obtained high value ingredients obtained in new food and fish feed product development.  
**Lecture 10:** Evaluation of growth performance for fish fed on formulated feeds  
Tutorial & Laboratory 4: 2US and European perspectives, Innovative food & feed products will be outlined.

**Day 5**  
**Lecture 11:** To design the new products in line with the specific consumer requirements  
**Lecture 12:** The role of agri-food systems in our economy and rapidly changing environment.  
Tutorial 5: To characterize the products obtained in terms of nutritional value, bioactive, techno-functional and sensory properties

## Course Coordinator



Dr. Madhuresh Dwivedi is an Assistant Professor in Department of Food Process Engineering of NIT Rourkela. He received his PhD in the area of Food Process Engineering from IIT Kharagpur, India in 2015. Before joining NIT Rourkela as an Assistant Professor in 2018, he has

worked as an Assistant Professor at Indian Institute of Plantation Management (2017 - 2018), and University of Allahabad, Allahabad (2015 - 2017). His research area focusses on new product development and Novel thermal and non-thermal technology.



Prof. Rama Chandra Pradhan is a Professor in Department of Food Process Engineering of NIT Rourkela. . He received his PhD in the area of Food Process Engineering from IIT Delhi.

Before joining NIT Rourkela as an Assistant Professor in 2014, he has worked as a Assistant Professor in BHU Varanasi. His research interest includes non-thermal processing of food, Non-Timber forest produce, modelling.

## Who can attend?

- ❖ Executives, Food engineers and researchers from manufacturing, service and government organizations including R&D laboratories.
- ❖ Faculty from reputed academic institutions and technical institutions.
- ❖ Students at all levels (BTech/MSc/MTech/PhD)

## Certificate

Participation certificate will be give to all the participants.

## Event Type

This is an international event. Lectures will be offered in the Offline mode only.

## Registration Fee

Participants from abroad	\$ 250/-
Industry/ Research Organizations	Rs 5000/- (incl. GST)
Academic Institutions (Students)	Rs 2000/- (incl. GST)
Faculty/Scientist	Rs 3000/- (incl. GST)

The above fee is only for participation in the event in the Offline mode. Lecture materials, and necessary reading material will be provided.

**\*Foreign teaching faculty will handle the course from NIT Rourkela.**

The Participant need to send the willingness to attend the Course at <https://forms.gle/WcGoV98fqUmCBKNSA> latest by **15 November 2024**.

Upon receipt of Willingness Course Coordinators will sent the registration link to the selected students

## How to Register?

1. Accepted Candidate are requested complete payment through NEFT Transfer to the following account details: Name of the Beneficiary: Continuing Education NIT Rourkela; Name of Bank: State Bank of India; Branch Code: NIT Rourkela; Branch Beneficiary Account No.: 10138951784; Bank MICR Code: 769002007; Bank IFS Code: SBIN0002109.

## Important dates and venue

Last date for Registration	December 02 2024
Course Schedule	December 20 - 29, 2024
Venue	NIT Rourkela

## Contact Details

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Department of Food Process Engineering  
National Institute of Technology Rourkela  
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#### Day 6

**Lecture 13:** To design smart labels prototype for packaging demonstration

**Lecture 14:** Compostability and biodegradability evaluation of biobased packaging

Tutorial 6: Innovative and sustainable packaging approach

#### Day 7

**Lecture 15:** Consumer requirement and optimization techniques

**Lecture 16:** Innovative approaches for product development

Tutorial 7: Product Development on surveyed product from algal biomass

#### Day 8

**Lecture 17:** To map and quantify waste generation for aquatic farm to fork

**Lecture 18:** To promote innovative measures to reduce wastage at consumer level

Tutorial 5: Zero waste approach towards sustainability

#### Day 9

**Lecture 19:** To design, test and deploy a thorough sustainability plan and IPR management strategy

**Lecture 20:** To develop innovative business models and a sound go-to-market strategy.

Tutorial 5: Shaping the value chains for successful marketing of new products

#### Day 10

**Lecture 21:** Mixotrophic cultivation of microalgae

**Lecture 22:** Product development model for marine and freshwater.

Certificate Distribution and feedback



**Course in completely Offline**

**December 20 - 29, 2024**

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**Department of Food Process  
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Odisha, India**