

# International Summer School- Manipal University Jaipur [ISSMUJ]-2024

[Hybrid Mode]



## Course Overview

**Name of Course- Designing Transition metal-based Catalysts to utilize in Green reactions.**

Name of Instructor: Dr. Sriparna Ray

Session: June-July 2024

Language of instruction: English

Number of contact hours: 36

Credit awarded: 03

Pre-requisite: *Science in 10+2 level*

### Objective of Course/Project

This project would involve

- Learning the 12 principles of Green Chemistry
- Synthesis of novel Schiff base ligands.
- Synthesis of transition metal complexes of the Schiff bases.
- Catalysis of various organic transformations under Green reaction conditions, to be carried out with the transition metal complexes.
- Computational validation of the transition metal complexes to be followed.

### Syllabus:

Twelve principles of Green Chemistry; elementary knowledge of carrying out reaction between simple organic molecules; knowledge of synthesizing transition metal complexes; basic knowledge of carrying out catalytic reactions using undergraduate Chemistry laboratory practices.

### Organization of Course

Total contact hrs 36		
1st week:	10 hrs (classes)	2 hrs (self-study/project)
2nd week:	10 hrs (classes)	2 hrs (Mid term exam/assessment/discussion)
3rd week:	10 hrs (classes)	2 hrs (End term exam)

**Mode of lectures:** Hybrid mode lecture/videos/case study/ discussion/ workshop/ hands-on

### Course/Project Plan

Lecture no.	Topic	Lecture mode	Instructor
L: 1-6	Learning the first six principles of Green Chemistry	online lecture/ discussion	Dr. Sriparna Ray
L: 7-12	Learning the last six principles of Green Chemistry	online lecture/ discussion	Dr. Sriparna Ray
L: 13-18	Synthesis of novel Schiff base ligands	discussion/ workshop/ hands-on	Dr. Sriparna Ray
L: 19-24	Synthesis of transition metal complexes of the Schiff bases	discussion/ workshop/ hands-on	Dr. Sriparna Ray
L: 25-30	Catalysis of various organic transformations under Green reaction conditions to be carried out with the transition metal complexes	discussion/ workshop/ hands-on	Dr. Sriparna Ray
L: 31-36	Computational validation of the transition metal complexes to be followed	online lecture/online videos/discussion	Dr. Sriparna Ray

### Brief profile of the instructor with Photograph

I am currently working as an Assistant Professor in the Department of Chemistry, Manipal University Jaipur, India. Among the different courses taught by me, Green Chemistry is a prominent one. This topic is, currently, one of the most investigated areas of research. One aspect of my research incorporates various types of Catalysis, including homogeneous catalysis by organometallic complexes, biocatalysis as well as bioelectrocatalysis. I am also interested in designing and synthesizing new inorganic molecules, which can have various applications ranging from sensors to pharmaceutical applications. I have over 15 years of research experience in the interdisciplinary areas of Chemistry and Biochemistry and have published research articles in internationally reputed Chemistry journals and a book chapter. I am currently supervising three PhD students, who are working in the field of catalysis.

