



# PERICYCLIC REACTIONS AND ORGANIC PHOTOCHEMISTRY

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**PRE-REQUISITES :** Basic course in organic chemistry, stereochemistry and reaction mechanisms

**INTENDED AUDIENCE :** Core for post-graduates, Post-graduate and upper level undergraduate, Final Year BSc, MSc and PhD

**INDUSTRIES APPLICABLE TO :** Pharma and fine chemical industry R&D labs, National labs such as NCL, IICT etc

### COURSE OUTLINE :

Concerted organic reactions and organic photochemistry are important topics in any Chemistry postgraduate curriculum. Pericyclic reactions which come under concerted organic reactions are governed by Woodward-Hoffmann rules. This course will uncover all the major topics in pericyclic reactions and organic photochemistry

### ABOUT INSTRUCTOR :

Prof. S. Sankararaman has 25 years of teaching and research experience at IIT Madras. He teaches theory courses on organic chemistry, organometallic chemistry, spectroscopy and photochemistry to MSc and PhD students in addition to teaching basic organic and inorganic chemistry courses to B.Tech students. He has written a textbook on Pericyclic Reactions published by Wiley-VCH in 2005. His research interests are in the areas of organic and organometallic chemistry, organic synthesis and catalysis.

### COURSE PLAN :

**Week 1:** General introduction to the course, activation of chemical reactions.

**Week 2:** Electrocyclic reactions - introduction, definition and classification, Woodward-Hoffmann rules for electrocyclic reactions, Stereochemical aspects and modes of electrocyclic reactions,

**Week 3:** Electrocyclic (continued), Cycloaddition reactions, Woodward- Hoffmann rules for cycloaddition reactions,

**Week 4:** Examples of thermal and photochemical [2p+2p] cycloaddition reactions

**Week 5:** 1,3-Dipolar cycloaddition reactions, higher order cycloaddition reactions

**Week 6:** Sigmatropic rearrangements - examples, Claisen and Cope rearrangements

**Week 7:** Organic photochemistry -introduction, definitions, importance Electronic excitation

**Week 8:** Photochemistry of olefins, enones and dienones, photochemistry of aromatic molecules, molecular oxygen and organic photochemistry,