

# Introduction to Electron Paramagnetic Resonance Spectroscopy

National Taiwan University  
Department of Chemistry

Fall Semester 2001

Credit: 2 units

## Course Description

This course is designed for graduate students and advanced undergraduates doing research in chemistry who are interested in an in-depth exposure to electron paramagnetic spectroscopy, as applied to chemistry, biochemistry, and the biomedical sciences. The course will begin with an introduction to the spectroscopy of electron paramagnetic resonance, and proceed to discuss the application of this spectroscopy to

- (a) organic free radicals
- (b) biradicals and organic triplets
- (c) spin-labels
- (d) transition metals
- (e) metalloproteins.

In addition, it will cover a number of modern experiments, including

- (a) Fourier transform EPR
- (b) Transient EPR
- (c) ENDOR
- (d) ESEEM

as these techniques are used to probe electronic structure and molecular structure in paramagnetic systems.

The student enrolling in this course should have completed a course in modern physical chemistry, and have some fundamental knowledge about elementary quantum mechanics and quantum chemistry. After the student has completed this course, he/she should be prepared to know when and under what circumstances EPR methods could be applied to various chemical, biochemical

and biological problems. He/she should also be in the position to read the literature involving papers where these methods are used to derive electronic and molecular structure information about chemical, biochemical and biological systems.

This course will meet two hours per week. The time has been designated to be 10 a.m. - noon every Wednesday morning. The lectures will be given in English.

The course grade will be determined by homework and a term paper on some aspects of EPR or some application of this spectroscopy to chemical, biochemical and biological systems.

### Course Materials

1. Handouts and lecture notes will be provided.
2. Recommended books for further reading:

Andrew McLachlan, "Introduction to Magnetic Resonance", John Wiley & Sons, New York, NY