

## **EE6401            ADVANCED DIGITAL SIGNAL PROCESSING**

Acad Unit:            3  
Prerequisite:        Nil  
Effective:            Acad Year 2006/07  
Last update:        January 2006

### **OBJECTIVE**

The purpose of this course is to provide in-depth treatment on methods and techniques in discrete-time signal transforms, digital filter design, optimal filtering, power spectrum estimation, multi-rate digital signal processing, DSP architectures, which are of importance in the areas of signal processing, control and communications. Applications of these methods and techniques are also presented. The intended audiences are research students and industry professionals working in the above-mentioned areas and related technical fields.

### **DESIRED OUTCOME**

The topics covered in this course provide solid and comprehensive foundation for other more specialized areas in signal processing, control, and communications. At the end of the course, students would be able to apply fundamental principles, methodologies and techniques of the course to analyze and design various problems encountered in both academic research and industry R&D practice.

### **OTHER RELEVANT INFORMATION**

The course requires knowledge of mathematical concepts in linear algebra and integral transform, and fundamental linear system theory.

### **CONTENT**

Discrete signal analysis and digital filters. Power spectrum estimation. Linear prediction and optimal linear filters. Multi-rate digital signal processing. DSP Architectures and applications.

### **ASSESSMENT SCHEME**

Continuous Assessment	20%
Final Examination	80%

### **TEXTBOOKS**

1. J.G. Proakis and D.G. Manolakis, Digital Signal Processing: Principles, Algorithms and Applications, Third Edition, Prentice-Hall, 1996
2. S. Haykin, Adaptive Filter Theory, Prentice-Hall, 1997.

### **REFERENCES**

1. E.C. Ifeachor and B.W. Jervis, Digital Signal Processing –A practical approach, Second Edition, Prentice-Hall, 2002
2. P.P. Vaidyanathan, Multirate Systems and Filter Banks, Prentice-Hall, 1993.