Programme Détaillé par Matière

EE471: Probability and Statistics

Course Information:

Semester: I	**Unit**: UEF11	**Credit Hours:** 6	**Coefficient:** 4
Lecture: 3 hrs/week	**Recitation:** 1.5 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 67.5

Course Objectives:

Knowledge of basic notions of probabilities, how to deal with the random variables, different types of distributions and solving probability problems by choosing the right corresponding distribution

Course Prerequisite(s):

Basic notions of mathematics, computing single and double integrals

Course Outline:

- **Review of Set Theory**
- **Combinatorial Analysis**
- **Probability Definitions**
- **Random Variables, Random Vectors**
- **Some statistics**
- **Some Probability Models**
- **Limit laws: The Central Limit Theorem**
- **Some Statistics**
  - Estimation of Means, Variance, Proportion, Confidence Intervals
  - Introduction to Hypothesis Testing
  - Linear Regression.

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. R. B. Schinazi et R. B. Schinazi, *Probability With Statistical Applications*. Springer, 2001.
2. A. Papoulis, *Probability and Statistics*, 1st ed. Prentice Hall, 1989.

EE473: Advanced Differential Equations

Course Information:

Semester: I	**Unit**: UEF11	**Credit Hours:** 6	**Coefficient:** 4
Lecture: 3 hrs/week	**Recitation:** 1.5 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 67.5

Course Objectives:

To develop, deepen and extend the concepts and tools acquired in previous linear Algebra course.

Course Prerequisite(s):

A course in calculus and a course in linear Algebra

Course Outline:

- **Some Calculus**
- **Ordinary Differential Equations: a continuation**
- **Calculus of Variations**
- **Partial Differential Equations:**
  - First Order PDE
  - Second Order PDE (Linear)
  - Some case studies: Laplace equation, Wave equation and Heat equation for example.

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. G. Stephenson et P. M. Radmore, Advanced Mathematical Methods for Engineering and Science Students. Cambridge University Press, 1990.

2. T. M. U et L. Debnath, *Linear Partial Differential Equations for Scientists and Engineers*. Springer, 2007

EE475: Complex Variable

Course Information:

Semester: I	**Unit**: UEF11	**Credit Hours: 6**	**Coefficient:** 4
Lecture: 3 hrs/week	**Recitation:** 1.5 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 67.5

Course Objectives:

The objective of this course is to introduce the student to basic complex variable function analysis, namely to provide the necessary tools to deal with the analysis of analytic functions

Course Prerequisite(s):

A basic course in analysis (single variable calculus)

Course Outline:

- **Algebra of complex numbers**
- **Function of a complex variable**
- **Analytic functions**
- **Power series**
- **Residues theorem and its applications**
- **Integrals**
- **Conformal mappings**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. Ahlfors, Lars V. Complex Analysis : An introduction to the Theory of Analytic functions of One complex variable. 3d Ed. Nex York, McGraw-Hill, 1979.

2. Caratheodory, Constantin. Theory of functions of a complex variable. Vol.2 , NY, Chelsea, 1960.

EE461: Advanced Electromagnetic Field Theory

Course Information:

Semester: I	**Unit**: UEF12	**Credit Hours:** 6	**Coefficient:** 4
Lecture: 3 hrs/week	**Recitation:** 1.5 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 67.5

Course Objectives:

The main objective of this course is to help students to be able to develop principles of guided waves and to introduce radiation by obtaining the complete field solution.

Course Prerequisite(s):

Electrostatics, Magnetostatics, Maxwell's equations and general electromagnetic wave propagation.

Course Outline:

- **Reflection and Transmission**
- **Oblique Incidence**
- **Guided Waves**
- **Electromagnetic potentials**
- **Electromagnetic Theorems**
- **Applications**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. Nannapaneni Narayana Rao, "Elements of Engineering Electromagnetic ", 6th Edition, Pearson Prentice Hall 2004.

2. Sophocles J. Orfanidis, "Electromagnetic Waves and Antennas", 2008.

3. Constantine Balanis, "Advanced Engineering Electromagnetics "John Wiley 2012

EE411: Microwave Engineering

Course Information:

Semester: I	**Unit**: UEF12	**Credit Hours:** 4	**Coefficient:** 3
Lecture: 3 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 45

Course Objectives:

Knowledge to design microwave transmission lines and waveguides, design impedance matching networks for specific application and be familiar with S-parameter terminology to describe circuits and microwave components.

Course Prerequisite(s):

Calculus, Circuits and Electromagnetic Field

Course Outline:

- **Introduction to Microwave Engineering**
- **Transmission Lines**
- **Some Specific Guiding Systems**
- **Microwave Wave-Guides**
- **Scattering Parameters**
- **Microwave Components**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. Pozar David M., "Microwave Engineering", Fourth Edition, John Wiley, 2011.

2. Robert E. Collin, "Foundations of Microwave Engineering", Second Edition, John Wiley, 2007.

3. Peter A. Rizzi, "Microwave Engineering: Passive Circuits", First Edition, Prentice Hall; 1987.

EE463: Radio Wave Propagation

Course Information:

Semester: I	**Unit**: UEF12	**Credit Hours:** 2	**Coefficient:** 2
Lecture: 1.5 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 22.5

Course Objectives:

This course aims to provide a comprehensive knowledge of fundamentals of radio wave propagation in real telecommunication systems

Course Prerequisite(s):

Electromagnetic field theory.

Course Outline:

- **Introduction**
- **Ground wave propagation**
- **Ionosphere effects on radio wave propagation: Sky wave propagation**
- **Line of sight propagation**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. J. S. Seybold, "Introduction to RF Propagation " John Wiley & Sons Inc., 2005.

2. R. L. Freeman, "Radio System Design for Telecommunications" John Wiley & Sons Inc., 2007.

3. C. Haslett, "Essentials of Radio Wave Propagation" Cambridge University Press, New York, 2008.

4. H. Sizun, "Radio Wave Propagation for Telecommunication Applications" Springer, 2005

EE472: Numerical Methods

Course Information:

Semester: II	**Unit**: UEF21	**Credit Hours:** 4	**Coefficient:** 3
Lecture: 3 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 45.0

Course Objectives:

Many problems in science, technology, economy etc. can be modeled by mathematical formalisms whose exact solutions are either unknown or are computationally expensive. In these cases, a set of techniques, known collectively as Numerical Methods, produce efficiently approximate solutions to exact solutions.

Course Prerequisite(s):

A basic course in calculus; A basic course in computer programming

Course Outline:

- **Introduction:** Mathematical Preliminaries and Error Analysis.
- **Solutions of equations of one variable:** Bisection, Secant, and Newton-Raphson Methods,. Error Analysis
- **Solution to a system of equations:** Linear Algebraic Methods (Direct Methods (Gauss Elimination, Matrix Factorization, Special Matrices, Iterative Methods. The Jacobi and Gauss-Siedel Methods, the Conjugate Gradient Method Error Analysis.
- **Numerical Integration:** Quadrature Rules, Romberg Integration, Error Analysis.
- **Interpolation and Polynomial Approximation:** Introduction, Lagrange Polynomials, Spline Interpolation, Error Analysis.
- **Numerical Solution of Initial-Value Problems:** Taylor's Methods, Runge-Kutta's Methods, Error Analysis.
- **Approximating Eigen-Values**: Introduction, The Power Method, The Householder's Method, The QR Method, Error Analysis.

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. H.M. Antia. *Numerical Method for Scientists and Engineers*. Mc Graw Hill, 1995.
2. W. Dos Passos. *Numerical Methods, Algorithms and Tools*. Taylor and Francis Group, 2010
3. *Numerical Methods*. Faires & Burns. 2002.

EE412: Digital Signal Processing

Course Information:

Semester: II	**Unit**: UEF21	**Credit Hours:** 4	**Coefficient:** 3
Lecture: 3 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 45.0

Course Objectives:

This course will build on the knowledge acquired in the two preceding courses of linear systems. The main objective of this course is to help students to design and implement digital filters using many different approaches.

Course Prerequisite(s):

The student is supposed to have attended continuous and discrete time linear systems courses.

Course Outline:

- **Sequences and systems**
- **The Z-transform**
- **Properties of analog systems**
- **Signal flow graph and implementation**
- **Design of digital filters**
- **Discrete and fast Fourier transform**
- **Applications of the discrete Fourier transform**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. J. G. Proakis, and D. G. Manolakis, "Digital Signal Processing, principles, algorithms, and applications " Prentice-Hall, 3rd edition 1996.

2. A. V. Oppenheim, and R. W. Schafer, " Discrete-time Signal Processing'' Prentice Hall; 3rd edition, 2009.

EE414: Advanced Communications

Course Information:

Semester: II	**Unit**: UEF22	**Credit Hours:** 4	**Coefficient:** 3
Lecture: 3 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 45.0

Course Objectives:

At the end of the course, the student should be able to analyze communication systems using a probabilistic point of view. The course insists on digital communication using signal space methods.

Course Prerequisite(s):

- Probability and random variables.

- Signal and system theory (Fourier methods).

Course Outline:

- **Review of Probability and Random Variables.**
- **Introduction to Stochastic Processes.**
- **Baseband Communication Systems.**
- **Basic Digital Modulation.**
- **Signal Space Methods.**
- **An introduction to Coding.**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. B. Carlson, *Communication Systems*, 5th éd. Mcgraw Hill Higher Education, 2009

2. S. Haykin et M. Moher, *An Introduction to Analog and Digital Communications*, 2e éd. Wiley, 2006.

EE416: Antennas

Course Information:

Semester: II	**Unit**: UEF22	**Credit Hours:** 4	**Coefficient:** 3
Lecture: 3 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 45.0

Course Objectives:

The objective of this course is for each student to be able to design basic antenna and array structures, know the terminology of antennas, understand the concepts of antenna analysis, and be familiar with the major antenna and array type

Course Prerequisite(s):

Calculus and Electromagnetic Field

Course Outline:

- **Introductions to Antennas**
- **Fundamental Parameters of Antennas**
- **Radiation of a Source in Unlimited Medium**
- **Theory of Radiating Apertures**
- **Microstrip Patch Antennas**
- **Antenna Arrays**
- **Theory of Antenna Arrays**
- **Linear Antenna Arrays**
- **Planar Antenna Arrays**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. C. A. Balanis, "Antenna Theory: Analysis and Design," Third Edition, John Wiley, 2005.

2. W. L Stutzman and G. A. Thiele, "Antenna Theory and Design," Second Edition, John Wiley, 1998.

3. J. D. Kraus and R. J. Marhefka, "Antennas for All Applications," Third Edition, 2002.

4. L. V. Blake and M. W. Long, "Antennas: Fundamentals, Design, Measurement," Third Edition, Scitech Publishing, 2009.

EE418: Optical Fiber Communication Systems

Course Information:

Semester: II	**Unit**: UEF22	**Credit Hours:** 4	**Coefficient:** 3
Lecture: 3 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 45.0

Course Objectives:

This course provides the student with a theoretical and hands-on background in Optical Fiber Communication Systems. It will permit to obtain a familiarity with most major areas of optical communications.

Course Prerequisite(s):

Communication Systems

Course Outline:

- **Introduction to Optical Fiber**
- **Optical Sources**
- **Optical Detectors**
- **Transmission Characteristics of Optical Fiber**
- **WDM, DWDM and CWDM Systems: Principles and Technology**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. L. G. Kazovsky, S. Benedetto, A. E. Willner, "Optical Fiber Communication Systems," Artech House, Jun 1996.

2. J. Gowar, "Optical Communications Systems," Prentice-Hall, London 1984.

3. G. P. Agrawal "Fiber-Optic Communication Systems," 4th Edition, Wiley, November 2010.

EE442: Electrical Networks Analysis

Course Information:

Semester: II	**Unit**: UEF22	**Credit Hours:** 6	**Coefficient:** 4
Lecture: 3 hrs/week	**Recitation:** 1.5 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 67.5

Course Objectives:

To learn various electrical circuits analysis techniques, to familiarize with two-port networks and to learn various frequency response plots and understand their significance in filter design.

Course Prerequisite(s):

Differential equations and computational methods.

Course Outline:

- **Introduction**
- **Circuit Analysis**
- **Network theorems**
- **Two-port networks**
- **Filters**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. M. E. Van Valkenburg, "Network Analysis", 3rd Edition, Prentice Hall, Inc, 1974.

2. M. Arshad, "Network Analysis and Synthesis", Laxmi Publication LTD, 2006.

3. J. David Irwin, "Basic Engineering Circuit Analysis", 10th Edition, Wiley, 2010

EE472L: Numerical Methods Lab

Course Information:

Semester: II	**Unit**: UEM21	**Credit Hours:** 1.5	**Coefficient:** 1
Lecture: 0 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 1.5 hrs/week	**Semester hrs:** 18.0

Course Objectives:

This is a companion laboratory course for the Numerical methods course; the objective is to put the various methods and algorithms into computer program.

Course Prerequisite(s):

Differential equations and computational methods.

Course Outline:

- **Solving for the Roots of a function**
- **Solution of a system of linear equations:** Gauss elimination method, iterative methods..
- **Numerical integration:** trapezoidal, Coates, Newton's, Romberg….
- **Lagrange polynomial interpolation**
- **Spline interpolation**
- **Numerical solutions of differential equations:** Taylor's methods, Runge-Kutta's methods…

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

Laboratory handouts available before each Lab session.

EE416L: Antennas Lab

Course Information:

Semester: II	**Unit**: UEM21	**Credit Hours:** 2.5	**Coefficient:** 2
Lecture: 0 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 3 hrs/week	**Semester hrs:** 36.0

Course Objectives:

These laboratory antennas experiments are designed to enhance the students' skills in understanding and learning of antennas design.

Course Prerequisite(s):

Course Outline:

- **Introduction**
- **Simulation and Analysis of End Fed Microstrip Antenna**
- **Simulation and Analysis of Inset Fed Microstrip Antenna**
- **Simulation and Analysis of Proximity Fed Microstrip Antenna**
- **Simulation and Analysis of Aperture Fed Microstrip Antenna**
- **Simulation and Analysis of Microstrip Antenna Array**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. Balanis, C.A. Antenna Theory Analysis and Design, 2nd Edition. United States of America. John Wiley & Sons, pp. 734, 1997.

2. Sainati, R.A. CAD of Microstrip Antennas for Wireless Applications. Norwood, Mass. Artech House, pp. 87, 1996.

3. Laboratory Manual.

EE511: Information Theory and Coding

Course Information:

Semester: III	**Unit**: UEF31	**Credit Hours:** 4	**Coefficient:** 3
Lecture: 3 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 45.0

Course Objectives:

At the end of the course, the student will understand fundamental concepts in communication theory.

Course Outline:

Course Prerequisite(s):

- **Review of Basic Algebra (Galois Fields)**
- **Waveform Communication using Signal Space Methods**
- **Introduction to Information Theory.**
- **Source Coding**
- **Channel Coding.**
- **Introduction to Coding Theory**
- **Linear Codes**
- **Cyclic Codes**
- **Convolutional Codes**
- **Some Topics**
- **Turbo Codes**
- **Trellis codes**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. J. G. Proakis, *Digital Communications*, 5th éd. McGraw-Hill, 2008.

2. P. Lafrance, *Fundamental Concepts in Communication*. Prentice Hall, 1992

EE513: Image Processing

Course Information:

Semester: III	**Unit**: UEF31	**Credit Hours:** 4	**Coefficient:** 3
Lecture: 3 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 45.0

Course Objectives:

To provide an introduction to basic concepts and methodologies for the formation, representation, compression, enhancement and analysis of digital images.

To provide a foundation for developing applications and for further study in the field.

Course Prerequisite(s):

Algorithm and programmation.

DSP

Course Outline:

- **Introduction**
- **Filtering in time and the frequency domain**
- **Edge detection**
- **Image Segmentation**
- **Multiresolution processing/Compression**
- **Classification**
- **Applications**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1.Image Processing: The Fundamentals ,, Costas Petrou, Wiley 20102. Digital Image Processing Using MATLAB 2nd Ed. Gonzalez, Woods, and Eddins, 2009.
3. Digital Image Processing (3rd Edition) by Rafael C. Gonzalez, 2007.

4. Signal and Image Processing for Biometrics (ISTE) Amine Nait-Ali , Regis Fournier and Dalila Cherifi, Wiley 2012.

EE541: RF and Microwave Circuits Design

Course Information:

Semester: III	**Unit**: UEF32	**Credit Hours:** 6	**Coefficient:** 4
Lecture: 3 hrs/week	**Recitation:** 1.5 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 67.5

Course Objectives:

Knowledge to design microwave circuits based on active devices. Among these circuits we state narrow band microwave amplifiers, narrow band microwave oscillators and mixers. The design should be based on the use of S-parameters.

Course Prerequisite(s):

Basic understanding of RF design and analysis methods

Basic design theory of microwaves circuits

Course Outline:

- **Use of S-Parameters with Two Port-Networks**
- **Narrow Band Impedance Matching with LC Networks**
- **Microwave Filter Design**
- **Microwave Amplifier Design**
- **Microwave Oscillator Design**
- **Microwave Mixer Design**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. Gonzalez, Guillermo, "Microwave Transistor Amplifiers: Analysis and Design", Second Edition, Prentice Hall, 1997.

2. Robert E. Collin, "Foundations of Microwave Engineering", Second Edition, John Wiley, 2007.

3. Vendelin, Pavio & Rohde "Microwave Circuit design Using Linear and Nonlinear techniques", Second Edition, John Wiley; 2005.

4. Stephen A. Maas, Nonlinear Microwave and RF Circuits, 2nd Edition, Artech House, INC., 2003

EE515: Radar and Satellite Communication Systems

Course Information:

Semester: III	**Unit**: UEF32	**Credit Hours:** 4	**Coefficient:** 3
Lecture: 3 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 45.0

Course Objectives:

Knowledge of different types of radar systems and their corresponding signal processing, extracting targets information from signals embedded in noise and affected by interfering signals and clutters.

Course Prerequisite(s):

Basic notions of probability distributions, Energy Signals, Correlation and convolution, Signal waveforms and filtering, Fourier transform and Fast Fourier transform (FFT).

Course Outline:

- **Introduction to radar – Basic principles -**
- **Detection and Estimation theory**
- **Some typical radars and detection processes**
- **False alarm and detection probabilities**
- **Radar targets and clutter**
- **Signal processing of some typical radars**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. Radar Principles, Nadav Levanon, John Wiley and Sons, Inc, 1988.

2. Radar Design Principles - Signal Processing and the Environment-. Fred E. Nathanson, 2nd Ed. , McGraw-Hill Book Co.

3. Radar Systems Analysis and Design Using MATLAB, Bassem R. Mahafza, Chapman & Hall/CRC 2000.

EE521: Networks and Protocols

Course Information:

Semester: III	**Unit**: UEF32	**Credit Hours:** 4	**Coefficient:** 3
Lecture: 3 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 45.0

Course Objectives:

The goal of this course is to bring the student to understand thoroughly the network protocol mechanisms, the roles and functions of the intermediate equipments, such as routers and switches.

Course Prerequisite(s):

The student should have an insight about numbering systems, basic Boolean algebra and computer architecture.

Course Outline:

- **Network basic introduction**
- **OSI and TCP/IP Models**
- **Routing techniques**
- **Switching techniques**
- **WAN overview**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. Cisco CCNA V4.1, Exploration official course, 2011-2012

2. A. S. Tanenbaum, D. J. Wetherall, “Computer Networks, ” 5th Edition, Prentice Hall, 2010

3. G. Pujolle, “Les réseaux, ” 7th Edition, Eyrolles, 2011.

EE513L: Image Processing Lab

Course Information:

Semester: III	**Unit**: UEM31	**Credit Hours:** 1.5	**Coefficient:** 1
Lecture: 0 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 1.5 hrs/week	**Semester hrs:** 18.0

Course Objectives:

To provide practical experience in the design and implementation of image processing algorithms

Course Prerequisite(s):

Algorithm and programmation

C/C++ programming, Linux and Matlab

Course Outline:

- **Introduction**
- **Filtering in time and the frequency domain**
- **Edge detection**
- **Image Segmentation.**
- **Multiresolution processing**
- **Classification**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1.Image Processing: The Fundamentals , Maria Petrou, Costas Petrou, Wiley 2010
2. Digital Image Processing Using MATLAB 2nd Ed. Gonzalez, Woods, and Eddins, 2009.
3. Digital Image Processing (3rd Edition) by Rafael C. Gonzalez, 2007.

4. Signal and Image Processing for Biometrics (ISTE) Amine Nait-Ali , Regis Fournier and Dalila Cherifi, Wiley 2012.

EE541L: RF and Microwave Circuits Design Lab

Course Information:

Semester: III	**Unit**: UEM31	**Credit Hours:** 2.5	**Coefficient:** 2
Lecture: 0 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 3 hrs/week	**Semester hrs:** 36.0

Course Objectives:

This is an accompanying set of laboratory experiments to the design of RF and Microwave communication circuits' course. At the end of the course, the student should be able to design building blocs for microwave telecommunication circuits.

Course Prerequisite(s):

Basic understanding of RF design and analysis methods.

Basic design theory of microwaves communications circuits

Course Outline:

- **Introduction**
- **Simulation and Analysis of Microwaves Passives Filters**
- **Simulation and Analysis of Microwaves Amplifiers**
- **Simulation and Analysis of Microwaves Oscillators**
- **Simulation and Analysis of Microwaves Couplers**
- **Simulation and Analysis of Microwaves Mixers**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. G. Matthaei, L. Young, and E. M. T. Jones, Microwave Filters, Impedance-Matching Nteworks, and Coupling Structures,

2. G. Gonzalez, Microwave Transistor Amplifier, Analysis and Design.

3. G. D. Vendelin, Design of Amplifiers and Oscillators by the S-Parameter Method.

4. Laboratory Manual

EE515L: Radar and Satellite Communication Systems Lab

Course Information:

Semester: III	**Unit**: UEM31	**Credit Hours:** 1.5	**Coefficient:** 1
Lecture: 0 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 1.5 hrs/week	**Semester hrs:** 18.0

Course Objectives:

Translate radar system requirements into algorithms that work, Model and simulate radar signals and targets for different types of radars and under various conditions, Design of some typical radar simulators.

Course Prerequisite(s):

Radar basics ; Signal waveforms ; Detection and estimation theory ; Spectral analysis

Course Outline:

- **MATLAB basics**
- **Computer Data generation : Waveform, clutter and noise generation**
- **Target detection : Radar Doppler and range estimation**
- **Complex target detection**

Assessment Method: Continuous + Final Exam

Textbook(s) and/or other required material:

1. Radar Principles, Nadav Levanon, John Wiley and Sons, Inc, 1988.

2. Radar Design Principles - Signal Processing and the Environment-. Fred E. Nathanson, 2nd Ed. , McGraw-Hill Book Co.

3. Radar Systems Analysis and Design Using MATLAB, Bassem R. Mahafza, Chapman & Hall/CRC 2000.

EE521L: Networks and Protocols Lab

Course Information:

Semester: III	**Unit**: UEM31	**Credit Hours:** 2.5	**Coefficient:** 2
Lecture: 0 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 3 hrs/week	**Semester hrs:** 36.0

Course Objectives:

The goal of these series of labs is to make sure the student will grasp the concepts of LANs, sub-networking, and Protocols.

Course Prerequisite(s):

None

Course Outline:

The labs will implement performed with one of these two simulation software:

- Packet tracer V3.3.1 of Cisco Academy

- GNS 3.x

- **Introduction to Packet Tracer and GNS3**
- **Configuration of Router (s) used in a LAN**
- **Configuration of Switch (es) used in LAN (VLAN configuration).**
- **LANs interconnections (MANs or/and WANs)**

Assessment Method: Final Exam

Textbook(s) and/or other required material:

1. Cisco CCNA V4.1, Exploration official course, 2011-2012

2. A. S. Tanenbaum, D. J. Wetherall, "Computer Networks, " 5th Edition, Prentice Hall, 2010

3. G. Pujolle, "Les réseaux, " 7th Edition, Eyrolles, 2011.

EL502: Communication Skills

Course Information:

Semester: IV	**Unit**:	**Credit Hours:** 3	**Coefficient:** 2
Lecture: 3 hrs/week	**Recitation:** 0 hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 40.0

Course Objectives:

To provide samples of academic writing and appropriate practice materiel for such student and also for those students who need to write papers and reports in English

Course Prerequisite(s):

English

Course Outline:

a) Part One

- Transition from sentence production to the development of continuous prose
- Devices for linking ideas and sentences: logical, grammatical and lexical connectors
- Concepts of reference
- Paragraph Development: Producing pieces of coherent discourse
- Different types of paragraphs (analysis, description, comparison/contrast, analogy,definition ...)

b) Part Two

- Definition: Explaining what something is
- Instructions and Process: Explaining how to do something
- Description of a Mechanism: Explaining how something works
- Analysis through Classification and Partition: Putting things in order
- Analysis through Effect and Cause: Answering Why
- The Summary: Abstracting and Getting to the heart of the matter
- Using the Library: Getting acquainted with ressource materials
- Visuals: Seeing is convincing
- Report Writing: Telling it like it is
- Oral Communication: Saying it clearly
- Business Letters: Sending a Message through the mail

Assessment Method: Continuous + Examen final

Textbook(s) and/or other required material:

1. R. R. Jordan, "Academic writing course , " Harper Collins publishers 1990.

2. T. A. Sherman and S. S. Johnson "Modern Technical Writing " 5th ed, prentice hall.

EE582: Management

Course Information:

Semester: I	**Unit**:	**Credit Hours:** 3	**Coefficient:** 2
Lecture: hrs/week	**Recitation:** hrs/week	**Lab:** 0 hrs/week	**Semester hrs:** 40.0

Course Objectives:

The objectives of this course are to provide a basic acquaintance with elementary concepts of production planning and organization in order to make sound production and management decisions.

Course Prerequisite(s):

Economics Basics

Course Outline:

- **Background of production management**
- **Basic economic concepts**
- **Equipment and storage**
- **Procurement and storage**
- **Production planning and control**
- **Product design**

Assessment Method: Continuous + Examen final

Textbook(s) and/or other required material:

1. Harold Koontz and Cyril O'donnel, "Management, " 5th ed, Mc Graw Hill.
2. F. G. Moore and T. E. Henkel, , "Production/Operations Management, " 8th ed, Mc Graw Hill.