

**This document contains the documents  
relevant to the courses taught at  
BITS Pilani, Dubai Campus.**

**Any misuse of them is strictly prohibited.**

**BITS Pilani, Dubai Campus**  
**Course Handout**  
**First Year (2011-12)**

**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**First Semester 2011 – 2012**  
**Course Handout (Part – II)**

Date: 05.09.2011

In addition to part-I (General Handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

**Course No.** : MATH F111  
**Course Title** : Mathematics – I  
**Course Instructors** : Dr. K. Kumar, Ms. Kavitha Sathyanarayanan, Mr. R. Mutharasan  
**Instructor-in-charge** : Ms. Kavitha Sathyanarayanan

**Scope and Objective of the Course:**

Calculus is needed in every branch of science & engineering, as all dynamics is modeled through differential & integral equations. Functions of several variables appear more frequently in science than functions of single variable. Their derivatives are more interesting because of the different ways in which the variables can interact. Their integral occurs in several places in probability, fluid dynamics, electrical sciences, just to name a few. All lead in a natural way to functions of several variables. Mathematics of these functions is finest achievements.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:** *Given in the Catalogue 2011 – 2012 CD*

**Text Book(TB):**

Weir, Maurice D. and Others Thomas' Calculus Pearson Edu, 11th ed., 2005

**Course Plan / Schedule:**

S.No	Learning Objectives	Topics to be Covered	Chap/ Sec.No.	No. of Lectures
1	How equations of certain curve are simpler in polar coordinates	Polar-coordinates, Graphing, polar equations of conic sections, Integration	10.5 -10.8	4
2	One variable elementary calculus definitions, function, limit & continuity.	Properties of limits, infinity as a limit, continuity.	2.3, 2.4, 2.6	2
3	How definitions of one variable real valued functions are related with definitions of vector valued functions	Limit continuity & differentiability of vector function, arc length, velocity, unit tangent vector	13.1,13.3	3
4	Appreciate difficult concepts of curvature. What is curvature of a plane curve?	Curvature, Normal vector, Tangential and normal components of velocity and acceleration.	13.4, 13.5	4
5	How three different coordinates are related?	Spherical & Cylindrical Coordinates	P. 1123	1
6	How proving continuity or discontinuity or limits existence is different in several variables?	Functions of several Variables, level curve, Limits, Continuity	14.1,14.2	2
7	Difference between derivative and partial derivative	Partial derivatives Linearization, chain Rule	14.3, 14.4	2
8	Distinguish between all types of derivatives	Directional derivative, gradient vectors, Tangent planes & normal line	14.5, 14.6	3
9	Actual definition of a local Maximum & Minimum.	Maximum, Minimum & Saddle points of Functions of two or three variables, Lagrange's multipliers	14.7,14.8	3
10	How formula for area in polar coordinates can be found through polar double integral?	Double Integrals, Area, Change of integrals to Polar Coordinates.	15.1, 15.3	3
11	Try to identify which type of Integral evaluates volume of a solid in simplest	Triple Integral, Integral in Cylindrical and Spherical coordinates	15.4,15.6, 15.7	3



12	Learn equivalent definitions of conservative field & how Green's theorem can simplify evaluation of line integrals.	Line integral, work, circulation, flux, path independence, potential function, conservative field, Green's theorem in plane	16.1,16.2, 16.3, 16.4	4
13	Is Stoke's theorem analogue of Green's theorem in plane?	Surface area & Surface Integral, Gauss divergence theorem, Stoke's theorem.	16.5,16.7, 16.8	3
14	Differentiate clearly between three types of series convergence with examples & counter examples	Sequence of real numbers frequently occurring limits, infinite series different tests of convergence, series of non negative terms, absolute & conditional convergence, alternating series	11.1-11.6 11.1, 11.2 are for self study	5
15	Are we approximating functions with polynomials?	Power series, Maclaurin series, Taylor series of functions	11.7,11.8	3
Total no. of classes planned				45

**Evaluation scheme:**

EC NO	Evaluation Components	Nature of Component	Duration	Weightage	Date & Time	Venue
1	Test-I	Close Book	50 minutes	25 %	2.10.11(Sun 8.00 – 8.50)	To be announced later
2	Quiz-1	Close book	20-25 minutes	8 %	17.10.11 (Mon 8 <sup>th</sup> period)	
3	Test - 2	Open book*	50 minutes	20 %	20.11.11(Sun 8.00 – 8.50)	
4	Quiz - 2	Close book	20 – 25 minutes	7 %	1.12.11 (Th)	
5	Compre Exam	Close Book	3 hours.	40 %	3.1.12 (Tuesday 8.30am-11.30am)	

\* Only prescribed text book(s) and hand written notes are permitted

**General Instructions, Attendance & Make-up Policies, etc:** Please refer the Time Table

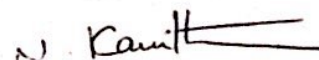
**Timings for chamber consultation:**

Students should contact the Course Instructor in his / her chamber during the CCH for consultation.

Instructor's Name	Chamber No.	Period
Dr. K. Kumar	G13	Tuesday 8 <sup>th</sup> (Section 1) and Wednesday 9 <sup>th</sup> (Section 2)
Ms Kavitha Sathyanarayanan	146	Sunday 8 <sup>th</sup> (Section 3) and Thursday 6 <sup>th</sup> (Section 5)
Mr. R. Mutharasan,	174	Monday 3 <sup>rd</sup> (Section 4) and Wednesday 6 <sup>th</sup> (Section 6)

**Notices:**

All notices will be displayed on the Notice Board of First Year.



**Ms. Kavitha Sathyanarayanan**  
Instructor – In-Charge

**Contact details:**

**Dr. K. Kumar**, Main Block, Chamber No: G13, Contact Tel. No: +9714 4200700,  
Email: [kumar@bitsdubai.com](mailto:kumar@bitsdubai.com)

**Ms. Kavitha Sathyanarayanan**, Main Block, Chamber No. 146, Contact Tel. No: +9714 4200700,  
Email: [skavitha@bitsdubai.com](mailto:skavitha@bitsdubai.com)

**Mr. R. Mutharasan**, Main Block, Chamber No. 174, Contact Tel. No: +9714 4200700,  
Email: [mutharasan@bitsdubai.com](mailto:mutharasan@bitsdubai.com)



**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**First Semester 2011 – 2012**

**Course Handout (Part – II)**

Date: 05.09.2011

In addition to Part – I (General Handout for all courses appended to the timetable) this portion gives specific details regarding the course.

**Course No** : BITS F110 (1 2 2)  
**Course Title** : Engineering Graphics  
**Course Instructor** : Dr. A.M.Surendra kumar, Mr. P.Ramesh  
**Instructor-In-charge** : Dr. A.M.Surendra kumar

**Scope and Objective of the Course:**

"Drawing is Engineer's Language". Engineering Graphics is the language for communicating, design procedures, manufacturing methodologies and allied activities among the technocrats. Computerized drafting is an upcoming technology and provides accurate and easily modifiable graphics entities, easy data storage and retrieval facility and enhances creativity. The course will provide an overview of the fundamentals of engineering drawing (constructive geometry and spatial geometry) using AutoCAD and IS convention is used. Upon successful completion of this course, the student will be able to read and interpret engineering drawings; demonstrate the proper use of AutoCAD software.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:** Given in the Catalogue 2011 – 2012 CD

**Text book(s) [TB]:** D.M.Kulkarni, A.P.Rastogi and A.K. Sarkar, **Engineering Graphics with AutoCAD**, PHI 2009.

**Reference book(s) [RB]:** i).W.J.Luzadder & Duff.J.M., **Fundamentals of Engineering Drawing**, Prentice Hall, 1993.  
 ii) Dhananjay A. Jolhe, **Engineering Drawing with an Introduction to AutoCAD**, Tata McGraw-Hill Education Private Limited, New Delhi.

**Course plan/ Schedule:**

S.No.	Learning Objectives	Topics to be covered	Lecture No.	Practical Classes	Ref. to Text Book
1	Intro to AutoCAD	Basic commands	1 - 2	2	Ch. 1 & 2
2	Orthographic projections	Theory, techniques, first and third angle projections, Multi view drawing from pictorial views.	3 - 4	2	Ch. 3 & Ch. 5
3	Isometric Drawing	Theory of isometric drawing, construction of isometric from orthographic.	5 - 6	2	Ch. 6
4	Spatial geometry	Projection of points; lines, true lengths, inclinations, shortest distance; planes	7 - 9	3	Ch. 9 & Ch. 10
5	Geometrical solids and sections	Construction of solids; section planes and sectional view.	10 - 11	2	Ch. 12 & Ch. 13
6	Development of surfaces	Radial line, parallel line	12 - 14	2	Ch. 14
7	Interpenetration of Solids	Vertical interpenetration, horizontal interpenetration, 8drawing of profile at entry and exit	15 - 16	1	Ch. 15



**Evaluation Scheme:**

EC NO	Evaluation Component	Nature of the Component	Duration	Weightage	Date & time	Venue
1	Test – 1	On-Line Closed book Examination	60 minutes	20%	To be announced later	EG lab
2	Assignments	On line Open book Class assignments	Practical Classes	40%	Regular Practical Classes	EG lab
3	Comprehensive Examination	On line Closed book Examination	90 minutes	40%	To be announced later	EG lab

**General Instructions, Attendance & Make-up Policies, etc:** Please refer the Time Table

**Timings for chamber consultation:** Students should contact the Course Instructor in his / her chamber during the CCH for consultation  
Dr.AMS ( Tuesday, 5<sup>th</sup> Hour)  
RAM (

**Notices:** All notices will be displayed on the 1 year Notice Board.

Dr. A.M.Surendra kumar  
Instructor-in-Charge

**Instructor Contact Details:**

Dr.A.M.Surendra kumar, Associate Professor, Mechanical Engineering, Main Block, Room No 163  
Contact Tel: 4200700 Ext-251, Email: [amskumar@bitsdubai.com](mailto:amskumar@bitsdubai.com)



# BITS PILANI, DUBAI CAMPUS INSTRUCTION DIVISION

First Semester 2011 – 2012

## Course Handout (Part – II)

Date: 05.09.2011

In addition to Part I (General Handout for all courses appended to the Time Table) this portion further specific details regarding the course.

Course No. : BIO F111 (3 0 3)  
Course Title : General Biology  
Course Instructors : Dr. DJ Shariff; Dr. Neeru Sood; Dr. Trupti Gokhale  
Instructor-in-charge : Dr. Trupti Gokhale

### Scope and Objective of the Course:

The objective of this course is to serve as a prelude to the biological system relating to nature, behavior and functioning of the cell. It also gives an insight into the intricate relationship of the living organism with its environment at the molecular level and consequently the impact of the modern biological findings.

Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description: Given in the Catalogue 2011 – 2012 CD

### Text book [TB]:

E.D Engner and F.C.Ross, **Concepts in Biology**, Tata McGraw Hill & Company, New Delhi, 13<sup>th</sup> edition

### Reference book(s) [RB]:

- i. P.H.Raven et al., **Biology**, WBC McGraw Hill & Co., New Delhi, 7<sup>th</sup> edition
- ii. IEL Electronic Database

### Course Plan / Schedule:

Sl.#	Learning objectives	Topics to be covered	Chapter No	No. of lectures
1	Introduction	Brief introduction to all aspects of Biology	1	2
2	Molecules of Life	Common organic molecules, Carbohydrate and Lipids, Proteins & Nucleic acids	3	2
3	Cell structure and function	Cell theory, Major cell types; Membranous and Non- membranous organelles	4	4
4	Classification & Evolution of organisms	Evolution, Classification of organisms and Viruses	20	2
5	Enzymes	Nomenclature, cellular controlling processes, Factors influencing enzyme activity	5	3
6	Biochemical pathways	Introduction to cell respiration: Glycolysis TCA cycle, ETC, Fermentation; Photosynthesis	6,7	5
7	DNA & RNA: The Molecular basis of Heredity	Central Dogma, Molecular structure of DNA DNA replication, Gene expression: Transcription and Translation, Mutation (Excluding 7.6)	8	4
8	Cell division	Cell cycle; Mitosis & Meiosis (1 & II), Abnormal cell division, Basics of Oncology.	9	4
9	Mendelian Genetics	Introduction, Inheritance patterns, Laws Solving problems on Heredity (F1, F2)	10	3
10	Recombinant DNA technology	Introduction, tools, Vectors & Endonucleases Gene cloning, Applications: Healthcare, Agriculture and Industry (Page No. 319-328&333-341)	16(RB)	4
11	Material exchange in the body	Basic Principle: Blood & circulation. Pulmonary & Systemic, Nature of blood & Human Heart; Gas exchange. Mechanism of Respiration, Digestive system, Structure & function of kidney	24	5
12	The body's control mechanisms-I	Nervous system: CNS organization; nerve impulse & synapses. Endocrine system. Sensory inputs: Eye, Ear, Skin and Tongue	26	3
13	The body's control mechanisms-II	Immune System; Defense Mechanisms- Humoral & Cell mediated immune responses. (Page No. 1013-1023 & 1027)	48(RB)	2
14	Natural selection and Evolution	Factors influencing natural selection, Hardy-Weinberg Equilibrium concept and its application	13	2
<b>Total no. of classes planned</b>				<b>45</b>



**Evaluation scheme:**

EC NO	Evaluation Components	Nature of Component	Duration	* Weightage %	Date & Time	Venue
1	Test-1	Closed Book	50 minutes	25	09.10.11 (Su) 8.00- 8.50am	To be announced later
2	Quiz-1	Closed book	20 minutes	08	24.10.11 (Monday 8 <sup>th</sup> hour)	
3	Test - 2	Open book*	50 minutes	20	04.12.11(Su) 8.00- 8.50am	
4	Quiz – 2 / Assignment	Closed book	20 minutes	07	21.11.11 (Monday 8 <sup>th</sup> hour)	
5	Compre Exam	Closed Book	3 hours	40	4.1.12 (Wednesday) 8.30am - 11.30am	

\* Only prescribed text book(s) and hand written notes are permitted

**General Instructions, Attendance & Make-up Policies, etc:** Please refer the Time Table**Timings for chamber consultation:**

Students should contact the Course Instructor in his / her chamber during the CCH for consultation.

NSS (Tuesday, 9<sup>th</sup> Hour)

DJS (Wednesday, 8<sup>th</sup> Hour)

GTS (Tuesday, 9<sup>th</sup> Hour)

**Notices:**

All notices will be displayed on the 1<sup>st</sup> year Notice Board.

Dr. Trupti Gokhale  
Instructor – In- Charge

**Instructors' Contact Details:**

Dr. Trupti Gokhale (Course Coordinator) – Main Block, Chamber No: 307A1 Contact Tel. No: 4200700  
Ext-412, email: [trupti@bitsdubai.com](mailto:trupti@bitsdubai.com) Mobile No: 050-1813394

Dr. DJ Shariff - Chamber No: G09 Contact Tel. No: 4200700 ext. 110  
Mobile No: +97150 5835786 Email: [djshariff@bitsdubai.com](mailto:djshariff@bitsdubai.com)

Dr. Neeru Sood- Main Block, Chamber No: 156, Contact Tel. No: 4200700 Ext-244;  
Mobile No: +97150 3752805 Email: [sood@bitsdubai.com](mailto:sood@bitsdubai.com)



**BITS PILANI, DUBAI CAMPUS****INSTRUCTION DIVISION****FIRST SEMESTER 2011-2012****Course Handout (Part II)**

Date: 05/09/2011

In addition to part I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

**Course No.** : BITS F112 ( 2 0 2 )  
**Course Title** : Technical Report Writing  
**Course Instructors** : Dr Shazi Shah Jabeen, Mrs. Mubeena Rahman, Dr.Lajwanti Kishnani  
**Instructor-in-charge** : Dr.Lajwanti Kishnani

**Scope and Objective of the Course**

The objective of the course is to give the student intensive practice in writing reports and other major forms of professional communication.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:** Given in the Catalogue 2011 – 2012 CD

**Text book [TB]:**

(i)Sharma, R.C. and K. Mohan. 2002. Business Correspondence and Report Writing. Fourth Edition. New Delhi: Tata McGraw Hill.

**Reference book(s) [RB]:**

(i)Lesikar, Raymond V. and Marie E. Flatley. 2003. Basic Business Communication. Ninth Edition. New Delhi: Tata McGraw Hill.

(II)Raman, Meenakshi and Sangeeta Sharma. 2004. Technical Communication: Principles and Practice. New Delhi: Oxford University Press.

**Course Plan / Schedule:**

Lec. No	Learning Objectives	Topics to be covered	Ref.Chap. /Sec. No.	No. of lectures
1	To give an insight into the communication process ,business communication and barriers	Communication Process, Barriers	Ch.1&Ch. 4	2
2	To make them cognizant of the nuances of non-verbal communication and its importance in face-to-face communication.	Non-verbal Communication	Ch.3	2
3	To make them aware of various aspects of oral presentations; to provide guidelines for effective presentations	Oral Presentation	Ch. 24	10
4	To define technical reports and tell about their characteristic features	Technical Reports	Ch 15	2
5	To introduce various types of reports; to give practice to prepare routine reports	Types of Reports	Ch. 15	4
6	To discuss various steps involved in report writing; planning and preparation: from data collection to outline making	Preparatory Steps	Ch. 17	4
7	To discuss various sources for data collection.	Sources of Data	Ch. 17	3
8	To familiarize them with all the methods of data collection	Methods of Data Collection	Ch. 17	3
9	To provide guidelines for preparing mail	Mail Questionnaire	Ch. 17	2



	questionnaire, to give adequate practice in preparing a questionnaire			
10	To introduce the elements of effective writing, what constitutes a good writing style and how can it be attained	Elements of Effective Writing	Ch. 19	1
11	To give practical hints to make one's writing more effective: choice of words, phrases, and sentences	Effective Writing-Choice of Words and Phrases	Ch. 19	1
12	To make them conscious of various aspects of writing: sentence construction, sentence length and word order	Effective Writing-Sentence Construction and Length	Ch. 19	1
13	To provide practice in effective writing	Practice	Ch. 19	2
14	To give an understanding of various structural elements of a report; to provide rigorous practice	Report Structure	Ch. 16,22 &23	2
15	To give insight into data analysis with the help of illustrations	Data Analysis & Illustrations	Ch. 20	1
16	To provide an understanding of shorter reports; when and how to use them	Memo Report & Letter Report	Cn. 23&26	2
<b>Total no. of classes planned</b>			<b>42-45</b>	

**Evaluation scheme:**

EC NO	Evaluation Components	Nature of Component	Duration	Weightage %	Date & Time	Venue
1	Test-1	Closed Book	50 minutes	20	25.09.11 (Su) 8.00-8.50am	To be announced later
2	Test - 2	Open book*	50 minutes	20	13.11.11(Su) 8.00- 8.50am	
3	Assig.I (Oral Pres.)	Closed book	5 minutes	15	TBA	
4	Assig.II(Report)	Closed book	50 minutes	10	TBA	
5	Compre Exam	Closed Book	3 hours	35	02.01.12 (Monday 8.30- 11.30am)	

\* Only prescribed text book(s) and hand written notes are permitted

**General Instructions, Attendance & Make-up Policies, etc:** Please refer the Time Table

**Timings for chamber consultation:**

Students should contact the Course Instructor in his / her chamber during the CCH for consultation.

SSJ (Tuesday, 9th Hour)

MRN (Wednesday, 2nd Hour)

LAS (Tuesday, 5<sup>th</sup> Hour)

**Notices:**

All notices will be displayed on the 1<sup>st</sup> year Notice Board.

*Shazi Shah Jabeen* *Lajwanti Kishnani*  
 Dr. Lajwanti Kishnani  
 Instructor – In- Charge

**Instructors' Contact Details:**

Dr. Shazi Shah Jabeen- Wing A, Chamber No: 128, Contact Tel. No: 4200700 Ext-219;  
 Mobile No: +97150 3568318 Email: [shazi@bitsdubai.com](mailto:shazi@bitsdubai.com)

Dr. Lajwanti Kishnani- Wing B, Chamber No: 233 Contact Tel. No: 4200700 Ext. 316  
 Mobile No: +97155 4058889 Email: [lajwanti@bitsdubai.com](mailto:lajwanti@bitsdubai.com)

Ms. Mubeena Rahman –Wing B, Chamber No. 176,Contact Tel.no: 4200700 Ext .261  
 Mobile No: +971503545745 Email: [mubeena@bitsdubai.com](mailto:mubeena@bitsdubai.com)



# BITS PILANI, DUBAI CAMPUS

## INSTRUCTION DIVISION

First Semester 2011 – 2012

### Course Handout (Part – II)

Date: 05.09.2011

In addition to Part I (General Handout for all courses appended to the Time Table) this portion gives further specific details regarding the course.

**Course No.** : PHY F111 (3 0 3)  
**Course Title** : Mechanics, Oscillations and Waves  
**Course Instructors** : Dr. R.Roop Kumar ; Dr. K.K.Singh  
**Instructor-in-charge** : Dr. R.Roop Kumar

#### Scope and Objective of the Course:

The objective of this course is to serve as a prelude to core level physics to be taught to all science and engineering students. It deals with topics on Mechanics, Oscillations and Waves paving a strong platform for the basic understanding of concepts and origins of Mechanics, Oscillations and waves and to relate to engineering subjects. It also aims to acquire a confidence building knowledge base of solved problems in various topics that acts as a springboard for more advanced work related to their specialization in Engineering courses.

Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description: Given in the Catalogue 2011 – 2012 CD

#### Text book [TB]:

- (i) Daniel Kleppner and R.J. Kolenkow, An Introduction to Mechanics, Tata McGraw-Hill, 1999.
- (ii) A. P. French. Vibrations and Waves, CBS 1987

#### Reference book(s) [RB]:

Robert Resnick, David Halliday and Kenneth S. Krane, Physics, Vol.1 & 2, Fifth edition, John Wiley & Sons, Inc., 2001.

#### Course Plan / Schedule:

S.No	Learning Objectives	Topics to be covered	Chapter Nos	No of Lectures
<b>From "An Introduction to Mechanics "</b>				
1.	Introduction	Vectors and Galilean Transformation	Chapter I & Class Notes	3
2.	Newton's Laws and Applications	Newton's laws, Standards and Units, Applications of Newton's laws, Everyday forces of Physics	2.1-2.5 <i>Exclude</i> : eg: 2.16-2.18 and Note 2.1	6
3.	Momentum	Dynamics of system of particles, Conservation of momentum, Impulse and a restatement of the momentum relation, Momentum and Flow of mass	3.1-3.6.	6
4.	Work and Energy	Work- Energy Theorem, Applying Work-Energy Theorem, Potential Energy , Energy Diagrams, Non Conservative Forces, Conservation Laws and Collisions	4.1-4.9, 4.11-4.14 <i>Exclude</i> : Sec 4.10, eg: 4.2,4.8,4.9 and 4.10	8
5.	Angular Momentum and Fixed Axis Rotation	Angular momentum of a particle, Torque, Angular Momentum and Fixed Axis Rotation, Dynamics of pure rotation about an axis, Motion involving translation and rotation	6.1-6.7. <i>Exclude</i> : Note: 6.1,6.2 and eg: 6.3, 6.4, and 6.11	6
6.	The Harmonic Oscillator	Damped Harmonic Oscillator, Forced Harmonic Oscillator, Response in time versus Response in frequency, etc.,	10.1-10.4 eg:2.16-2.18, 4.2	6
<b>From " Vibrations and Waves"</b>				
7.	Progressive Waves	Waves, Normal modes and traveling waves, Progressive waves in one direction, Wave speeds in specific media, Superposition, Dispersion (phase and group velocities), Energy in a mechanical wave, transport of energy by a wave	Pg 201-215, 230-234, 237-242	5
8.	Boundary effects and interference	Double slit interference, Multiple slit interference (Diffraction grating), Diffraction by a single slit, Interference patterns of real slit	Pg 280–298	5
<b>Total Number of classes planned</b>				<b>45</b>



**Evaluation Scheme:**

EC NO	Evaluation Components	Nature of Component	Duration	Weightage %	Date & Time	Venue
1	Test-I	Closed Book	50 minutes	25	16/10/2011 (Sunday 8.00-8.50am)	To be announced later
2	Quiz 1	Closed book	20 minutes	08	31/10/2011 (Monday 8 <sup>th</sup> hour)	
3	Test - 2	Open book*	50 minutes	20	11/12/2011 (Sunday 8.00-8.50am)	
4	Quiz 2	Closed Book	15 minutes	07	28/11/2011 (Monday 8 <sup>th</sup> hour)	
5	Comprehensive Exam	Closed Book	3 hours.	40	07/01/2012 (Saturday 8.30am-11.30am)	

\* Only prescribed text books and handwritten notes are permitted.


**General Instructions, Attendance and Make-up policies, etc :** *Please refer the time table*

**Timings for chamber consultation:**

Students should contact the Course Instructor in his / her chamber during the CCH for consultation.  
RRK - Thursday, 5<sup>th</sup> Hour (Sec I) and Wednesday 2<sup>nd</sup> Hour (Sec V)  
KKS - Wednesday, 2<sup>nd</sup> Hour (Sec III)

**Notices:**

All notices will be displayed on the 1<sup>st</sup> year Notice Board .

  
**Dr. R. Roop Kumar**  
Instructor - in- charge

**Instructors' Contact Details :**

Dr. R. Roop Kumar, Professor, (Course Coordinator) Room No.125, Contact No: +97150-2289783,  
e-mail: [roopkumar@bitsdubai.com](mailto:roopkumar@bitsdubai.com)

Dr. K K. Singh, Associate Professor, Room No. 157, Contact No: +97150-8668797,  
e-mail: [singh@bitsdubai.com](mailto:singh@bitsdubai.com)



# BITS PILANI, DUBAI CAMPUS INSTRUCTION DIVISION

First Semester 2011 – 2012

## Course Handout (Part – II)

In addition to Part I (General Handout for all courses appended to the Time Table) this portion further specific details regarding the course. Date: 05.09.2011

Course No. : CHEM F110 (0 4 2)  
Course Title : Chemistry Laboratory  
Course Instructors : Dr. F. Rusal Raj, Dr. Vijaya Ilango, Dr. Geetha, Dr. R. Rajan  
Instructor-in-charge : Dr. F. Rusal Raj

**Scope and Objective of the Course:** Chemistry laboratory course imparts practical knowledge of the branches of chemistry to the first year students.

- To guide and motivate the students to learn various aspects related to the experiments along with the specific methodology in chemistry.
- To illustrate the theory behind the selected experiments for the better appreciation of the concepts involved.
- To illustrate integration of different concepts taught in the theory classes.
- To train the students to develop the skills in handling and operating scientific instruments with confidence and to get an idea of various orders of magnitude of the quantities measured.
- To train the students in systematic acquisition and analysis of the data and their quantitative interpretations

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:** Given in the Catalogue 2011 – 2012 CD

**Reference book(s) [RB]:**

- (i) Instruction Manual provided in the laboratory.
- (ii) Measurement technique, Notes – ed. by Gupta A. et al.
- (iii) R.T. Morrison and R. Boyd, Organic Chemistry, PHI, Sixth Edition, 1992.
- (iv) Practical Chemistry, V.Venkateswaran, Sultan Chand & Sons, 2007.

**Course Plan / Schedule:**

S.No	Topics to be covered	Learning objectives	No. of lab sessions
1	A general description of experiments to be carried out during the semester and safety guidelines & precautions to be taken in the Chemistry laboratory	Orientation	
2	Qualitative Identification of Organic compounds	Identification of Carboxylic acid group & Carbohydrates	
3	Rate of Reaction	Determination of rate constant for acid catalyzed hydrolysis of ester	
4	Conductance measurements of electrolytic solutions	Verification of Ostwald's dilution law	
5	Potentiometric titration	Determination of ionization constant of a weak acid	
6	Redox titration	Quantitative determination of a given $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ solution	
7	Preparation of Acetanilide	Provide experience in synthesis of organic compounds	
8	Preparation of Benzoic Acid	Provide experience in synthesis of organic compounds	
10	Verification of Onsager Equation and determination of Equivalent Conductance of a strong electrolyte	To determine equivalent conductance of a strong electrolyte.	
11	pH metric titration of strong acid Vs strong base.	To estimate the amount of strong acid.	



12	Potentiometric Redox titration	To estimate the amount of ferrous sulphate by potentiometric method.	
13	Separation of Mixtures	To separate the substances from a mixture using solvents.	

**Evaluation scheme:**

Component	Duration	Weightage (%)	Days & Time	Venue
Day-to-day performance	2 Lecture Hours / session	60	<u>Sec: 1</u> Mon: 2 & 3. Tue: 2 & 3. Thu: 8 & 9 <u>Sec: 3</u> Sun: 5 & 6. Tue: 4 & 5. Wed: 8 & 9. <u>Sec: 5</u> Sun: 3 & 4. Mon: 4 & 5. Wed: 4 & 5	MT-1 Chemistry-Lab.
Compre. Exam	2 hours	40	To be announced	To be announced

**Note:** If a student is absent throughout/gets zero in all the laboratory oriented components, he/she will get NC report, irrespective of marks obtained in other components.

**Details**

- There will be 12 Experiments to be performed Chemistry laboratory. Details of the experiments will be available in the lab manual.
- The comprehensive examination will be conducted at the end of the course. Each experiment performed in the lab will be evaluated out of 10 marks based on the following:
 

Attendance & participation	:	2 marks
Results & Calculations	:	4 marks
Viva-voce (written)	:	4 marks
- Students are required to submit the completed record of the experiment for evaluation on the very next turn or else 2 marks will be deducted for late submission.

**Note:** It shall be the responsibility of the students to maintain regularity in the labs.

**General Instructions, Attendance & Make-up Policies, etc:** Please refer the Time Table

**Timings for chamber consultation:** Students are advised to meet personally for any course related clarifications during allotted chamber hours (to be announced in class) OR by fixing a suitable appointment based on mutual convenience of both student and the instructor.

**Notices:** All notices will be displayed on the First year Notice Board.

  
Instructor-in-Charge

**Instructors' Contact Details:**

Dr. F. Rusal Raj. (Instructor-in-Charge); Main Block, Chamber No: 306A. Contact Tel. No: 4200700; Ext-410. e-mail: [rusalraj@bitsdubai.com](mailto:rusalraj@bitsdubai.com)  
 Dr. Vijaya Ilango, Main Block, Chamber No: 139. Contact Tel. No: 4200700; Ext-230  
 e-mail: [vilango@bitsdubai.com](mailto:vilango@bitsdubai.com)  
 Dr. Geetha Chamber No: 237; Contact Tel. No: 4200700; Ext-319.  
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 Dr. R. Rajan Chamber No: 136 Contact Tel. No: 4200700; Ext-227.  
 e-mail: [rajan@bitsdubai.com](mailto:rajan@bitsdubai.com)



# BITS PILANI, DUBAI CAMPUS INSTRUCTION DIVISION

First Semester 2011-12

## Course Handout (Part – II)

Date: 03.09.2011

In addition to Part I (General Handout for all courses appended to the Time Table) this portion further specific details regarding the course.

**Course No.** : PHY F110  
**Course Title** : Physics Laboratory  
**Instructor-in-charge** : Dr. K. K. Singh  
**Course Instructors** : Dr. R. Roop Kumar, Dr. Karthiyayini, Dr. K. K. Singh, Dr. Neeru Bhagat, Dr. Kavita Jerath and Dr. G. Amaranath

### Scope and Objective of the Course:

Physics lab is a one semester comprehensive course on core level physics to be taught to all engineering students in their second year. It deals with practical knowledge of equipments required in experiments dealing with Mechanics, Waves, Optics, Electricity, Magnetism and Elements of Modern Physics.

The objective of the course is

- To expose the students to some of the important experiments associated with the Core Science courses.
- To illustrate the theory behind the selected experiments for the better appreciation of the concepts involved.
- To guide and motivate the students to learn various aspects related to the experiments along with the specific methodology of the experiments.
- To illustrate integration of different concepts taught in the theory classes.
- To train the students to develop the skills in handling and operating scientific instruments with confidence and to get an idea of various orders of magnitude of the quantities measured.
- To train the students in systematic acquisition and analysis of the data and their quantitative interpretations.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:** Given in the Catalogue 2011-12 CD

### Text book(s) [TB]

- i. Instruction Manual provided in the laboratory.
- ii. General Book of College Physics and Viva-Voce

### Reference book(s) [RB]:

i. "PHYSICS", Vol. 1 & 2, David Halliday, Robert Resnick and Kenneth S. Krane, Fifth edition, John Wiley & Sons, Inc., 2002.

### Course Plan / Schedule:

S.No	Topics to be covered	Learning objectives	Ref. to Text Book	No. of lectures
	Orientation	A general description of experiments to be carried out during the semester and precautions to be taken in the lab		1
1	Specific Charge of an electron	Moving charges in magnetic field. Accelerating a charged particle. Magnetic field due to a current carrying conductor (coil and solenoid)		1
2	Planck's Constant by Photoelectric Effect	Photoelectric Effect. Properties of a diffraction grating.		1
3	Single and Double Slit Diffraction	Diffraction concepts.		1
4	Induction of Solenoids	Induction concepts. Basics of LC oscillations. Concepts of CRO.		1
5	Electron Diffraction	X-ray Diffraction over crystals. Matter waves. Bragg's law.		1
6	Fine Structure of one-electron spectrum	Spectral lamps, energy levels, diffraction grating (Resolving power and dispersion)		1
7	Vibrations of strings	Standing waves, waves on strings, resonance.		1



8	RLC circuits	Oscillations in electric circuits, forced damped oscillations in electric circuits, resonance, Quality factor.	1
9	Ferromagnetic Hysteresis	Concepts of magnetism, magnetic field due to solenoid. Significance of hysteresis.	1
10	Hall Effect in n-Germanium	Hall effect concepts and applications, motion of charged particles in cross fields.	1
11	Characteristics of Solar Cell	Concepts of semiconductors, pn junction, Fermi level.	1
12	Laws of Elastic Collisions	Collisions theory (elastic and inelastic)	1
<b>Total number of classes planned: 13</b>			

#### Evaluation scheme:

Evaluation Component	Duration	Marks(Total 200)	Weight age (%)	Days & Time	Venue
Day-to-day performance	2 lecture hours per session	120	60	Sec 1,3,5 As per the time table	Physics Laboratory
Compre. Exam	2 hours	80	40	To be announced later	To be announced later

#### Details

- There will be 12 experiments to be performed in Physics Lab. Details of the experiments will be available in the lab manual.
- The comprehensive written test will be based on the experiments performed in the lab. The test will be subjective (short answer)/ objective type.
- Each experiment performed in the lab. Will be evaluated out of 10 marks based on the following considerations:
 

Attendance and Participation	<b>2 marks</b>
Results and Calculations	<b>4 marks</b>
Viva (written)	<b>4 marks</b>
- Students are required to submit the completed record of the performed experiment for evaluation on the very next turn which will be retained by the concerned faculty. Participation will be confirmed only after submission of observation table duly signed by faculty or lab instructor. **2 marks** will be deducted each turn for late submission of the practical record of the experiment.

**Note:** As the schedule of the experiments is very tight, it shall be the responsibility of the students to maintain regularity in the labs.

**General Instructions, Attendance & Make-up Policies, etc:** Please refer the Time Table

**Timings for chamber consultation:** Students should contact the Course Instructor in his / her chamber for consultation.

**Notices:** All notices will be displayed on the 1st Year/ Physics Laboratory Notice Board.

Instructor-in-Charge

Dr. K. K. Singh

#### Instructors' Contact Details:

Dr. R. Roop Kumar, Professor, Room No.125, Contact No: +97150-2289783, e-mail: <a href="mailto:roopkumar@bitsdubai.com">roopkumar@bitsdubai.com</a>
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Dr. K. K. Singh, Associate Professor (Course Coordinator), Room No. 157, Contact No: +97150-8668797, e-mail: <a href="mailto:singh@bitsdubai.com">singh@bitsdubai.com</a>
Dr. Neeru Bhagat, Associate Professor, Room No.129, Contact No: +97150-6944086, e-mail: <a href="mailto:neeru@bitsdubai.com">neeru@bitsdubai.com</a>
Dr. Kavitha Jerath, Associate Professor, Room No.144, Contact No: +97150-1563324, e-mail: <a href="mailto:kavitha@bitsdubai.com">kavitha@bitsdubai.com</a>
Dr. Amarnath, Assistant Professor, Room No. 309A2, Contact No: +97155-4905525, e-mail: <a href="mailto:amaranath@bitsdubai.com">amaranath@bitsdubai.com</a>



# BITS PILANI, DUBAI CAMPUS

## INSTRUCTION DIVISION

Second Semester 2011 - 2012  
Course Handout – (Part II)

Date: 1.02.2012

In addition to Part I (General Handout for all courses appended to the time table) this document gives further details regarding the course.

Course No. : CS F111 (3 0 3)

Course Title : Computer Programming

Course Instructors (Theory): Ms. S.Susila, Ms. J. Alamelu Mangai, Ms.Susanna S Henry, Mr.Nand kumar  
 Instructor-in-charge(Theory): Ms.S.Susila

Instructors (Practicals): Dr. B.Vijayakumar, Dr. M. Madijagan, Ms.Jeyalatha, Ms. J. Alamelu Mangai

### Scope and Objectives of the Course:

This course starts with basic building blocks required to understand the structure of a computer: numbers, bits, structures to implement operations on numbers, and structures to control the execution of commands by a computer. The course progresses to introduce high level abstractions such as an operating system and a high level language. The course concludes with the introduction of programming as a framework for problem solving: program constructs as tools for problem solving and programming techniques as strategies for problem solving.

Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description: Given in the Catalogue 2011 – 20112 CD

### Text Book(s) [TB]

T1. J.R. Hanly and E.B. Koffman, Problem Solving and Program Design in C. 5<sup>th</sup> Ed. Pearson Edu '07.

### Reference Books [RB]

R1. R.J. Dromey, Problem Solving using Computer. Prentice Hall India. Eastern Economy Ed.. '02.

R2. Brian W. Kernighan, Dennis Ritchie. The C Programming Language. Prentice Hall. 2<sup>nd</sup> Ed.

### Course Plan / Schedule:

S. #	Learning Objective	Topic	Reference	No of Lectures
1		Basics of Computing – Data and Computation. Model of a computer. Problem Solving	-	1
2	To understand how to define and process basic data (numbers).	Data Types - Operations and Representation – Numbers – Integers and Integer Operations Character representation	T1 Sec. 2.5, 7.1, Class Notes	3
3		Memory and Variables – Locations, Addresses, Definitions and Declarations	T1 Sec. 2.2, Class Notes	2
4		Data Types – Boolean Values and Boolean Operations; Operations; – Characters and Character Sets;	T1 Sec. 7.2, Class Notes	1
5		Expression Evaluation – Associativity and Precedence Conditional Expression	T1 Sec. 2.5	1
6		Variables and Assignment – Forms of Assignment (Increment/Decrement). Sequencing.	T1 Sec. 2.3, 2.5	1
7	To understand different use of memory in programming.	Data Types –Real numbers vs. Rational Numbers; Accuracy, Precision, and Range Floating Point Representation, Single and Double Precision	Class Notes	2
8		Data Types – Type Conversion – Implicit and Explicit	T1 Sec. 7.1	1
9		Basics of Input / Output – Character and Buffered I/O. External Interface for the Program – Compilation and Execution	T1 Sec. 2.6, 2.7	1
10	To understand constructs of structured programming including conditionals and iterations	Functions (Basics) and Program Structure	T1 Sec. 3.1, 3.4, 3.5	1
11		Problem Solving – Sequential and Conditional Execution; FlowCharts, Pre-conditions and Post-conditions. Statements – Sequential and Conditional Statements. User Defined Data – Enumerated Data Types.	T1 Sec. 4.1 to 4.5	2
12		Problem Solving – Repetitive Execution – Bounded, Unbounded, and Infinite Iterations; Flow Charts – Entry and Exit, Correctness Arguments – Invariance and Termination. Forms of Iterative Statements;	T1 Sec. 5.1 to 5.8	3
13		goto Statements – Structured Programming	Class Notes	1



14		Data Types – Structured Data - Lists – Random Access and Locality – Indexing; Iterating over lists – Ordering and Searching; Character Arrays and Strings;	T1 Sec. 8.1 to 8.4, Sec. 9.1 to 9.4	4
15	To understand how to structure complex data and how to systematically structure large programs	Problem Solving – Modularity and Reuse – Procedures and Functions – Types - Parameters and Arguments – Local data vs. Non-local data – Composition of Functions	T1 Sec. 6.1 to 6.4	4
16		Data Types – Tuples and Choices – Representation and Access ; Multiple Lists vs Lists of Tuples;	T1 Sec. 11.1 to 11.3	2
17		User Defined Data Types – Abstract Data Types – Structure and Implementation of ADTs - Examples (Access Restricted Lists)	T1 Sec. 13.1 to 13.3, Class Notes	1
18		Memory Layout – Implicit vs. Explicit Allocation; Static vs. Semistatic vs. Dynamic Allocation; Motivation for Dynamic Allocation – Cursors and Pointers. Dynamically allocated Lists. – Dynamic Arrays and Linked Lists - Operations. Examples	T1 Sec. 14.2 – 14.6	4
19	To understand how users can define the structure and operations of new forms of data using known forms	Pointers, Addresses and Address Arithmetic; Parameter Passing – By Value and By Reference. Multiple levels of Indirection.	T1 Sec. 14.1	4
20		Files and File I/O: External Storage, Files and File Systems, File Operations and I/O Operations;	T1 Sec. 12.1	3
21		Divide and Conquer – Design using Recursion; Recursive procedures; Recursion vs. Iteration – Time and Space. Tail Recursion	T1. Sec. 10.1 to 10.5	1
22		Course Summary	-	2

Total Number of classes planned: 45

#### CP practical:

The following topics are covered in the lab.

S.#	Topics
1	Input and output statement in C
2	Using different data types and operators in C
3	Different programming structures (selective structures, iterative structures)
4	Using arrays in C (Single dimensional, multi dimensional)
5	String processing
6	Structures and unions
7	functions
8	Pointers
9	File handling
10	Dynamic memory allocation and linked list

#### 8. Evaluation scheme:

EC NO	Evaluation Components	Nature of Component	Duration	Weightage	Date & Time	Venue
1	Test-I	Closed Book	50 minutes	25 %	26.02.12(SU)	To be announced later
2	Quiz-1	Closed book	20-25 minutes	05 %	21.03.12	
3	Test - 2	Open book*	50 minutes	20 %	12.04.12(TH)	
4	Lab test & Journal	Closed Book	50 minutes	10%	To be announced	
5	Compre Exam	Closed Book	3 hours.	40 %	3.6.12 (SU) (FN)	

- Only prescribed text book(s) and hand written notes are permitted

**General Instructions, Attendance & Make-up Policies, etc:** Please refer the Time Table

**Timings for chamber consultation:** Students should contact the Course Instructor in his / her chamber during CCH for consultation.

**Notices:** All notices will be displayed on the 1st year Notice Board.

S. SUSILA

Instructor-in-Charge

**Instructors' Contact Details:** Mrs. S. Susila, Chamber No: 302 A1 (MT-II EEE Lab.), Contact Tel. No: +97143744286 / 289 Ext. 402, Email: [susila@bits-dubai.ac.ae](mailto:susila@bits-dubai.ac.ae),  
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**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**Second Semester 2011 – 2012**  
**Course Handout (Part – II)**

Date: 01.02.2012

In addition to part - I (General Handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

Course No. : MATH F112 / MATH C192  
 Course Title : Mathematics – II  
 Course Instructors : Dr. K. Kumar, Dr. Suhel Ahmed Khan, Ms. S. Kavitha  
 Instructor-in-charge : Ms. S. Kavitha

**Scope and Objective of the Course:**

The course is meant as an introduction to Linear Algebra and Theory of Complex Variable Functions and their applications. Students are encouraged to study MATLAB's capabilities for solving linear algebra problems given in the Text Book.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:** Given in the Catalogue 2011 – 2012 CD

**Text Books:**

- (a) Elementary Linear Algebra by S. Andrilli and D. Hecker, (3<sup>rd</sup> edition) 2006, Elsevier.  
 (b) Complex Variables and applications by R.V. Churchill and J.W. Brown, 8<sup>th</sup> edition, 2008, McGraw-Hill.

**Reference Books:**

- (a) Linear Algebra: A First Course with Applications by Larry E. Knop, 1<sup>st</sup> Edition, 2008, Chapman & Hall.  
 (b) A Modern Introduction to Linear Algebra by Henry Ricardo, 1<sup>st</sup> Edition, 2009, Chapman & Hall.  
 (c) Introduction to Linear Algebra by G. Strang, 4<sup>th</sup> edition, 2009, Cambridge Press.  
 (d) Complex Variables with Applications by A.D. Wunsch, 3<sup>rd</sup> edition, Pearson Education.  
 (e) A first course in Complex Analysis with Applications by D. G. Zill and P.D. Shanahan, 2<sup>nd</sup> Edition, Jones and Bartlett, 2010.

**Course Plan / Schedule:**

Serial No.	Learning Objectives	Topics to be covered	Sec. No. of Text Book	Lecture No.
<b>A. Linear Algebra</b>				
1	Solving system of linear equations.	Solutions of linear systems of equations by Gauss Elimination, Gauss-Jordan, RREF, Rank, Inverse of Matrices	2.1- 2.4	4
2	Introduction to abstract vector spaces, finite and infinite dimensional vector spaces and related concepts.	Vector spaces, subspaces, linear independence, basis and dimension. Rank and inverse of a matrix and applications. Coordinates and change of basis.	4.1-4.7	8
3	Introduction to linear transformations, examples of linear transformations, Understanding the link between linear transformations and matrices.	Definition and examples, kernel and range of linear transformation. The matrix of a linear transformation, Composite and invertible linear transformations.	5.1-5.4	6
4	Computing eigenvalues and eigenvectors.	Eigenvalues and eigenvectors.	3.4	2
<b>B. Complex Variables</b>				
5	Revising the knowledge of complex numbers.	Review	1-10	2
6	Evaluation of limit of functions of complex variables at a point. Testing continuity of such functions.	Functions of a complex variable. Limit and continuity	11,14-17	1
7	Introduction to analytic functions. Finding out singular point of a function.	Derivative, CR-equations, analytic functions.	18-23, 25	3
8	Study of elementary functions.	Exponential, trigonometric and	28-35	4



	These functions occur frequently all through the complex variable theory. Understanding Multiple Valued Function, branch cut branch point	hyperbolic functions. Logarithmic functions, complex exponents, inverse functions.		
9	Integrating along a curve in complex plane.	Contour integrals, anti-derivatives.	36-41	2
10	Learning techniques to find integrals over particular contours of different functions.	Cauchy-Goursat Theorem, Cauchy Integral Formula, Morera's Theorem.	42-44, 46-48	4
11	To study application of complex variable theory to algebra.	Liouville's Theorem, Fundamental Theorem of Algebra.	49,50	1
12	Series expansion of a function analytic in an annular domain. To study different types of singular points.	Laurent series.	55,56	2
13	Calculating residues at isolated singular points.	Residues, Residue Theorem.	62-69	3
14	To study application of complex integration to improper real integral.	Improper real integrals.	71-74, 78	3
	Total number of lectures			45

**Evaluation scheme:**

EC No.	Evaluation Components	Nature of Component	Duration	Weightage	Date & Time	Venue
1	Test-I	Close Book	50 minutes	25 %	04.03.2012 (8.00am - 8.50am)	To be announced later
2	Quiz-1	Close book	20-25 minutes	8 %	28.03.2012 (2.15pm - 2.35pm)	
3	Test - 2	Open book*	50 minutes	20 %	22.04.2012 (8.00am - 8.50am)	
4	Quiz - 2	Close book	20 - 25 minutes	7 %	16.05.2012 (2.15pm - 2.35pm)	
5	Compre Exam	Close Book	3 hours	40 %	05.06.2012 (8.30am-11.30am)	

\* Only prescribed text book(s) and hand written notes are permitted

**General Instructions, Attendance & Make-up Policies, etc:** Please refer the Time Table.

**Timings for chamber consultation:**

Students should contact the Course Instructor in his / her chamber during the CCH (Monday 9<sup>th</sup> Period) for consultation.

**Notices:**

All notices will be displayed on the Notice Board of First Year.

  
Ms. S. Kavitha  
Instructor-In-Charge

**Contact details:**

**Dr. K. Kumar**, Main Block, Chamber No: G13, Contact Tel. No: +9714 4200700, Ext:114,  
Email: [kumar@bits-dubai.ac.ae](mailto:kumar@bits-dubai.ac.ae)

**Dr. Suhel Ahmed Khan**, Main Block, Chamber No. 130, Contact Tel. No: +9714 4200700,  
Ext:221, Email: [sakhan@bits-dubai.ac.ae](mailto:sakhan@bits-dubai.ac.ae)

**Ms. S. Kavitha**, Main Block, Chamber No. 146, Contact Tel. No: +9714 4200700, Ext: 235,  
Email: [skavitha@bits-dubai.ac.ae](mailto:skavitha@bits-dubai.ac.ae)



**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**Second Semester 2011 – 2012**  
**Course Handout (Part – II)**

Date: 01.02.2012

In addition to Part I (General Handout for all courses appended to the Time Table) this portion further specific details regarding the course.

**Course No.** : MATH F113 (3 0 3)  
**Title** : Probability and Statistics  
**Instructor(s)** : Dr. Maneesha Bhagchandani and Mr. R Mutharasan  
**Instructor-in-charge** : Dr. Maneesha Bhagchandani

**Scope and Objective of the Course:**

Probability theory deals with chance phenomena and has clearly links with the real world. Interpretation of much of the research in the engineering and computing sciences increasingly depends on concept of probability and statistics that familiarize the student with the computational aspects of probability and the handling of data sets to one of a more theoretical nature.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:** Given in the Catalogue 2011 – 2012 CD

**Text book [TB]:**

J.S. Milton and J.C. Arnold, "Introduction to Probability and Statistics -Principles and applications for engineering and the computing sciences", Tata McGraw-Hill, Fourth Edition, 2007.

**Reference book(s) [RB]:**

Meyer, P.L., Introductory Probability and Statistical Applications (Oxford & IBH), 2<sup>nd</sup> Edition, 1970.

**Course Plan/Schedule:**

S. No.	Learning Objectives	Topics to be covered	Chapter Nos.[TB]	No. of Lectures
1	Introduction to probability and counting	Interpreting probabilities, sample spaces, events, permutation and combinations	1.1-1.3	1
2	Axioms of probability, Properties, Bayes Theorem	Axioms of probability, conditional probability, Independence and the multiplication rule, Bayes Theorem	2.1, 2.2, 2.3, 2.4	3
3	Discrete random variables and distributions	Random variable, discrete probability densities, cumulative distribution, Expectation, variance and standard deviation, Moment generating function	3.1, 3.2, 3.3, 3.4	3
4	Some special discrete distributions	Binomial distribution, Hyper geometric distribution	3.5, 3.7	2
5	Poisson distribution and properties	Poisson Distribution	3.8	2
6	Continuous distributions and properties with some special distributions	Continuous densities and cumulative distribution, expectation and distribution parameters, Uniform distribution, gamma distribution, chi square distribution, Exponential distribution	4.1, 4.2, 4.3	5
7	Normal and Weibull distributions with Chebyshev's inequality	Normal distribution and standard normal distribution, Chebyshev's inequality, normal approximation, Weibull distribution (Omit reliability)	4.4, 4.5, 4.6, 4.7	5
8	Joint distributions	Joint densities and independence, marginal distribution: discrete and continuous, expectation, conditional densities (omit regression)	5.1, 5.2, 5.4	3
9	Simulation	Simulating a discrete distribution and continuous distribution	3.9, 4.9	2



10	Estimation	Estimation	7.1-7.4	3
11	Interval estimation and hypothesis testing	Interval Estimation of variability, Estimating the mean and Student-t distribution, Hypothesis testing, Hypothesis Tests on the mean, Hypothesis tests on the variance	8.1-8.6	5
12	Inference on proportions	Inference on proportions	9.1-9.4	3
13	Parameter Estimation, Properties of least-squares estimators, Correlation	Model and Parameter Estimation, Properties of least-squares estimators, Confidence interval estimation and hypothesis testing, Correlation	11.1-11.3, 11.6	4
14	Regression	Multiple Linear Regression Models	12.1-12.8	4
Total no. of classes planned				45

#### Evaluation Scheme:

EC No	Evaluation Component s	Nature of Component	Duration	Weightage %	Date & Time	Venu e
1	Test-I	Close Book	50 minutes	25	22.03.12(Th) 8.00 – 8.50 a.m.	To be announced later
2	Quiz-1	Close book	20 minutes	08	29.02.12(W/B)	
3	Test - 2	Open book*	50 minutes	20	13.05.12(Su) 8.00 – 8.50 a.m.	
4	Quiz - 2	Close book	20 minutes	07	18.04.12(W/B)	
5	Compre Exam	Close Book	3 hours	40	12.06.12 (Tuesday FN)	

\* Only prescribed text book(s) and hand written notes are permitted

#### General Instructions, Attendance & Make-up Policies, etc: Please refer the Time Table

#### Timings for chamber consultation:

Students should contact the Course Instructor in his / her chamber during the CCH for consultation.

MBC (Sec-3: Tuesday, 6<sup>th</sup> hour)

MUT (Sec-1: Tuesday, 6<sup>th</sup> hour, Sec 5:Wed 3<sup>rd</sup> hour)

#### Notices:

All notices will be displayed on the 1<sup>st</sup> year Notice Board.

*Bhagchandani*  
1/02/2012  
Instructor-in-Charge  
(MATH F113)

#### Contact details:

Dr. Maneesha Bhagchandani – Main Block, Chamber No: 138, Contact Tel. No:4200700 Ext-229,

email. maneeshab@bitsdubai.com

Mr. R. Mutharasan – Main Block, Chamber No: 174, Contact Tel. No: 4200700 Ext-259

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# BITS PILANI, DUBAI CAMPUS

## INSTRUCTION DIVISION

Second Semester 2011 – 2012

### Course Handout (Part – II)

Date: 01.02.2012

In addition to Part-I (General Handout for all courses appended to the timetable) this portion gives specific details regarding the course.

Course No. : ME F 110 (0 4 2)  
Course Title : Workshop Practice  
Course Instructors : Mr. D. Purushothaman; Mr. D.Gopinath  
Instructor-in-charge : Dr. R.Karthikeyan

#### Course description:

Laboratory exercises involving machining, fitting and joining processes. Casting; metal forming; forging, welding and brazing; metal cutting machines e.g., lathe shaper and planer; drilling milling and grinding;

#### Scope and objective of the Course:

This course aims at imparting practical aspects of the basic techniques and skills used to make/produce/repair metal and wooden products. This course provides basic manufacturing techniques and allied/supporting techniques used to produce finished products from raw materials. Students will be given practical training on various basic manufacturing techniques like machining, forging, casting, sheet metal working, welding, soldering, brazing and other joining techniques using common machine tools, hand tools and other equipments. Various joining and fitting skills will also be imparted in the practical classes.

#### Books:

##### Text books [TB]:

1. S Nagendra Parashar and R K Mittal, *Elements of Manufacturing Processes*, Prentice Hall of India, 2006, 4<sup>th</sup> print.
2. ME F110 Workshop Practice Manual, BITS Pilani, Dubai Campus.

##### Reference book [RB]:

1. J S Campbell., *Principles of Manufacturing Materials and Processes*, Tata Mc-Graw Hill, New Delhi, 23<sup>rd</sup> reprint 2006.

#### Course Plan:

S. No.	Type of Lab/Shop	Topics to be covered	No. of turns
1	Orientation	Safety procedures and Introduction to workshop	2
2	Fitting	Fitting tools and equipments, basic fitting operations, fabrication of a metal job using fitting skills	2
3	Welding	Welding tools and equipments, common types of welding, welding techniques, fabrication of joints using arc welding and gas welding	2
4	Smithy	Smithy tools and equipments, smithy operations, preparation of a simple job using hot forging skills	1
5	Sheet metal	Sheet metal tools, sheet metal operations, development and fabrication of a job using sheet metal operations	1
6	Carpentry	Carpentry tools and equipments, preparation of a wooden job using various joints & wood turning operations	2
7	Lathe	Main parts of a centre lathe, work holding devices, cutting tools, operations on a centre lathe, machining of a metal job using a centre lathe	2
8	Shaper	Main parts of a shaper, work holding devices, machining of a simple metal job using a shaper	2
9	Milling	Main parts of milling, milling cutters, practice of a simple metal job using Horizontal and Vertical Milling machines	2



S. No.	Type of Lab/Shop	Topics to be covered	No. of turns
10	CNC	CNC fundamentals, Part programming of a component on CNC turning and milling centres	2
11	Metrology	Common measuring instruments used in workshop, experiments, to find the external taper angle using sine bar, to find the deviation using mechanical comparator	2
12	Foundry	Common foundry tools and equipments, preparation of a green sand mould	1
13	Make up	Makeup classes will be provided as per policy	2
14	Casting Demo	Casting of an object using single or split pattern	1
Total no. of classes planned			24

#### Evaluation Scheme:

EC NO	Evaluation Components	Nature of Component	Duration	Weightage %	Date & Time	Venue
1	Practical	Models & Reports Evaluation	As per the Time Table	60	Continuous	To be announced
2	Quiz-1	Closed book	20 minutes	08	05/04/2012* (Th)	
3	Quiz - 2	Closed book	20 minutes	07	27/05/2012* (Su)	
4	Lab Compre Exam	Closed Book	1½ hours	25	To be announced	

\*Quiz will be conducted in the regular test hour slots.

Quiz will be based on the laboratory experiments and lab manual.

#### General Instructions, Attendance & Make-up Policies, etc: Please refer the Time Table

Timings for chamber consultation: Students should contact the Course Instructor in his / her chamber during the CCH for consultation

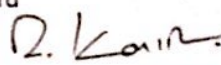
Section 1 Mr. D.Gopinath (Sunday & Wednesday – 4<sup>th</sup> & 5<sup>th</sup> Hour),

Section 3 Mr. D. Purushothaman (Monday – 5<sup>th</sup> & 6<sup>th</sup> Hour, Thursday – 4<sup>th</sup> & 5<sup>th</sup> Hour),

Section 5 Mr. D.Gopinath (Tuesday- 5<sup>th</sup> & 6<sup>th</sup> Hour, Thursday – 2<sup>nd</sup> & 3<sup>rd</sup> Hour),

#### Notices:

All notices will be displayed on the 1<sup>st</sup> year Notice Board and Workshop notice board

  
Dr. R.Karthikeyan  
Instructor-in-charge

#### Instructors' Contact Details:

Dr. R. Karthikeyan (Course Coordinator) – Main Block, Chamber No: 127, Contact Tel. No: 4200700 Ext-218, email: [rkarthikeyan@bits-dubai.ac.ae](mailto:rkarthikeyan@bits-dubai.ac.ae) Mobile No: +971 50 1571477

Mr. D. Purushothaman – Mech Block, Workshop: MG 3, Contact Tel. No: 4200700 Ext-491; Mobile No: +971 50 2195866 Email: [purushothaman@bits-dubai.ac.ae](mailto:purushothaman@bits-dubai.ac.ae)

Mr. D.Gopinath – Mech Block, MT II Store Room: MF 2, Contact Tel. No: 4200700 Ext-492; Mobile No: +971 50 3989193 Email: [dgopinath@bits-dubai.ac.ae](mailto:dgopinath@bits-dubai.ac.ae)



# BITS PILANI, DUBAI CAMPUS

## INSTRUCTION DIVISION

Second Semester 2011 – 2012

### Course Handout (Part – II)

Date: 01-02-2012

In addition to Part I (General Handout for all courses appended to the Time Table) this portion further specific details regarding the course.

Course No. : EEE F111 (3 0 3)  
 Course Title : Electrical Sciences  
 Course Instructors : Dr. Jagadish Nayak, Dr.Karthiyayini, Dr.Kavita. S.Jerath  
 Instructor-in-charge : Dr. Jagadish Nayak

#### Scope and Objective of the Course:

The objective of this course is to teach basic techniques of circuit analysis, electronic devices & their applications and digital electronics. A clear understanding of the topics covered in this course will be of great help in grasping the electrical and electronic engineering courses.

Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description: Given in the Catalogue 2011 – 2012 CD

#### Text book [TB]:

Bobrow, Leonard S., Fundamentals of Electrical Engineering, Oxford University Press, Second Edition, 1996

#### Reference book(s) [RB]:

- (i) B. L. Theraja, Electrical Technology, Vol. I & II , S. Chand & Co. Ltd., India , 2001.
- (ii) Edward Hughes, Hughes Electrical and Electronic Technology, Pearson Prentice Hall 2005, Ninth edition.
- (iii) Smarajit Ghosh, Fundamentals of Electrical and Electronics Engineering, Prentice -Hall of India, 2003.

#### Course Plan / Schedule:

Sl.#	Learning objectives	Topics to be covered	Chapter No [TB]	No. of lectures
1	To study basic circuit elements and the laws	Passive circuit elements, Voltage and current sources, resistors and ohm's law, KCL, KVL, Independent and Dependent sources	1.1-1.4	3
2	To study circuit analysis techniques	Nodal and Mesh analysis	2.1, 2.3	3
3	To study various theorems	Thevenin's, Norton and Maximum Power transfer theorem	2.5, 2.6	4
4	To study the circuits having energy storing elements	V-I relationship of inductors and capacitors, Energy stored in these elements	3.1, 3.2	1
5	To study response of circuits having energy storing elements	Response of First- Order circuits	3.3, 3.4	3
6	To study response of circuits having energy storing elements	Response of Second - Order circuits	3.5	3
7	Concepts of three phase circuits	Star Delta connections, power circuits analysis	4.6,4.7	4
8	Concept and importance of magnetic circuits	Magnetic circuit, magnetic fields and operation.	14.1,14.2	3
9	Transformer- basic features and modeling	Types, ideal and non-ideal transformer, core loss, circuit model ,calculation, voltage regulation, efficiency	14.3-14.5	4
10	Principle and working of DC and AC machines	Constructional features, emf and torque, circuit model, and magnetization characteristics	15.4-15.5	3
11	To study basics of semi conductors	PN junction, Characteristics of diode, Diode circuits , Zener Diodes	6.1-6.6	3
12	To study the construction and operation of Bi-polar Junction Transistor	Basic operation and Characteristics of NPN and PNP transistor, Operations of BJT	7.1-7.3	2



13	To study the construction and operation of FET	Basic operation and Characteristics of JFET and MOSFET.	8.1, 8.2	2
14	To study the application of BJT models in amplifier circuits	Common Emitter, Collector and Base configuration	9.1 (part)	2
15	To study the application of FET models in amplifier circuits	Biasing the FET	9.2 (part)	1
16	Introduction to Operational Amplifiers	OPAMP symbol, operation and applications	2.4	2
17	To study basics of Digital circuits	Logic gates, Boolean Algebra, Half and Full adder	11.3-11.5	2
<b>Total no. of classes planned</b>				<b>45</b>

**Evaluation scheme:**

EC NO	Evaluation Components	Nature of Component	Duration	Weightage %	Date & Time	Venue
1	Test-1	Closed Book	50 minutes	20 <del>25</del> %	01-04-2012 (Su)	To be announced later
2	Quiz-1	Closed book	20 minutes	10 <del>8</del> %	07-03-2012 (W)	
3	Test - 2	Open book*	50 minutes	20 %	20-05-2012 (Su)	
4	Quiz - 2 / Assignment	Closed book	20 minutes	10 <del>7</del> %	25-04-2012 (W)	
5	Compre Exam	Closed Book	3 hours	40 %	14-06-2012 (Th) FN	

\* Only prescribed text book(s) and hand written notes are permitted

**General Instructions, Attendance & Make-up Policies, etc:** Please refer the Time Table

**Timings for chamber consultation:**

Students should contact the Course Instructor in his / her chamber during the CCH for consultation.

Dr. Jagadish Nayak (JNK) Wednesday 6<sup>th</sup> Class period (12.05 to 12.55 PM)

Dr. S. Karthiyayini, (SKY) Wednesday 6<sup>th</sup> Class period (12.05 to 12.55 PM)

Dr. Kavita.S.Jerath, (KJH) Tuesday 5<sup>th</sup> Class period (11.10 to 12.00 AM)

**Notices:**

All notices will be displayed on the 1<sup>st</sup> year Notice Board.



**Dr. Jagadish Nayak**  
Instructor – In- Charge

**Instructors' Contact Details:**

Dr. Jagadish Nayak, Assistant Professor, Room No. 330 (Communication Systems Lab) Third Floor Wing B, , Contact Tel. No. +9714200700 Ext. 436, E-mail: jagadishnayak@bits-dubai.ac.ae

Dr. S. Karthiyayini, Professor – Main Block, Chamber No. 140, Contact Tel. No. +971 4 4200700 / Ext. 231. E.mail: karthiyayini@bits-dubai.ac.ae

Dr. Kavita.S.Jerath, Associate Professor, Main block, Chamber no: 144, Contact tel no: 0501563324, Ext no: 234, email: kavita@bits-dubai.ac.ae



**BITS, PILANI – DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**Second Semester 2011-2012**

**Course Handout (Part - II)**

Date: 01.02.2012

In addition to part I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : CHEM F111 (3 0 3)  
 Course Title : General Chemistry  
 Course Instructors : Dr.B.Muralidharan & Dr.F.Rusal Raj  
 Course-in-charge : Dr.B.Muralidharan

**Scope & Objective of the course:**

This course is composed of two parts. The first part provides a comprehensive survey of various topics in electronic structure of atoms and molecules, spectroscopy, chemical thermodynamics, kinetics. Applications of these in understanding the structure and properties of organic compounds and transition metal complexes will be studied in the second part.

**Text books [TB]:**

T1: P.W. Atkins and Julio de Paula, **Elements of Physical Chemistry**, 5<sup>th</sup> Edition, Oxford University Press, Oxford 2009  
 T2: T. W. Graham Solomons and Craig B. Fryhle, **Organic Chemistry**, 9<sup>th</sup> Edition, John Wiley & Sons, Inc. New York, 2004.

**Reference Books [RB]:**

R1: J.D.Lee, **Concise Inorganic Chemistry**, 5<sup>th</sup> Edition, Blackwell Science, Oxford, 1999.  
 R2: R. T. Morrison and R. Boyd, **'Organic Chemistry'**, 6<sup>th</sup> Edition, PHI, New Delhi, 1992.

**Course Plan / Schedule:**

SN	Learning objectives	Topics to be covered	Ref. to Text Book pages or Articles	No. of lectures
1	Quantum Theory	Origins of Quantum Mechanics, Black body radiation, Wave function, Schrodinger Equation, Uncertainty, Simple Applications.	T1: 12.1-12.7	4
2	Atomic Structure and Spectra	Hydrogenic Atom: Energy Levels and Wavefunctions, Orbitals, Spectral Transitions, Many-electron Atoms: Pauli Principle, Orbital Approximation, Aufbau Principle, Term symbols, Spin-orbit Coupling.	T1: 13.1-13.11, 13.15-13.17	4
3	Chemical Bonding: Valence Bond and Molecular Orbital Theories	VB Theory: Electron Pair Bond, Hybridization, Resonance. MO Theory: LCAO, Bonding and Anti bonding Orbitals, Diatomic Molecules.	T1: 14.1-14.16, T1: A4.2-4.3 (SS)	3
4	Vibrational and Electronic spectroscopy	General Features Vibrational Energy Levels and Spectra and applications; Electronic Spectra: Franck-Condon Principle, Types of Transitions.	T1: 12.9, 19.6-19.11, 19.13, 20.1-20.4, T2: 2.16	3
5	Nuclear Magnetic Resonance	Principles, Chemical Shift, Fine Structure, Spin Relaxation	T1: 21.1-21.4 T2: 9.1-9.8	3
6	Thermodynamics: The First, second and third laws	Thermodynamic Systems, State Functions, Thermal Equilibrium and Temperature, Work, Internal Energy and Heat Transfer, Heat Capacity, Entropy and thermochemistry	T1: Chapters 2-3 (SS), 4.1-4.13	2
7	Spontaneity and equilibrium	Applications of entropy, Gibbs' energy in chemical reactions	T1: 5.1-5.3, 7.1-7.4	1
8	Chemical Kinetics: Experimental Methods, Reaction Rates, Temperature Dependence	Rate Laws, Order, Rate Constants, Arrhenius Equation, Rate-determining step, Steady-state Approximation.	T1: 10.1-10.9, 11.4-11.7	2

Test 2



9	Conformations	Rotation around sigma bonds, conformational analysis of butane, cyclohexane, and substituted cyclohexanes.	T2: 4.8-4.9, 4.10 (SS), 4.11-4.12	2
10	Stereochemistry	Isomerism, chirality, origin of optical activity, stereochemistry of cyclic compounds, resolution.	T2: 5.1-5.13, 5.15-5.18, 7.2	3
11	Substitution reactions	Nucleophilic substitution reactions (both S <sub>N</sub> 1 and S <sub>N</sub> 2) of alkyl halides.	T2: 6.2-6.13	2
12	Elimination reactions	Elimination reaction of alkyl halides; Hoffmann and Cope Elimination.	T2: 6.15-6.19, 7.5-7.8, 20.13	2
13	Addition reactions	Addition reactions to >C=C< bond	T2: 8.1 (SS), 8.2-8.14, 10.9	2
14	Aromaticity and aromatic compounds	Structure and reactivity of benzene and other aromatic compounds.	T2: 14.3-14.7, 15.1-15.2, 15.6-15.11	2
15	Some Concepts in Inorganic Chemistry & Introduction to coordination compounds	Latimer and Frost diagrams; Double salts and coordination compounds. Werner's work; Identification of structure by isomer counting. Effective Atomic No. concept.	Lecture Slides R1: p194-201 (SS)	2
16	VB theory and Crystal field theory for octahedral complexes	Explanation for the stability of complexes according to crystal field theory	R1: p203-214	2
17	Jahn-Teller distortions; Square planar and Tetrahedral complexes	How do geometrical distortions stabilize the system? Stability in other geometries	R1: p214-222	2
18	Chelates & Isomerism	Different types of ligands and stabilization due to entropy factors and electron delocalization in the rings.	R1: p222-224, 307, 351-352, 389, 793, 807. R1 p232-235 (SS)	1
Total no of classes planned				42

#### Evaluation scheme:

EC NO	Evaluation Components	Nature of Component	Duration	Weightage %	Date & Time	Venue
1	Test-I	Closed Book	50 minutes	25	18.03.2012 (Su) 8.00-8.50 am	To be announced later
2	Quiz-1	Closed book	20 minutes	08	11.04.2012 (Wednesday 8 <sup>th</sup> hour)	
3	Test - 2	Open book*	50 minutes	20	06.05.2012 (Su) 8.00-8.50 am	
4	Quiz - 2	Closed book	20 minutes	07	30.05.2012 (Wednesday 8 <sup>th</sup> hour)	
5	Compre Exam	Closed Book	3 hours.	40	10.06.2012 (Su) 8.30- 11.30am	

\* Only prescribed text book(s) and hand written notes are permitted


**General instructions, Attendance & Make-up Policies, etc:** Please refer the Time Table

#### Timings for chamber consultation

Students should contact the Course Instructor in his / her chamber during the CCH for consultation.  
BMR (Sun day, 4<sup>th</sup> Hour) RRJ (Tuesday, 6<sup>th</sup> hour-Sec 1; Sunday, 4<sup>th</sup> hour -Sec 3)

#### Notices:

All notices will be displayed on the 1<sup>st</sup> year Notice Board.

  
Dr. B. Muralidharan  
Instructor-in-charge

#### Instructors' Contact Details:

Dr. B. Muralidharan, (Course Coordinator) – Main Block, Chamber No: 287 Contact Tel. No: 4200700 Ext- 351.  
e-mail: muralidharan@bits-dubai.ac.ae  
Dr. F. Rusal Raj, Main Block, Chamber No: 306 Contact Tel. No: 4200700 Ext- 410.  
e-mail: rusalraj@bits-dubai.ac.ae



**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**Second Semester 2011 – 2012**  
**Course Handout (Part – II)**

Date: 01.02.2012

In addition to Part I (General Handout for all courses appended to the Time Table) this portion further specific details regarding the course.

Course No. : BITS F111 (3 0 3)  
 Course Title : Thermodynamics  
 Course Instructors : Dr.Rajan Ramaswamy , Dr.Geetha  
 Instructor-in-charge : Dr.Rajan Ramaswamy

**Scope and Objective of the Course:**

Thermodynamics deals with energy, matter, and the laws governing their interactions. It is essential to learn its usefulness in the design of processes, devices, and systems involving effective utilization of energy and matter. This course is designed to emphasize the concepts of laws of conservation of energy and useful utilization of Heat and Work, the two forms of energy in transition. The course also emphasizes on the fundamentals and concepts of the laws of thermodynamics as applied to control mass and control volume systems. Irreversibility and availability are powerful tools in the design of thermodynamic systems. Use of standard charts and tables of properties for numerical problem solving is also included.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:** Given in the Catalogue 2011 – 2012 CD

**Text book(s) [TB]**

Sonntag R. E., Claus B. and Van Wylen G., Fundamentals of Thermodynamics, John Wiley & Sons, Seventh edition, 2009. Booklet of Thermodynamics Tables and Figures

**Reference book(s) [RBI]:**

- (i) Nag P.K.; Engineering Thermodynamics, Tata Mc Graw-Hill Publishers, Third edition, 2005  
 (ii) Cengel.Y.A and Boles M.A , Thermodynamics ,an engineering approach ,Mc Graw Hill, sixth edition,2007

**Course Plan / Schedule:**

S.No	Topics to be covered	Learning objectives	Ref. to Text Book	No. of lectures
1.	Thermodynamic system, properties and state, process & cycle, force, energy, pressure, specific volume, zeroth law, numerical problems	Introduction, Units, Concepts & Definitions	2.1-2.10	2
2	The pure substance, Vapor-liquid-solid-phase, Independent property of a pure substance Tables of Thermodynamic properties and their use	Properties of pure Substances	3.1 – 3.4	4
3.	Definition of work and its identification, work done at the moving boundary, other systems that involve work Definition of heat, Heat transfer modes, Comparison of heat and work, numerical problems.	Work and Heat	4.1 – 4.8	5
4.	First law of thermodynamics for control mass, as well as for a change of state; internal energy & enthalpy; problem analysis & solution technique. Specific heat, internal energy and enthalpy of ideal gas, first law as a rate equation, numerical problems.	First law for Control Mass	5.1 – 5.8	6
5.	Conservation mass in control volume, First law for control volume and SS process, examples of SS processes. Transient process, numerical problems.	First law for Control Volume	6.1 – 6.5	6



6	Limitations of first law & need for the second law, Heat engine and refrigerator, The 2 <sup>nd</sup> law of Thermodynamics Kelvin-Planck statement, reversible and irreversible process, The Carnot Engine, Efficiency of a Carnot cycle, Thermodynamic temperature scale, numerical problems	Second law & Carnot Cycle	7.1 – 7.8	6
7	Inequality of Clausius, Entropy- a property of a system, Thermodynamic property relations, entropy change of a reversible and irreversible process	Entropy	8.1 – 8.6	3
8	Entropy change of solid, liquid and ideal gas, polytropic process, Numerical problems	Concepts of Entropy	8.9– 8.11	3
9	Second law of control volume, study of entropy for both reversible and irreversible SSSF process and Numerical problems Second law efficiency, numerical problems	Second law for Control Volume	9.1 – 9.3 9.5	5
10	Available energy, reversible work and irreversibility for control mass and control volume process and numerical problems	Irreversibility and Availability	10.1	3
11	Mixture of ideal gases, Dalton's model, A simplified model of a mixture involving Gases and Vapor, Wet-Bulb and Dry-Bulb Temperature and The Psychrometric chart-problems	Thermodynamics of non reacting mixtures.	12.1-12.2 12.5-12.6	2
Total number of classes planned : 45				

#### Evaluation scheme:

EC No.	Evaluation Components	Nature of Component	Duration	Weightage	Date & Time	Venue
1	Test-I	Closed Book	50 minutes	25 %	11.03.12(Su) 8.00- 8.50am	To be announced later
2	Quiz-1	Closed book	15 -20 minutes	08 %	04.04.12 (W) 8 <sup>th</sup> hour	
3	Test - 2	Open book*	50 minutes	20 %	29.04.12(Su) 8.00- 8.50am	
4	Quiz – 2 / Assignment	Closed book	15 -20 minutes	07 %	23.05.12(W) 8 <sup>th</sup> hour	
5	Compre Exam	Closed Book	3 hours.	40 %	07.06.12(Th) FN	

\* Only prescribed text book(s) and hand written notes are permitted

**General Instructions, Attendance & Make-up Policies, etc:** Please refer the Time Table

**Timings for chamber consultation:** Students should contact the Course Instructor in his / her chamber RRS (Thursday, 3<sup>rd</sup> Hour- sec 1 and Wednesday 6<sup>th</sup> hour - sec 5); GTA (Thursday, 3<sup>rd</sup> Hour).

**Notices:** All notices will be displayed on the 1<sup>st</sup> year Notice Board.

*R. Rajan*  
01/02/12.  
Dr. Rajan Ramaswamy  
Instructor-in-Charge

#### Instructors' Contact Details:

Dr. Rajan Ramaswamy ( Instructor Incharge) – Chamber No. 136, Contact Tel:4200700  
Ext-227 e mail: rajan@bits-dubai.ac.ae

Dr. Geetha – Chamber No. 237, Contact Tel:4200700 Ext-319 e mail: geetha@bits-dubai.ac.ae



**BITS Pilani, Dubai Campus**  
**Course Handout**  
**Second Year (2012-13)**



**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**First Semester 2012 – 2013**

**Course Handout (Part – II)**

Date: 02.09.2012

*In addition to Part I (General Handout for all courses appended to the Time Table) this portion further specific details regarding the course.*

**Course No.** : ECE /EEE / INSTR F211 (3 1 4)  
**Course Title** : Electrical Machines  
**Course Instructors** : Dr. R. Gomathi Bhavani, Mr. Sunil Thomas  
**Instructor-in-charge** : Dr. R. Gomathi Bhavani

**Scope and Objective of the Course:**

The course aims to deal with the following: Thorough knowledge of principle and working of machines like transformers, dc machines, synchronous machines and induction machines. Parameters governing performance and other factors shall be studied by the students.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:**

*Given in the Catalogue 2012 – 2013 CD*

**Text book [TB]:**

Nagrath I J and D P Kothari, **Electric Machines**, Tata McGraw Hill and Company , New Delhi, 4th Edition, 2010

**Reference book(s) [RB]:**

- i. Nagrath I.J and M.R. Poonkuzhali, **Electrical Machines Laboratory Manual (EDD Notes)**, 1998.
- ii. S K Bhattacharya, **Electrical Machines**, Tata McGraw Hill and Company , New Delhi,
- iii. M.G. Say, **Performance and Design of AC machines**, Pitman, London

**Course Plan / Schedule:**

Sl.#	Learning objectives	Topics to be covered	Chapter No	No. of lectures
1	Transformer operation	Constructional features, equivalent circuit and phasor diagram, regulation and efficiency	3	7
2	Parallel operation of transformers	Parallel operation, Three phase transformer connections	3	4
3	Phase conversions	Three phase to two phase conversions- Scott connection , autotransformer	3	2
4	Principles of DC machines	Construction, armature windings, armature voltage and torque equations, classification	7	3
5	Operation and characteristics of DC generators	Methods of excitation, performance characteristics	7	3
6	Characteristics of DC motors	Torque/speed characteristics, speed control and braking	7	4
7	Efficiency of DC machines	Losses and testing of DC machines	7	3
8	Basic principle of induction machines	Constructional features, rotating magnetic field, phasor diagram	9	2
9	Modeling of 3 phase Induction Motor	Circuit model, Power across air gap, Torque and power output, Torque slip characteristics	9	3
10	Testing of 3 phase Induction motor	No-Load and short circuit tests, determination of parameters, circle diagram, starting, speed control	9	4
11	Basics of single phase induction motor	Operation and characteristics of single phase induction motor	10	2
12	Synchronous machines	Constructional features, equivalent circuit and phasor diagram, determination of synchronous reactance	8	4



13	Synchronizing and characteristics	Synchronizing to infinite bus bar, operating characteristics, power angle characteristics, operation at constant load with variable excitation, , capability curves	8	3
14	Synchronous motors	Starting and speed control	8, 11.8	1
15	Special machines	Universal motors, induction generators	10.7, 9.13	Self Study
<b>Total no. of classes planned</b>				<b>45</b>

#### Lab Schedule:

Week #	Activity	Name of experiment
1	Orientation	Familiarity with safety procedures, precaution, main machines, auxiliary equipments, meters, starters etc.
2	Rotor 1	1. No load test on a Single phase transformer
3		2. No load test on a DC shunt motor
4		3. No load test on a Synchronous machine
5		4. No load test on a DC Shunt generator
6		5. No load test on an induction motor
7	Mid sem review	Review/revision of Rotor 1 for possible correction/ improvement
8	Rotor 2	6. Load test on a DC shunt generator
9		7. Sumpner's test and Scott connection
10		8. Hopkinson's test
11		9. Load test on a Synchronous machine (motor)
12		10. Load test on a three phase induction motor
13	End sem review	Review/revision of Rotor 2 for possible correction/ improvement

#### Evaluation scheme:

EC No	Evaluation Components	Nature of Component	Duration	Weightage % (Marks)	Date & Time	Venue
Theory Component 65% (130 marks)						To be announced later
1	Test-1	Closed Book	50 minutes	15% (30)	14.10.12 (Su) 8.00- 8.50am	
2	Quiz-1	Closed book	20 minutes	05% (10)	29.10.12 (M8)	
3	Test - 2	Open book*	50 minutes	10% (20)	09.12.12 (Su) 8.00- 8.50am	
4	Quiz – 2	Closed book	20 minutes	05% (10)	19.11.12 (M8)	
5	Compre Exam	Closed Book	3 hours	30% (60)	06.01.13 (Su) AN	
Lab Component 35% (70 marks)						
6	Lab Experiments	Closed Book	10 turns	20% (40)	Continuous, Rotor 1 & 2	EM Lab
7	Lab Exam	Closed Book	1&1/2 Hours	15% (30)	To be announced	EM Lab

\* Only prescribed text book(s) and hand written notes are permitted

#### General Instructions, Attendance & Make-up Policies, etc:

Please refer the Time Table

#### Timings for chamber consultation:

Students should contact the Course Instructor in his / her chamber during the CCH for consultation.

RGB (M9) (Sec 1)

STS (M3 Sec 2)



**Notices:**

All notices will be displayed on the 2<sup>nd</sup> year Notice Board.

**Dr R. Gomathi Bhavani**  
**Instructor – In- Charge**

**Instructors' Contact Details:**

**Dr. R. Gomathi Bhavani** - Chamber No: 313 A2 Contact Tel. No: 4200700 ext. 419

Email: [gomathi@bitsdubai.ac.ae](mailto:gomathi@bitsdubai.ac.ae)

**Mr. Sunil Thomas**- Main Block, Chamber No: 303, Contact Tel. No: 4200700 Ext-408;

Email: [sunilthomas@bitsdubai.ac.ae](mailto:sunilthomas@bitsdubai.ac.ae)



# BITS PILANI, DUBAI CAMPUS

## INSTRUCTION DIVISION

First Semester 2012 – 2013

### Course Handout (Part – II)

Date: 02.09.2012

In addition to Part I (General Handout for all courses appended to the Time Table) this portion gives further specific details regarding the course.

Course No. : ECE/EEE/INSTR F212 (3 0 3)  
 Course Title : Electromagnetic Theory  
 Course Instructors : Prof. Dr. R. Roop Kumar ; Dr. K.K.Singh  
 Instructor-in-charge : Prof. Dr. R. Roop Kumar

### Scope and Objective of the Course:

The objective of this course is to serve as a prelude to core level physics to be taught to all science and engineering students. It deals with Electricity, Magnetism and Electromagnetic Waves. It also aims to acquire a confidence building knowledge base of solved problems in various topics of Electromagnetic Theory that acts as a springboard for more advanced work related to their specialization in Engineering courses.

Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description: Given in the Catalogue 2012 – 2013 CD

### Text book [TB]:

- (i) Introduction to Electrodynamics, David J Griffiths, Third Edition, PHI, 1999.
- (ii) Field & Wave Electromagnetics, David K. Cheng, Pearson Edu, 2<sup>nd</sup> ed., 1989

### Reference book(s) [RB]:

- (i) Engineering Electromagnetics, Hayt, William H; Buck, John A, Mc Graw-Hill, 2001
- (ii) "PHYSICS" Vol 2, David Halliday, Robert Resnick and Kenneth S. Krane, fifth Edition, John Wiley & Sons, Inc., 2002.

### Course Plan / Schedule:

S.No	Learning Objectives	Topics to be covered	Chapter Nos	No of Lectures
From "Introduction to Electrodynamics" ( TB 1)				
1.	Introduction	Vector Analysis	Chapter I EXCLUDE 1.6	5
2.	Electrostatics	Electric Field, Coulomb's law, Continuous Charge Distribution, Field Lines, Flux, Gauss Law and its applications, Electric potential, Conductors, Capacitors	2.1 - 2.5 EXCLUDE 2.3.3 AND 2.3.5	8
3.	Electric Fields in Matter	Polarization, Field of a polarized object, Electric Displacement, Linear Dielectrics, Field due to Electric Dipole	4.1- 4.4 EXCLUDE 4.3.2, 4.3.3, 4.4.2	8
4.	Magnetostatics	Lorentz Force law, Magnetic fields, Magnetic forces, Magnetic Currents, Biot- Savart Law, Divergence and Curl of B	5.1- 5.4 EXCLUDE 5.4.2, 5.4.3	7
5.	Magnetic Fields in Matter	Magnetization, Field of a Magnetised Object, Ampere's Law in Magnetized Materials, Linear and Non linear Media	6.1- 6.4 EXCLUDE 6.3.2, 6.3.3	8
6.	Electrodynamics	Electromotive Force, Electromagnetic Induction and Maxwell's Equation	7.1- 7.3.3	6
7.	Electromagnetic Waves	Plane wave solutions of Maxwell's equations in free space	9.1, 9.2.1, 9.2.2	3
Total Number of Theory Lectures to engaged				45



**Evaluation Scheme:**

EC NO	Evaluation Components	Nature of Component	Duration	Weightage %	Date & Time	Venue
1	Test-I	Closed Book	50 minutes	25	21/10/2012 (Sunday 8.00am-8.50am)	To be announced later
2	Quiz 1	Closed book	20 minutes	08	02/10/2012 (Tuesday 8 <sup>th</sup> hour, 02.15pm- 2.35pm)	
3	Test - 2	Open book*	50 minutes	20	13/12/2012 (Thursday 8.00am -8.50am)	
4	Quiz 2	Closed Book	15 minutes	07	13/11/2012 (Tuesday 8 <sup>th</sup> hour, 02.15pm- 2.35pm)	
5	Comprehensive Exam	Closed Book	3 hours.	40	08/01/2013 (Tuesday, AN)	

\* Only prescribed text books and handwritten notes are permitted.

**General Instructions, Attendance and Make-up policies, etc :** Please refer the time table

**Timings for chamber consultation:**

Students should contact the Course Instructor in his / her chamber during the CCH for consultation.

RRK – To be announced

KKS – To be announced

**Notices:**

All notices will be displayed on the II year Notice Board .

**Prof. Dr. R. Roop Kumar**  
Instructor - in- charge

**Instructors' Contact Details :**

Dr. R. Roop Kumar, Professor, (Course Coordinator) Room No.125, Contact No: +97150-2289783,  
e-mail: roopkumar@bits-dubai.ac.ae

Dr. K K. Singh, Associate Professor, Room No. 157, Contact No: +97150-8668797, e-mail: singh@bits-dubai.ac.ae



**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**First Semester 2012 – 2013**

**Course Handout (Part – II)**

Date: 02.09.2012

*In addition to Part I (General Handout for all courses appended to the Time Table) this portion further specific details regarding the course.*

**Course No.** : HUM C371 ( 3 )  
**Course Title** : Linguistics  
**Course Instructors** : Dr. Shazi Shah Jabeen, Dr. Lajwanti Aidasani  
**Instructor-in-Charge** : Dr. Shazi Shah Jabeen

**Scope and Objective of the Course:**

The main objective of this course is to provide an introduction to fundamental characteristics of the human language; the structure and system of language; how spoken language relates to written language; how children acquire a language; and diversity and complexity of human languages. It prepares students for future studies of language and communication in a broad range of disciplines: computational linguistics, neurolinguistics, sociolinguistics, and psycholinguistics.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:**

*Given in the Catalogue 2012 – 2013 CD*

**Text book [TB]:**

Yule George. *The Study of Language*. 3<sup>rd</sup> edition. Cambridge: Cambridge University Press. 2006.

**Reference book(s) [RB]:**

- i. Adrian, Akmajian, et al. *Linguistics: An Introduction to Language and Communication*. 5<sup>th</sup> edition. New Delhi: Prentice Hall of India Pvt. Ltd. 2006.  
( with CD-ROM )
- ii. Poole, Stuart C. *An introduction to Linguistics*. New York: Palgrave. 1999.

**Course Plan / Schedule:**

Sl.#	Learning objectives	Topics to be covered	Chapter No	No. of lectures
1	To give an overview of linguistics	Linguistics: an Overview	1	1
2	To discuss the various theories related to origin and characteristics of human language	The Origin and Characteristics of Language	1, 2	2
3	To explain the development of the writing system	The Development of Writing	3	3
4	To study the speech mechanism, articulation and reception of speech sounds	Phonetics	4	4-5
5	To understand the patterns of consonants and vowels	Phonology	5	6-8
6	To teach students the structure and formation of the words and the creative aspect of vocabulary	Morphology	6, 7	9-11
7	To explain the rules of sentence formation and different types of grammar	Syntax	8, 9	12-16
8	To enable students to understand relationships between signs and symbols and what they represent	Semantics	10	17-18
9	To focus on the use of language in social contexts	Pragmatics	11	19-21
10	To study the cognitive process involved in the language acquisition	Language Acquisition	14, 15	22-27



11	To discuss how changes take place in a language and how language relate to each other historically	Language History and Change	17	28-32
12	To highlight the ways in which language varies regionally and socially	Language Variation	18, 19	33-37
13	To focus on the relationship between language and culture	Language and Culture	20	38-40
14	To discuss the impact of linguistics on other fields of study	Language, Linguistics and Other Discipline	10, 7 (RB1)	41-42
Total no. of classes planned			42	

**Evaluation scheme:**

EC No	Evaluation Components	Nature of Component	Duration	Weightage %	Date & Time	Venue
1	Test 1	Closed Book	50 minutes	25%	04.10.12 Th 8.00-8.50am	To be announced later
2	Test 2	Open Book*	50 minutes	20%	01.11.12 Th 8.00-8.50am	
3	Quiz 1	Closed book	20 minutes	15%	To be announced Later	
4	Compre. Exam	Closed Book	3 hours	40%	02.01.13 W (AN)	

\* Only the prescribed textbook and the hand written notes are allowed.

**General Instructions, Attendance & Make-up Policies, etc:**  
Please refer the Time Table

**Timings for chamber consultation:**

Students should contact the Course Instructor in his / her chamber during the CCH for consultation.  
(To be announced)

**Notices:**

All notices will be displayed on the 2<sup>nd</sup> year Notice Board.

Dr. Shazi Shah Jabeen  
Instructor – In- Charge

**Instructors' Contact Details:**

Dr. Shazi Shah Jabeen, Associate Professor (Instructor-in-Charge), Wing A, Room No.128, Contact Tel No: +97144200700 Ext 219, e-mail: [shazi@bitsdubai.com](mailto:shazi@bitsdubai.com)



# BITS PILANI, DUBAI CAMPUS

## INSTRUCTION DIVISION

First Semester 2012 – 2013

Course Handout (Part – II)

Date: 02-09-2012

*In addition to Part I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.*

**Course No.** : MATH C 241 /MATH F211 (3 0 3)  
**Course Title** : MATHEMATICS III  
**Course Instructors** : Dr. K.Kumar, Dr. S.Baskaran;  
**Instructor-in-charge** : Dr. S.Baskaran

### Scope and Objectives of the Course:

This Course reviews and continues the study of differential equations with the objective of introducing classical methods for solving boundary value problems. This course serves as a basis for the applications for differential equations, Fourier series and Laplace transform in various branches of engineering and sciences. This course emphasizes the role of orthogonal polynomials in dealing with Sturm-Liouville problems.

### Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:

*Given in the Catalogue 2012 – 2013 CD*

### Text-Book [TB]:

G. F.Simmons, **Differential Equations with Applications and Historical Notes**, Tata McGraw-Hill, 2nd edition, 1991.

### Reference Book [RB]:

Kreider D.L. and Others: **An Introduction to Linear Analysis**, Addison-Wesley, 1966.

### 6. Course Plan / Schedule:

Sl.#	Learning objectives	Topics to be covered	Chapter No		No. of lectures
1	To introduce the classical methods to solve first order equations	First order equations	Chap. 1 Sec. 1-6	Rev & self study	01
2		First order equations	Chap. 2 Sec. 07		
3		First order equations	Chap. 2 Sec.8,9,10	53-All, 59-All 61- 1 to 4	01
4	To introduce the classical methods to solve second order equations	Reduction of order	Chap. 2 Sec. 11	65-1 to 3	01
5		Second order equations	Chap. 3 Sec 14,15	86-4 to 8, 91-1to 4.	02
6		Use of a known solution	Chap. 3 Sec. 16	94-All	01
7		Euler Equation	4.8 (kk)	1 to 11	01
8		Various methods to solve differential equations	Chap. 3 Sec.17,18,19	97-All, 103-All, 106-All	04
9	To introduce Series Solutions method to 2 <sup>nd</sup> order diff. Equation with variable coefficients	Higher Order Equations and Operator Methods	Chap. 3 Sec. 22,23	127-1to8, 135-All	02
10		Series Solutions	Chap. 5 Sec 26 to 30	175-1, 2; 182-1 to 7; 191-1 to 5, 198-1 to 5	03
11		Hypergeometric equation	Chap. 5 Sec 31	203-All	02
		Legendre Polynomials	Chap. 8 Sec44,45	340-1,2,4; 347-1 to 5	02



12		Hermite and Chebyshev polynomials (Any one of them)	Chap.5 Appendix B (p211) and D ( p230)		01
13		Bessel functions	Chap. 8 Sec. 46,47	356-1 to 6, 363-1 to 5	03
14		Eigenvalues and eigen functions, Sturm-Liouville Problems	Chap. 7 Sec.40,43	308-1	02
15	To introduce systems of equations	Systems of equations	Chap. 10 Sec.54,55,56	420-1,2; 428-5 to9; 433-1 to 5	02
16	Use LT to solve DE and IE	Laplace Transforms	Chap. 9 Sec. 48,49, 50,51,53	384-All, 388-All, 394-1to5, 397-1to 4, 410-2,3,4	04
17		Eulclidean spaces, Piecewise Continuous functions, Inequality Bessel	8.1-8.4(kk) 9.1-9.2(kk)	272-3 to 12 279- 1 to 5, 12 to 15 309- 1to12, 319-1 to3 322-3	self study
18	To introduce F series	Fourier Series	Chap. 6 Sec.33,34, 35,36	256-1to6, 263-1to5, 269-All, 274-1to7	06
19	To introduce classical methods to solve PDE	One dim. Wave equation	Chap. 7 Sec 40	310-5	02
20		One dim. Heat equation	Chap. 7 Sec 41		02
21		Laplace's equation	Chap. 7 Sec 42		01

#### Evaluation Scheme:

EC NO	Evaluation Components	Nature of Component	Duration	Weightage	Date & Time	Venue
1	Quiz-1	Close book	20 minutes	08 %	11.10.12 Th	To be announced later
2	Test-I	Close Book	50 minutes	25 %	04.11.12 Su	
3	Quiz - 2	Close book	20 minutes	07 %	06.12.12 Th	
4	Test - 2	Open book*	50 minutes	20 %	20.12.12 Th	
5	Compre Exam	Close Book	3 hours.	40 %	10.01.13 Th (AN)	

\* Only prescribed text book(s) and hand written notes are permitted

**General Instructions, Attendance & Make-up Policies, etc:** Please refer the Time Table

#### Timings for chamber consultation:

Students should contact the Course Instructor in his / her chamber during the CCH for consultation.  
CCH: To be announced later

#### Notices:

All notices will be displayed on the 2<sup>nd</sup> year Notice Board.

**Dr. S.Baskaran**  
Instructor In-Charge

#### Instructor's Contact Details:

Dr. K.Kumar, Associate Professor, Main Block, Chamber G13, Contact No. +9714-4200700 ext. 114  
E-mail: kumar@bits-dubai.ac.ae

Dr.S.Baskaran,(BKN) Assistant Professor, Main Block, Chamber No. 135, Contact No.+9714-4200700 ext.226,  
E-mail: baskaran@bits-dubai.ac.ae



# BITS PILANI, DUBAI CAMPUS

## INSTRUCTION DIVISION

First Semester 2012 – 2013

### Course Handout (Part – II)

Date: 02.09.2012

*In addition to Part I (General Handout for all courses appended to the Time Table) this portion further specific details regarding the course.*

Course No. : CS/ ECE / EEE /INSTR F215 (3 1 4)  
 Course Title : Digital Design  
 Course Instructors : Dr.R Mary Lourde, Dr. Abdul Razak, Ms.Susila.S, Dr.Jagadish Nayak, Dr. B Vijayakumar, Dr. Kalaichelvi  
 Instructor-in-charge : Ms.Susila.S

#### Scope and Objective of the Course:

The objective of the course is to impart knowledge of the basic tools for the design of digital circuits and to provide methods and procedures suitable for a variety of digital design applications. The course introduces VHDL for digital circuit simulation and fundamental concepts of computer organization. The course also provides laboratory practice using MSI devices.

#### Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:

Given in the Catalogue 2012 – 2013 CD

#### Text book [TB]:

- TB1. M. Morris Mano, " Digital Design", PHI, 4th Edition, 2006  
 TB2. G Raghurama, " Introduction to Computer Organization and Experiments in Digital Electronics", EDD notes 2008.

#### Reference book(s) [RB]:

- RB1. Bignell & Donovan "Digital Electronics" 4th Ed. Thomas Asia Pvt. Ltd. Singapore, 2003.  
 RB2. S. Brown & Z. Vranesic "Fundamentals of Digital Logic with VHDL Design" Mc Graw-Hill Higher Education, 2000

#### Course Plan / Schedule:

S.No	Topics to be covered	Learning objectives	Ref. to Text Book	No. of lectures
1	Digital Systems	Introduction to Digital Systems	1.1; 1.9, 2.8, 10.1, 10.	1
2	Boolean functions Canonical forms, Digital ICs	Boolean algebra and logic gates	2.3-2.7;	2,3,4
3	Binary, Octal, Hexadecimal numbers and codes	Codes and different number systems	1.2-7	5-7
4	K-Maps (4,5 variables) Don't care conditions	Simplification of Boolean functions	3.1 to 3.3, 3.5 to 3.8	8,9
5	Hardware Description Language	Simulation and synthesis basics	3.9	10-12
6	Combinational circuits, Analysis and design Procedure	Design of Combinational Circuits	4.1-3	13-15
7	Adders, Subtractors Multipliers	Arithmetic circuits	4.4-6	16-18
8	Comparators, Decoders, Encoders, MUXs, DEMUXs	MSI Components	4.7 to 4.10	19-20
9	RAM, ROM, PLA, PAL	Memory and PLDs	7.1, 7.2, 7.5-7.7	21-23
10	TTL, MOS Logic families and their characteristics	Digital Integrated Circuits	10.3, 10.5, 10.7 to 10.9	24-26
11	Flip-Flops & Characteristic tables	Sequential Logic	5.1 to 5.3	27-28
12	Analysis of clocked sequential circuits, state diagram and reduction	Clocked Sequential Circuits	5.4 to 5.6	29-30
13	Shift registers, Synchronous & Asynchronous counters	Registers & Counters	6.1 to 6.5	31-33
14	Multiplication & Division Algorithms	Analysis of arithmetic units	TB2: Appendix A	34-36
15	CPU Design, IO Design	Introduction to computer organization	8.1,8.2, 8.4 - 8.7	37-40
16	Memory Hierarchy & different types of memories	Memory Organization	TB2: Ch 6	41-42
<b>Total number of classes planned: 42</b>				



**Practical:****Sl. No.****List of experiment**

1. Familiarisation with Laboratory equipments
2. Implementation of Boolean Functions using Logic Gates
3. Operation of a 4-bit binary counter
4. Adders and subtractors
5. BCD Adder and BCD-to-seven-segment decoder
6. Decoders, Multiplexers and Demultiplexers
7. Latches & Flip-flops
8. Comparators and Arithmetic Logic Unit
9. Counters
10. Shift Register
11. Sequential Circuits - Design and testing of a serial adder
12. Memories and FPGAs

**Evaluation scheme:**

EC No.	Evaluation Components	Nature of Component	Duration	Weightage %	Date & Time	Venue
1	Test-I	Closed Book	50 minutes	12.5	11-10-12 Th	To be announced later
2	Quiz-1	Closed book	20 minutes	5	27-09-12 Th7	
3	Test - 2	Open book*	50 minutes	12.5	25-11-12 Su	
4	Quiz - 2	Closed book	20 minutes	5	08-11-12 Th7	
5	Compre Exam	Closed Book	3 hours.	40	03-01-13 Th (AN)	
6	Practical: Regularity, Lab reports	Open book	As per the time table	10	As per the time table	DECO LAB
7	Lab test & Viva	Closed Book	2 hours	15	To be announced	

\* Only prescribed text book(s) and hand written notes are permitted

**General Instructions, Attendance & Make-up Policies, etc:**

Please refer the Time Table

**Timings for chamber consultation:**

Students should contact the Course Instructor in his / her chamber during the CCH for consultation. SSL

**Notices:**

All notices will be displayed on the 3<sup>rd</sup> year Notice Board.

**Ms.Susila.S**  
Instructor – In- Charge

**Instructors' Contact Details:**

**Dr. Mary Lourde R:** Associate Professor EEE, Room No. A 204 Contact No: +9714 4200700 ext. 304 Email : [marylr@bits-dubai.ac.ae](mailto:marylr@bits-dubai.ac.ae), **Dr. Abdul razak, A.,** Assistant Professor, EEE, Room No. A 282 Contact No: +9714 4200700 ext. 346 Email : [abdulrazak@bits-dubai.ac.ae](mailto:abdulrazak@bits-dubai.ac.ae), **Ms.Susila.S** - Chamber No: 302 Contact Tel. No: 4200700 ext. 402 Email: [susila@bits-dubai.ac.ae](mailto:susila@bits-dubai.ac.ae), **Dr. B. Vijayakumar,** Associate Professor, CS, WING B, Room No. 273 Contact No: +9714-4200699 Ext. no: 342 e-mail: [vijay@bits-dubai.ac.ae](mailto:vijay@bits-dubai.ac.ae), **Dr.Jagadish Nayak** Assistant Professor Room No330 2 Contact No: +9714 4200700 ext. 436 Email: [jagadishnayak@bits-dubai.ac.in](mailto:jagadishnayak@bits-dubai.ac.in), **Dr.V.Kalaichelvi,** Asst. Professor, Chamber No: 284 , Tel No: 4200700 Ext-349, Email: [kalaichelvi@bits-dubai.ac.ae](mailto:kalaichelvi@bits-dubai.ac.ae)



# BITS PILANI, DUBAICAMPUS

## INSTRUCTION DIVISION

First Semester 2014 – 2015

### Course Handout (Part – II)

Date: 02-09-2014

In addition to Part I (General Handout for all courses appended to the Time Table) this portion further specific details regarding the course.

Course No. : ECE F214 /EEE F214/ INSTR F214 (3 0 3)  
 Course Title : Electronic Devices  
 Course Instructors : Dr. S.Swaminathan, Dr.D V Prasad, Dr Kalaichelvi, Dr R Swarnalatha  
 Instructor-in-charge : Dr. S.Swaminathan

#### Scope and Objective of the Course:

This course aims to provide basic understanding of the structure, operation, characteristics and the limitations of the semiconductor devices. Devices fabricated from junctions between semiconductor and semiconductor, metal, and dielectrics, e.g., 'p-n' junction diodes, Field Effect Transistor (FET) and Bipolar Junction Transistor (BJT), is discussed. Starting with the explanations of the fundamentals of semiconductors like energy band formation, conduction of charge carriers, electron and hole concepts, effect of electric and magnetic fields on charge carriers, the course helps in developing the understanding about excess carriers in semiconductors. In-depth study on 'junctions' prepares the students for a detailed study on devices to be studied later like FET and BJT viz. commonly employed in integrated circuit technology for implementation of virtually any requirement. Concepts of semiconductor devices like microwave devices and power devices are also included.

Course Pre/Co-requisite (if any) & Catalogue / Bulletin Description: Given in the Catalogue 2014 – 2015

#### Text book [TB]:

B.G. Streetman & Sanjay Banerjee, "Solid State Electronic Devices", 6th ed., Pearson Prentice Hall.

#### Reference books [RB]:

- i. Donald A. Neamen, "Semiconductor Physics and Devices", 3rd ed., Tata McGraw Hill Education Private Limited.
- ii. M. S. Tyagi, "Introduction to Semiconductor Materials and Devices", Wiley India Limited.

#### Course Plan / Schedule:

Lec. No.	Learning objectives	Content	References@ Chapter No.
1-6	Energy bands and charge carriers in semiconductors	Bonding forces and Energy band, Charge carriers in semi conductors, level, equilibrium carrier concentrations, mobility, Hall effect	3.1 to 3.5
7-12	Excess carriers in semiconductors	Optical absorption, Electroluminescence, continuity equation, Haynes-Shockley experiment	4.1 to 4.4
13-18	Junctions	Forward and reverse biased pn junction, IV characteristics, Reverse bias breakdown diodes, Transient AC conditions, Switching diodes, Metal semiconductor junctions, Hetero junctions	5.2 to 5.5 & 5.7
19-24	Field Effect Transistors	Transistor operation, Junction FET, MISFET, MOS capacitor, MOSFET	6.2 to 6.5
25-30	Bipolar junction transistors	BJT operation, amplification, Switching, Fabrication, Frequency limitations of transistors	7.1, 7.2, 7.3, 7.5, 7.6, 7.8
31-35	Optoelectronic Devices	Photodiodes, solar cells, LEDs, Lasers, Semiconductor Lasers	8.1 to 8.4
36-41	High frequency and high power devices	Tunnels Diodes, IMPATT Diodes, GUNN Diodes, p-n-p-n Diode, SCR, IGBT	10.1 to 10.6
42-45	Compound semiconductor devices	HBT and HEMT devices	LECTURE NOTES



**Evaluation scheme:**

EC NO	Evaluation Components	Nature of Component	Duration	Weightage %	Date & Time	Venue
1	Test-1	Closed Book	50 Minutes	25	2-10-2014 Th8	To be announced later
2	Quiz-1	Closed Book	20 Minutes	8	21-10-2014 T5	
3	Test - 2	Open Book	50 Minutes	20	18-11-2014 T8	
4	Quiz - 2	Closed Book	20 Minutes	7	9-12-2014 T5	
5	CompreExam	Closed Book	3 Hours	40	8-1-2015 Th AN	

\* Only prescribed text book(s) and hand written notes are permitted

**General Instructions, Attendance & Make-up Policies, etc:**

*Please refer the Time Table*

**Timings for chamber consultation:**

Students should contact their Course Instructors in their chamber during the CCH for consultation.

**Notices:**

All notices will be displayed on the II<sup>nd</sup> year Notice Board.

Dr. S Swaminathan  
Instructor – In- Charge

**Instructors' Contact Details:**

**Dr. S Swaminathan**, Professor, Room No.289, Contact Tel. No. +9714200700 Ext.353,  
E-mail: [swami@dubai.bits-pilani.ac.in](mailto:swami@dubai.bits-pilani.ac.in)

**Dr. D V Prasad**, Associate Professor, Chamber No. 278, Contact Tel. No. +971 4 4200700 / Ext. 334,  
E mail: [prasad@dubai.bits-pilani.ac.in](mailto:prasad@dubai.bits-pilani.ac.in)

**Dr Kalaichelvi**, Assistant Professor, Room No.284, Contact Tel. No. +971 4 4200700 Ext. 349,  
Email: [kalaichelvi@dubai.bits-pilani.ac.in](mailto:kalaichelvi@dubai.bits-pilani.ac.in)

**Dr R Swarnalatha**, Assistant Professor, Room No.329, Contact Tel. No. +971 4 4200700 Ext.434.,  
Email: [swarnalatha@dubai.bits-pilani.ac.in](mailto:swarnalatha@dubai.bits-pilani.ac.in)



**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**SECOND SEMESTER 2012 - 2013**

Course Handout (Part II)

Date 03 02 2013

In addition to part-I (General Handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

**Course No.** : CS / ECE/ EEE/ INSTR F241 ( 3 1 4 )  
**Course Title** : Microprocessors and Interfacing  
**Course Instructors** : S. Susila, S. Jeyalatha , Ms.Susanna S Henry  
**Instructor-in-charge** : S. Susila

**Scope and Objective of the Course:** Elements of digital electronics, PC organization, 80X86 as CPU Instruction set, Register set, timing diagrams, Modular assembly programming using procedures & macros, Assembler, Linker & Loader concepts, concepts of interrupts; hardware interrupts, software interrupts and BIOS & DOS interrupts, Disk organization: Boot sector, Boot partition, root directory & FAT, Memory interfacing & Timing diagrams, IO and interfacing, Programmable I/O devices such as 8255, 8253, 8259 etc. System design case studies.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:** Given in the Catalogue 2012 – 2013 CD

**Text book(s) [TB]:** (I) Brey, Barry B The Intel Microproc.: Arch, Prog. & Interf Pearson Edu., 8/E, 2009

(II) Gurunarayanan, S and Others Microprocessor Prog. & Interfacing Notes-EDD, 2006

**Reference book(s) [RB]:** Douglas V Hall, "Microprocessor and Interfacing" TMH, Second Edition.

**Course Plan / Schedule:**

Theory

S.N o	Topics to be covered	Learning objectives	Ref. to Text Book	No. of lectur es
1	Historical background, Developmental path for Intel Family Processor	Introduction to Microprocessor and Microcomputers	Ch 1	2
2	Storage hierarchy, Disk structure & Org	Secondary storage elements in a PC	Notes	2
3	File Allocation Tables	MS-DOS Disk format	Notes	1
4	Root Directory structure	File Storage concepts	Notes	1
5	Concept of buses and real mode of operation, internal functional units	Microprocessors and its Architecture 8086 Pentium Pro	2.1	2
6	Register Sets	Microprocessors and its Architecture 8086 Pentium Pro	2.1	2
7	Real mode memory addressing	Microprocessors and its Architecture 8086 Pentium Pro	2.2	2
8	Addressing Modes	Assembly Programming	Ch 3	2
9	Data Transfer Instruction Machine coding of instructions	Assembly Programming	Ch 4	3
10	Arithmetic and Logic Instructions	Assembly Programming	Ch 5	2
11	Program Control Instruction Conditional and unconditional branch instructions	Assembly Programming	Ch 6	2
12	Procedures and Macros	Assembly Programming	Ch 8	2



13	Modular assembly programming with suitable examples	Assembly Programming	Ch 8	2
14	8086 hardware Specifications	Hardware Specifications	9.1-9.2	
15	Instruction Cycle, Machine cycles, T-states, wait states	CPU Timing diagrams	9.4 – 9.5	2
16	Bus buffering & Latching	Memory Interfacing	9.3	2
17	Odd and even banks	Memory Interfacing	10.4	1
18	Address decoding, 8/16 bit SRAM & ROM interfacing	Memory Interfacing	10.2	2
19	Basic I/O interfacing (I/O mapped I/O and Memory mapped I/O) I/O port address decoding	I/O Interfacing	11.1, 11.2	2
20	Types of interrupts, Vector tables, Priority Schemes	Interrupts	12.1, 12.2	2
21	8255 – Modes of operation and interfacing	Programmable Peripheral Devices	11.3	2
22	8254 – Modes of operation and interfacing	Programmable Peripheral Devices	11.4	2
23	8259	Programmable Interrupt Controller	12.4	1
24	8237	DMA controller	13.1, 13.2	1
25	Sample Case Study	System Design Examples		1

\* The lectures may be slightly diverge from aforesaid plan based on students' background & interest in the topic, which may perhaps include special lectures and discussions that would be planned and schedule notified accordingly.

#### Practical Schedule:

S. No.	Experiments	Weeks
1	Familiarization with debug	1 - 2
2	Familiarization with MASM	3 - 4
3	MOV, String transfer, PUSH/POP instructions	5 - 6
4	Arithmetic and logical instructions	7 - 9
5	Jump instructions, procedures and macros	10 - 12
6	DOS and BIOS interrupts	13
7	Introduction to hardware interfacing experiments	14

#### Evaluation scheme:

EC No	Evaluation Components	Nature of Component	Duration	Weightage	Date & Time	Venue
1	Test-I	Closed Book	50 minutes	20%	11.03.13 M 8	To be announced
2	Quiz-1	Closed book	15 -20 minutes	5%	25.03.13 M8	
3	Test - 2	Open book*	50 minutes	20%	29.04.13 M 8	
4	Lab	Lab Test Lab Activities	To be announced	10% 5%	TBA	
5	Compre Exam	Closed Book	3 hours.	40%	04.06.13 T (FN)	

\* Only prescribed text book(s) and hand written notes are permitted



**Mid-sem Grading:**

Mid-sem grading will be displayed after two evaluation components or earlier whenever about 40 % of evaluation components are completed.

**Note:** A student will be likely to get "NC", if he / she

- Doesn't appear / appear for the sake of appearing for the evaluation components / scoring zero in pre-compre total.
- Scoring zero in the lab component / Abstaining from lab classes throughout.
- 

**Makeup and Attendance policies:**

**Make-ups** are not given as a routine. It is solely dependent upon the genuineness of the circumstances under which a student fails to appear in a scheduled evaluation component. In such circumstances, prior permission should be obtained from the Instructor-in-Charge (I/C). The decision of the I/C in the above matter will be final.

**Attendance:** Every student is expected to be responsible for regularity of his/her attendance in class rooms and laboratories, to appear in scheduled tests and examinations and fulfill all other tasks assigned to him/her in every course. A student should have a minimum of 50% of attendance in a course to be eligible to appear for the Comprehensive Examination in that course. For the students under the purview of Academic Counseling Board (ACB), the Board shall prescribe the minimum attendance requirement on a case-to-case basis. Attendance in the course will be a deciding factor in judging the seriousness of a student which may be directly / indirectly related to grading.

**General timings for consultation:**

Each instructor will specify his / her chamber consultation hours during which the student can contact him / her in his / her chamber for consultation. (For details see part II)

**General Instructions:**

Students should come prepared for classes and carry the text book(s) or material(s) as prescribed by the Course Faculty to the class.

**Notices:** All notices will be displayed on the II year Notice Board.

  
S. Susila  
Instructor-In-Charge

**Instructors' Contact Details:**

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**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**SECOND SEMESTER 2012 - 2013**

Course Handout (Part II)

Date: 03.02.2013

In addition to part-I (General Handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

Course No : EEE/ ECE/ INSTR F242 (3 0 3)  
 Course Title : Control Systems  
 Course Instructors : Dr. R.Gomathi Bhavani; Dr R Swarnalatha  
 Instructor-in-charge : Dr. R.Gomathi Bhavani

Scope and objective of the course:

Feedback automatic control systems are an essential feature of numerous industrial processes, scientific instruments and even commercial, social and management situations. A thorough understanding of the elementary principles of this all embracing technology is of great relevance for all engineers and scientists. This course tries to bring out the basic principles of Feedback control system.

Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description: Given in the Catalogue 2012 – 2013 CD

Study Material:

Text Books:

Nagrath I.J. and M.Gopal, Control systems Engineering, New Age International (p) Limited 5<sup>th</sup> Edition.

Reference book(s):

- (i) Eugene Xavier S P , Babu ,J C, Principles of Control Systems, S Chand & Company Ltd First Edition.  
 (ii) Kuo , B C , Automatic Control System, Prentice Hall, 5<sup>th</sup> Edition..

Course plan:

Lec. No.	Learning objectives	Contents	References@ (Chapters)
1-2	Introduction, Concept of measurement, feedback and automatic control. Examples from various fields, History of control ; Classification of systems: Linear / non linear, time invariant/ time variant, lumped/distributed parameters, analog /digital	General understanding of the concept of control. Identification of various examples encountered in life from engineering and non –engineering fields as well.	1.1, 1.2, 1.3, 1.4
3-5	Mathematical modeling, integro-differential equations for electrical , mechanical and electro mechanical systems , transfer functions	Making block diagram models of various systems and working out Transfer Function by various methods	2.1, 2.2, 2.4
6-7	Examples of control with armature Controlled dc motor as drive. Block diagram development, closed loop transfer function, examples of control with field controlled dc motor	-do-	2.4
8-10	Block diagram reduction examples	-do-	2.5
11-13	Signal Flow Graph, Masons Gain formula, Examples	-do-	2.6
14	Feedback and Non- feedback systems	Open loop and closed loop example.	3.1
15-17	Properties and advantages of feedback systems	Sensitivity to parameter variation. Concept of frequency content in signals, further examples	3.2, 3.6, 3.7
18-23	Time response analysis of dynamic systems to different excitations	Various test signals in time domain, response of zeroth and first order systems, second order systems, standard form; time response expression, Time response specifications of second order systems; MATLAB commands for time response	5.1, 5.2, 5.3, 5.4, 5.5
24-26	To apply Routh Test to study closed loop system stability	Stability , Performance Analysis	6.1, 6.2, 6.3, 6.4, 6.6
27-32	To draw root locus for various systems and study the information on time response and stability	Root locus: Introduction, Magnitude and Angle criterion, root locus for second order systems with 2 poles, Second order with one zero, other rules of root locus, higher order	7.1, 7.2, 7.3, 7.4



		examples, Root contours, More examples of root locus, MATLAB commands	
33-35	To plot frequency response of systems and use it for analysis by frequency domain approach	Frequency response analysis: Introduction, Polar plot, Polar Plot examples	8.1, 8.2, 8.3
36-38	Identification of Transfer function from Bode plot; Gain margin and Phase margin	Bode plots; MATLAB commands	8.4
39-41	To design PID controller and robust controllers	Introduction to Controller Design	10.1, 10.2, 10.3 & class notes
42-45	To study concepts of State, State Variables and State Models	State space analysis	12.1, 12.2, 12.3, 12.4

\* The lectures may be slightly diverge from aforesaid plan based on students' background & interest in the topic, which may perhaps include special lectures and discussions that would be planned and schedule notified accordingly

#### Evaluation Scheme:

EC No	Evaluation Components	Nature of Component	Duration	Weightage % (Marks)	Date & Time	Venue
1	Test-1	Closed Book	50 minutes	25 % (50)	14.03.13 (Th 6)	To be announced later
2	Quiz-1	Closed book	20 minutes	08% (16)	28.02.13 (Th 6)	
3	Test - 2	Open book*	50 minutes	20% (40)	02.05.13 (Th 6)	
4	Quiz - 2	Closed book	20 minutes	07% (14)	11.04.13 (Th 6)	
5	Compre Exam	Closed Book	3 hours	40% (80)	05.06.13 (W) AN	

\* Only prescribed text book(s) and hand written notes are permitted.

#### Mid-sem Grading:

Mid-sem grading will be displayed after two evaluation components or earlier when- ever about 40 % of evaluation components are completed.

**Note:** A student will be likely to get "NC", if he / she

- Doesn't appear / appear for the sake of appearing for the evaluation components / scoring zero in pre-compre total.
- Scoring zero in the lab component / Abstaining from lab classes throughout.

#### Makeup and Attendance policies:

**Make-ups** are not given as a routine. It is solely dependent upon the genuineness of the circumstances under which a student fails to appear in a scheduled evaluation component. In such circumstances, prior permission should be obtained from the Instructor-in-Charge (I/C). The decision of the I/C in the above matter will be final.

**Attendance:** Every student is expected to be responsible for regularity of his/her attendance in class rooms and laboratories, to appear in scheduled tests and examinations and fulfill all other tasks assigned to him/her in every course. A student should have a minimum of 50% of attendance in a course to be eligible to appear for the Comprehensive Examination in that course. For the students under the purview of Academic Counseling Board (ACB), the Board shall prescribe the minimum attendance requirement on a case-to-case basis. Attendance in the course will be a deciding factor in judging the seriousness of a student which may be directly / indirectly related to grading.

#### General timings for consultation:

Each instructor will specify his / her chamber consultation hours during which the student can contact him / her in his / her chamber for consultation. (For details see part II)

#### General instructions:

Students should come prepared for classes and carry the text book(s) or material(s) as prescribed by the Course Faculty to the class.

#### Notices:

All notices concerning the course will be displayed on the respective Notice Boards.

*R. Gomathi*  
Instructor-in-Charge  
Dr. R. Gomathi Bhavani

#### Contact details

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Dr. R. Swarnalatha, Asst. Professor, Chamber No. 329A1, Contact No. +971-4-4200700 Ext. 434;  
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**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**SECOND SEMESTER 2012 - 2013**

Date: 03.02.2013

In addition to Part I (General Handout for all courses appended to the Timetable) this portion gives further specific details regarding the course.

**Course Number :** EEE / INSTR / ECE F243 (3 0 3)  
**Course Title :** Signals & Systems  
**Course Instructors :** Dr.A.B.Chattopadhyay & Mr. Sunil Thomas  
**Instructor -in-Charge :** Mr. Sunil Thomas

**Scope and Objective of the Course:**

This course is intended to provide a comprehensive coverage of Signals and Systems, a fundamental subject of Electrical Engineering. The course objectives are:

- i) To introduce the students to basic concepts of continuous and discrete signal, system modeling and system classifications.
- ii) To develop the students' understanding of time domain and frequency domain approaches to continuous and discrete systems.
- iii) To introduce the students to the rudiments of analog filter design.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:** Given in the Catalogue 2012 – 2013 CD

**Text Books:**

- T1. B.P. Lathi, **Principles of Signal Processing and Linear Systems**, OUP, 2<sup>nd</sup> ed., 2009.  
 T2. Nagrath, I.J. and S.N. Sharan, **Signals and Systems**, TMH, 2<sup>nd</sup> ed., 2009.

**Reference Book (RB):**

A.V. Oppenheim, et al., **Signals and Systems**, PHI, 1998

**Course Plan / Schedule:**

Lec. No.	Learning objectives	Contents	References@ (Chapters)
1	Introduction	Introduction to the course	
2-4	Basic aspects of signals and systems	Classification of signals and systems	T1, T2: 1
5-7	Useful signal operations	Signal operations	T1: 1
8-11	Time-domain analysis of continuous-time systems	Linear convolution, graphical analysis, response of continuous-time systems	T1:2, T2: 2
12-14	Linear time-invariant(LTI) systems	Properties of discrete-time sequences	T2:3
15-18	Signal representation by Fourier series	Fourier series and its properties	T1 : 3, T2: 2
19-22	Spectral representation of aperiodic signals	Sampling of signals	T1: 4, T2: 2
23-25	Sampling and Reconstruction	Theorem and signal reconstruction	T1: 5
26-29	Generalized form of the Fourier transform	Review of Fourier transform and its properties	T1: 6, T2: 2
30-34	Continuous –Time system analysis	Laplace transform and its application to electrical networks.	T1: 6
35-38	Frequency-domain analysis of discrete-time systems	Z-transform, properties, inverse z-transform, system response.	T2: 3
39-41	System Analysis	Block diagram and system realization using Laplace domain	T1: 6.5, 6.6
42-45	Frequency response and Analog filter design	Introduction to analog filters	T1: 7

\* The lectures may be slightly diverge from aforesaid plan based on students' background & interest in the topic, which may perhaps include special lectures and discussions that would be planned and schedule notified accordingly.



**Evaluation Scheme:**

EC NO	Evaluation Components	Nature of Component	Duration	Weightage	Date & Time	Venue
1	Test - 1	Closed Book	50 minutes	25 %	18.03.13 (Monday, 12:05 pm to 12:55 pm)	To be announced later
2	Test - 2	Open book*	50 minutes	20 %	06.05.13 (Monday, 12:05 pm to 12:55 pm)	
3	Quiz - 1	Closed Book	20 minutes	7.5 %	28.02.13 (Thursday, 8:30 am to 8:50 am)	
4	Quiz - 2	Closed Book	20 minutes	7.5 %	15.04.13 (Monday, 12:10 pm to 12:30 pm)	
5	Comprehensive Exam	Closed Book	3 hours.	40 %	08.06.13 (Saturday, 12:30- 3:30 pm)	

\* Only prescribed text book(s) and hand written notes are permitted

**Mid-sem Grading:**

Mid-sem grading will be displayed after two evaluation components or earlier whenever about 40 % of evaluation components are completed.

**Note:** A student will be likely to get "NC", if he / she

- Doesn't appear / appear for the sake of appearing for the evaluation components / scoring zero in pre-compre total.

**Makeup and Attendance policies:**

**Make-ups** are not given as a routine. It is solely dependent upon the genuineness of the circumstances under which a student fails to appear in a scheduled evaluation component. In such circumstances, prior permission should be obtained from the Instructor-in-Charge (I/C). The decision of the I/C in the above matter will be final.

**Attendance:** Every student is expected to be responsible for regularity of his/her attendance in class rooms and laboratories, to appear in scheduled tests and examinations and fulfill all other tasks assigned to him/her in every course. A student should have a minimum of 50% of attendance in a course to be eligible to appear for the Comprehensive Examination in that course. For the students under the purview of Academic Counseling Board (ACB), the Board shall prescribe the minimum attendance requirement on a case-to-case basis. Attendance in the course will be a deciding factor in judging the seriousness of a student which may be directly / indirectly related to grading.

**General timings for consultation:**

Each instructor will specify his / her chamber consultation hours during which the student can contact him / her in his / her chamber for consultation. (For details see part II)

**General instructions:**

Students should come prepared for classes and carry the text book(s) or material(s) as prescribed by the Course Faculty to the class.

**Notices:**

All notices concerning the course will be displayed on the respective Notice Boards.

**Mr. Sunil Thomas**  
Instructor – In- Charge

**Contact details**

Name: Sunil Thomas  
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email:sunilthomas@bits-dubai.ac.ae

Designation : Lecturer  
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Name: Dr.A.B.Chattopadhyay  
Contact details: Chamber No134:  
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Designation : Associate Professor  
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# BITS PILANI, DUBAI CAMPUS

## INSTRUCTION DIVISION SECOND SEMESTER 2012 - 2013



### Course Handout (Part II)

Date: 03.02.2013

In addition to part-I (General Handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

Course No : EEE/ INSTR/ ECE F244 (3 0 3)  
Course Title : MICROELECTRONIC CIRCUITS  
Instructor-in-charge : Dr. JAGADISH NAYAK  
Instructors : Dr. GUNTURU VIJAYA, Dr. JAGADISH NAYAK

### Scope and objective of the course:

The objective of this course is to develop the ability to analyze and design discrete and integrated electronic circuits. The course aims at thorough understanding of internal electronic circuits and structures necessary for effective and reliable applications of integrated circuits. The course also includes the usage of SPICE/Electronic Workbench as circuit design aid.

Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description: Given in the Catalogue 2012 – 2013 CD

### Study Material:

#### Text Books:

[TB] Adel. S. Sedra, Kenneth C Smith, "Microelectronic Circuits", Oxford University Press, Fifth Edition, 2004.

#### Reference books:

1. Richard. C. Jaeger, "Microelectronic Circuit Design", McGraw-Hill Companies Inc., International Edition, 1997.
2. Muhammad Rashid, Introduction to PSpice Using OrCAD for Circuits and Electronics 3<sup>rd</sup> Edition, Pearson Education.

### Course plan:

Lec. No.	Learning objectives	Contents	References@ (Chapters)
1	Understanding of an amplifier	Introduction to Amplifiers, Characteristics and Biasing.	1.4 [TB]
2	To study representation of an amplifier model	Circuit model for amplifiers	1.5 [TB]
3	Understand the frequency response characteristics of the amplifier	Frequency response of amplifiers	1.6 [TB]
4	BJT and its DC analysis for the amplifier circuit	BJT as an amplifier, Large-Signal operation (transfer characteristics) Amplifier gain, graphical analysis, BJT at the DC	<del>5.3-5.4</del> [TB] 3.3 3.4
5	To study BJT amplifier circuits	Biasing in BJT amplifier circuit	<del>6.5</del> [TB] 3.5
6	Study of small signal BJT amplifiers characteristics and its model	Small Signal operation and model Collector current, Transconductance, base current, input resistance at the base, emitter current and input resistance at the Emitter.	<del>5.6</del> [TB] 3.6
7	Study of small signal BJT amplifiers characteristics and its model	Input resistance at the base, emitter current and input resistance at the Emitter.	<del>5.6</del> [TB] 3.6
8	Study of small signal BJT amplifiers characteristics and its model	Voltage gain, The dc and signal quantities, the hybrid- $\pi$ model, the T-model, application of the small signal equivalent model. Early effects in the models.	<del>5.6</del> [TB] 3.6
9	Study of Single stage transistor amplifier	Basic structure and characteristic of BJT Amplifiers.	<del>5.7</del> [TB]
10	Study of Single stage transistor amplifier	The Common-Emitter Amplifier, with emitter resistance	<del>5.7</del> [TB] 3.7
11	Study of Single stage transistor amplifier	The common base amplifier, Common collector amplifier	<del>5.7</del> [TB] 3.7
12	To study effects of internal capacitances in BJT in high frequency models	The BJT internal capacitances and high frequency model	<del>5.8</del> [TB] 3.8



13	MOSFET amplifier circuits and its model	Biasing in MOSFET amplifier circuits	4.5 [TB]
14	MOSFET amplifier circuits and its model	Small-signal operation and model	4.6 [TB]
15	MOSFET amplifier circuits and its model	Single stage MOS amplifiers	4.7 [TB]
16	MOSFET amplifier circuits and its model	The MOSFET Internal Capacitances and High frequency models.	4.8 [TB]
17	To understand and design biasing circuits for Integrated circuits	IC Biasing, Current sources, current mirrors, MOS current steering circuits	6.3 [TB]
18	To study IC amplifiers with active load	Common-source and Common-emitter amplifiers with active loads.	6.5 [TB]
19	Study of Cascode Amplifier	The MOS Cascode	6.8 [TB]
20	Study of Cascode Amplifier	BJT Cascode and Darlington Configuration, source and emitter followers	6.8, 6.10, 6.11 [TB]
21	Differential amplifiers.	MOSFET differential pair	7.1 [TB] 8.1
22	Differential amplifiers.	Small-signal operation of MOS differential pair	7.2 [TB] 8.2
23	Differential amplifiers.	BJT differential pair	7.3 [TB] 8.3
24	Differential amplifiers.	The differential amplifier with active load	7.5 [TB] 8.5
25	Multistage amplifiers	A two stage CMOS Op-Amp	7.7 [TB] 8.7
26	Multistage amplifiers	A bipolar op-Amp	7.7 [TB] 8.7
27	To study the frequency response of amplifiers	Frequency response of CS amplifier	4.9 [TB]
28	To study the frequency response of amplifiers	Frequency response of Common Emitter amplifier	5.9 [TB] 3.9
29	To study the frequency response of amplifiers	Frequency response of the Differential amplifier	7.6 [TB] 8.6
30	To study the frequency response of amplifiers	Frequency response of the multistage amplifier	9.1 [TB]
31	Study of feedback amplifiers	Introduction and General feedback structure, properties of negative feedback	8.1, 8.2 [TB] 7.1, 7.2
32	Study of feedback amplifiers	Introduction to Four basic feedback structure	8.3 [TB] 7.3
33	Study of feedback amplifiers	The Series-Shunt feedback amplifier	8.4 [TB] 7.4
34	Study of feedback amplifiers	Series-Series feedback amplifier	8.5 [TB] 7.5
35	Study of feedback amplifiers	The Shunt-Shunt and Shunt-Series feedback amplifiers	8.6 [TB] 7.6
36	Study of feedback amplifiers	Loop gain stability issues	8.7 [TB] 7.7
37	Frequency Compensation	Theory and implementation	8.11 [TB] 7.11
38	To study output stage transistor	Classification of output stages, class A,	14.1, 14.2, [TB] 12.1, 12.2
39	To study output stage transistor amplifier	Class B output stage amplifier.	14.3 [TB] 12.3
40	To study output stage transistor amplifier	Class AB output stage amplifier	14.4 [TB] 12.4
41	Power amplifier	Power BJTs, IC power amplifiers	14.7, 14.8 [TB] 12.8, 12.10
42	Study of Operational Amplifier	CMOS Op-Amp and 741 Op-Amp	9.1, 9.3 [TB]

\* The lectures may be slightly diverge from aforesaid plan based on students' background & interest in the topic, which may perhaps include special lectures and discussions that would be planned and schedule notified accordingly.

#### Evaluation Scheme:

EC No	Components	Duration	Weightage%	Date & Time	Venue
1	Test 1 (Closed Book)	50 Minutes	25	21-03-2013 Th 5	[TBA]
2	Quiz 1	20 Minutes	8	7.3.13 [TBA]	
3	Test 2 (Open Book)	50 Minutes	20	12-05-2013 Su 4	
4	Quiz 2/PSPICE assignment	20 Minutes	7	[TBA]	
5	Comprehensive Examination	180 Minutes	40	10-06-2013 M(AN)	

\* Only prescribed text book(s) and hand written notes are permitted.

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**\* Assignment / Practical / Field / Case Studies:** The Assignment / Practical will be given / conducted on either some or all of the above mentioned topics. Case studies, interpretation of data and then analysis, will form a part of all evaluation components. Assignments(s) may include seminar presentation and viva. Details will be intimated through a separate notification or announced in the class and the deadlines would be indicated therein. However all assignments/reports would be completed by 2<sup>nd</sup> week of May, 2013. It is necessary that all students stick to time schedule and do not postpone submission of assignments/reports. This will prevent extra load during last two weeks of class work. No make-ups would be allowed for submission of assignments / practical reports.

**Reading Assignments:** Students are advised to read, collect additional information on the above mentioned topics as per given schedule. In addition, awareness w.r.t. latest developments in the area would be an added advantage.

**Mid-sem Grading:**

Mid-sem grading will be displayed after two evaluation components or earlier whenever about 40 % of evaluation components are completed.

**Note:** A student will be likely to get "NC", if he / she

- Doesn't appear / appear for the sake of appearing for the evaluation components / scoring zero in pre-compre total.
- Scoring zero in the lab component / Abstaining from lab classes throughout.

**Makeup and Attendance policies:**

**Make-ups** are not given as a routine. It is solely dependent upon the genuineness of the circumstances under which a student fails to appear in a scheduled evaluation component. In such circumstances, prior permission should be obtained from the Instructor-in-Charge (I/C). The decision of the I/C in the above matter will be final.

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**General timings for consultation:**

Each instructor will specify his / her chamber consultation hours during which the student can contact him / her in his / her chamber for consultation. (For details see part II)

**General instructions:**

Students should come prepared for classes and carry the text book(s) or material(s) as prescribed by the Course Faculty to the class.

**Notices:**

All notices concerning the course will be displayed on the respective Notice Boards.

Instructor-in-Charge

**Contact details**

Dr. Gunturu Vijaya, Professor  
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# BITS PILANI, DUBAI CAMPUS

INSTRUCTION DIVISION  
SECOND SEMESTER 2012 - 2013

## Course Handout (Part II)

Date: 03-02-2013

In addition to part-I (General Handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

Course No. : MATH F211 (3 0 3)  
Course Title : MATHEMATICS III  
Instructor-In-charge : Dr. S.Baskaran  
Course Instructors : Dr. Priti Bajpai, Dr. K.Kumar, Dr. A.Somasundaram, Dr. S.Baskaran

### Scope and Objectives of the Course:

This Course reviews and continues the study of differential equations with the objective of introducing classical methods for solving boundary value problems. This course serves as a basis for the applications for differential equations, Fourier series and Laplace transform in various branches of engineering and sciences. This course emphasizes the role of orthogonal polynomials in dealing with Sturm-Liouville problems.

**Course Pre/Co-requisite (if any) & Catalogue / Bulletin Description:** Given in the Catalogue 2012 – 2013 CD

### Study Material:

**Text Book:** G. F. Simmons, Differential Equations with Applications and Historical Notes, Tata McGraw-Hill, 2nd edition, 1991.

**Reference Book:** Kreider D.L. and Others: An Introduction to Linear Analysis, Addison-Wesley, 1966

### Course Plan:

Lec. No.	Learning objectives	Contents	References@ (Chapters)
1	To introduce the classical methods to solve first order equations	First order equations	Chap. 1 Sec. 1-6 Chap. 2 Sec. 07
2		First order equations	Chap. 2 Sec.8,9,10
3		Reduction of order	Chap. 2 Sec. 11
4, 5	To introduce the classical methods to solve second order equations	Second order equations	Chap. 3 Sec 14,15
6		Use of a known solution	Chap. 3 Sec. 16
7-11		Various methods to solve differential equations and Euler Equation	Chap. 3 Sec.17,18,19
12, 13		Higher Order Equations and Operator Methods	Chap. 3 Sec. 22,23
14-16		Series Solutions	Chap. 5 Sec 26 to 30
17, 18	To introduce Series Solutions method to 2 <sup>nd</sup> order diff. Equation with variable coefficients	Hypergeometric equation	Chap. 5 Sec 31
19, 20		Legendre Polynomials	Chap. 8 Sec44,45
21		Hermite and Chebyshev polynomials (Any one)	Chap 5 Appendix B & D
22-24		Bessel functions	Chap. 8 Sec. 46,47
25, 26		Eigenvalues and eigen functions, Sturm-Liouville Problems	Chap. 7 Sec.40,43
27, 28	To introduce systems of equations	Systems of equations	Chap. 10 Sec.54,55,56
29-32	Use LT to solve DE and IE	Laplace Transforms	Chap. 9 Sec. 48,49, 50,51,53
32		Eulclidean spaces, Piecewise Continuous functions, Bessel Inequality	8.1-8.4(RB) 9.1-9.2(RB)
33-38	To introduce F series	Fourier Series	Chap. 6 Sec.33,34, 35,36



39, 40	To introduce classical methods to solve PDE	One dim. Wave equation	Chap 7 Sec 40	310-5
41		One dim. Heat equation	Chap 7 Sec 41	
42		Laplace's equation	Chap 7 Sec 42	

\* The lectures may be slightly diverge from aforesaid plan based on students' background & interest in the topic, which may perhaps include special lectures and discussions that would be planned and schedule notified accordingly.

#### Evaluation Scheme:

EC No	Evaluation Components	Nature of Component	Duration	Weightage%	Date, Day & Time	Venue
1	Test-1	Close Book	50 minutes	25 %	04 03 13 Monday 2 <sup>nd</sup> Hr	To be announced later
2	Quiz-1	Close Book	20 minutes	08 %	25 03 13 Monday 2 <sup>nd</sup> Hr	
3	Test-2	Open book*	50 minutes	20 %	22 04 13 Monday 2 <sup>nd</sup> Hr	
4	Quiz-2	Close Book	20 minutes	07 %	20 05 13 Monday 2 <sup>nd</sup> Hr	
5	Compre Exam	Close Book	3 hours	40 %	02 06 13 Sunday(12.30-3.30)	

\* Only prescribed text book(s) and hand written notes are permitted

#### Mid-sem Grading

Mid-sem grading will be displayed after two evaluation components or earlier when- ever about 40 % of evaluation components are completed

**Note:** A student will be likely to get "NC", if he / she

- Doesn't appear / appear for the sake of appearing for the evaluation components / scoring zero in pre-compre total.

#### Makeup and Attendance policies:

**Make-ups** are not given as a routine. It is solely dependent upon the genuineness of the circumstances under which a student fails to appear in a scheduled evaluation component. In such circumstances, prior permission should be obtained from the Instructor-in-Charge (I/C). The decision of the I/C in the above matter will be final.

**Attendance:** Every student is expected to be responsible for regularity of his/her attendance in class rooms and laboratories, to appear in scheduled tests and examinations and fulfill all other tasks assigned to him/her in every course. A student should have a minimum of 50% of attendance in a course to be eligible to appear for the Comprehensive Examination in that course. For the students under the purview of Academic Counseling Board (ACB), the Board shall prescribe the minimum attendance requirement on a case-to-case basis. Attendance in the course will be a deciding factor in judging the seriousness of a student which may be directly / indirectly related to grading.

#### General timings for consultation:

Each instructor will specify his / her chamber consultation hours during which the student can contact him / her in his / her chamber for consultation. (For details see part II)

#### General Instructions:

Students should come prepared for classes and carry the text book(s) or material(s) as prescribed by the Course Faculty to the class.

#### Notices:

All notices concerning the course will be displayed on the respective Notice Boards.

**Dr. S.Baskaran**  
Instructor-In-Charge

#### Contact Details

Dr. Priti Bajpai, (PBP) Professor  
Contact details: Chamber No: G14 Contact No. +9714-4200700 Ext.115 email: [priti@bits-dubai.ac.ae](mailto:priti@bits-dubai.ac.ae)

Dr. K.Kumar, (KMR) Associate Professor  
Contact details: Chamber No: G13 Contact No. +9714-4200700 Ext. 114 email: [kumar@bits-dubai.ac.ae](mailto:kumar@bits-dubai.ac.ae)

Dr. A.Somasundaram, (SSA) Associate Professor  
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Dr.S.Baskaran, (BKN) Assistant Professor,  
Contact details: Chamber No. 135, Contact No.+9714-4200700 Ext.226, email: [baskaran@bits-dubai.ac.ae](mailto:baskaran@bits-dubai.ac.ae)



**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**SECOND SEMESTER 2012-2013**

CCH:- M4

**Course Handout (Part II)**

Date: 03.02.2013

In addition to part-I (General Handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

**Course No** : GS F245 ( 3 )  
**Course Title** : Effective Public Speaking  
**Instructor-In-charge** : Dr. Shazi Shah Jabeen  
**Instructors** : Dr. Shazi Shah Jabeen

**Scope and objective of the course:**

The main objective of the course is to improve the students' spoken English and enable them to acquire the art of public speaking. The course is heavily practice oriented and has been designed to develop the skills of speech through presenting papers, giving seminars, participating in group discussions and appearing at interviews, etc.

**Course Pre/Co- requisite (if any)& Catalogue / Bulletin Description:** Given in the Catalogue 2012 - 2013 CD

**Study Material:**

**Text Books:**

Lata Pushp and Sanjay Kumar. *Communicate or Collapse: A Handbook of Effective Public Speaking, Group Discussion and Interviews*. New Delhi: Prentice Hall of India. 2007.

**Reference books:**

- i. Lucas, Stephen E. *The Art of Public Speaking*. 9<sup>th</sup> edition. McGraw-Hill. 2004.  
 ( with CD-ROM )
- ii. Hamlin, Sonya. *How to Talk so People Listen*. New York: Throson, 1993.

**Course plan:**

Lec. No.	Learning objectives	Contents	References@ (Chapters)
1	To give an overview of public speaking	Public Speaking: an Overview	1
2	To discuss the strategies students can choose to overcome stage fright	Combating Nervousness	2
3	To develop critical and constructive listening skills	Listening Effectively	3
4	To focus on the role of nonverbal communication in speech making	Using Body and Voice to Communicate	4
5	To show how students can gather their own materials and then organize them	Preparing and Organizing the Material	5
6	To introduce the basic principles of audience analysis and explain how to adapt a speech to an audience.	Sizing Up Your Audience	6
7	To teach students how to prepare an outline	Preparing an Outline	7
8	To explain the advantages and kinds of visual aids and the ways to use visual aids most effectively	Using Visual Aids	8
9	To enable students to develop and use supporting material	Employing Supporting Material	9
10-12	To guide students through the crucial process of drafting effective introductions and conclusions	Casting Effective Introductions and Conclusions	10
13	To highlight the importance of wit and humour in speech making	Using Wit and Humour	14
14	To teach the strategies of persuading people without pushing them	Persuading without Pushing	13
15	To study sample speeches to understand how speeches are made effective.	Speeches for Analysis and Discussion	15
16-45	To give practice to students for improving their listening and speaking skills by making speeches	Lab Practice	11, 12, 13, 16, 17

\* The lectures may be slightly diverge from aforesaid plan based on students' background and interest in the topic, which may perhaps include special lectures and discussions that would be planned and schedule notified accordingly.



10 M: Listening  
15 X 3: Speeches

**Evaluation Scheme:**

EC No	Components	Duration	Weightage%	Date & Time	Venue
1	Test 1	50 minutes	15%	24.03.13 Su1	To be announced later
2	Test 2 / Speech	5 - 7 minutes	15%	To be announced later	
3	Class Assignments (10+15x2)* (Presentation and Participation) (max. 3-4 mins)	To be announced later	40%	To be announced later	
4	Compre Exam	3 hours	30%	30.05.13 Th (AN)	

\* **Assignments** : The Assignments will be given / conducted on either some or all of the above mentioned topics. Assignments(s) may include listening, presentation, prepared and impromptu speeches.

Details will be intimated through a separate notification or announced in the class and the deadlines would be indicated therein. However all assignments would be completed by 2<sup>nd</sup> week of May, 2013. It is necessary that students stick to time schedule and do not postpone submission of assignments. This will prevent extra load during last two weeks of class work. No make-ups would be allowed for submission of assignments.

**Reading Assignments**: Students are advised to read, collect additional information on the above mentioned topics as per given schedule. In addition, awareness w.r.t. latest developments in the area would be an added advantage.

**Mid-sem Grading:**

Mid-sem grading will be displayed after two evaluation components or earlier when- ever about 40 % of evaluation components are completed.

**Note:** A student will be likely to get "NC", if he / she

- Doesn't appear / appear for the sake of appearing for the evaluation components / scoring zero in pre-compre total.

**Makeup and Attendance policies:**

**Make-ups** are not given as a routine. It is solely dependent upon the genuineness of the circumstances under which a student fails to appear in a scheduled evaluation component. In such circumstances, prior permission should be obtained from the Instructor-in-Charge (I/C). The decision of the I/C in the above matter will be final.

**Attendance**: Every student is expected to be responsible for regularity of his/her attendance in class rooms and laboratories, to appear in scheduled tests and examinations and fulfill all other tasks assigned to him/her in every course. A student should have a minimum of 50% of attendance in a course to be eligible to appear for the Comprehensive Examination in that course. For the students under the purview of Academic Counseling Board (ACB), the Board shall prescribe the minimum attendance requirement on a case-to-case basis. Attendance in the course will be a deciding factor in judging the seriousness of a student which may be directly / indirectly related to grading.

**General timings for consultation:**

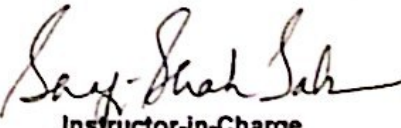
Each instructor will specify his / her chamber consultation hours during which the student can contact him / her in his / her chamber for consultation. (For details see part II)

**General instructions:**

Students should come prepared for classes and carry the text book(s) or material(s) as prescribed by the Course Faculty to the class.

**Notices:**

All notices concerning the course will be displayed on the respective Notice Boards.

  
Instructor-in-Charge  
Dr. Shazi Shah Jabeen  
ENGL C353

**Contact details**

Name: Dr. Shazi Shah Jabeen

Designation: Associate Professor

Contact details: Chamber No: 128 Contact No: +9714 4200700 Ext. 219 email: [shazi@bits-dubai.ac.ae](mailto:shazi@bits-dubai.ac.ae)

Mobile No: +971 50 3568318



**BITS Pilani, Dubai Campus**  
**Course Handout**  
**Third Year (2013-14)**



# BITS PILANI, DUBAI CAMPUS

## INSTRUCTION DIVISION

First Semester 2013 – 2014

### Course Handout (Part – II)

Date: 02.09.2013

In addition to Part I (General Handout for all courses appended to the Time Table) this portion further specific details regarding the course.

**Course No.** : EEE F311 / ECE F3111 (3 1 4)  
**Course Title** : Communication Systems  
**Course Instructors** : Dr. TG Thomas, Dr. Abdul Rajak, Prof. S Swaminathan, Dr. AB Chattopadhyay, Dr. Jagadish Nayak  
**Instructor-in-charge** : Dr. TG Thomas

### Scope and Objective of the Course

The course introduces the principles and practices of modern analog and digital communication systems. Students will be introduced to the functioning of modern communication systems and how they perform in the presence of noise. Students will be given assignments on communication system modeling using MATLAB. The laboratory component involves system design and simulation exercises using MATLAB and Simulink. Students registering in this course are expected to have a good understanding of the topics covered in signals and systems, Probability & Statistics & base level mathematics.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description** Given in the Catalogue 2013 – 2014 CD

### Text book (TB)

T1 B.P. Lathi and Zhi Ding, *Modern Digital and Analog Communication Systems*, 3<sup>rd</sup> or 4<sup>th</sup> Edition, Oxford University Press, 2010

T2 Simon Haykin & Michael, Moher, *Communication Systems*, 4<sup>th</sup> or 5<sup>th</sup> Edition, John Wiley & Sons, 2010

### Course Plan / Schedule

Sl. #	Learning objectives	Topics to be covered	Chapter No	No. of lectures
1.	Overview of the course, introduction to communication systems.	History of electronic communications, block diagram.	T1& T2:Ch.1	2
2.	Deterministic and random signals and their properties	Classification of energy and power signals, correlation functions, power and energy spectral densities, review of Fourier series and Fourier Transforms, signal distortions.	T1: Ch. 2 & 3 T2:Ch. 2	4
3.	Amplitude modulation (AM)	DSB-SC, SSB-SC, VSB signals, Generation and demodulation of AM signals, modulator and modulator circuits, Frequency Division multiplexing	T1:Ch. 4 T2:Ch. 3	4
4.	Phase & Frequency modulation	Angle modulation, FM transmitter and receivers, interference and bandwidth considerations, comparison of AM and FM, FM generation and demodulation.	T1:Ch. 5 T2:Ch. 4	4
5.	Random variables & processes.	Probability, Random variables & processes, statistical averages, Power spectral density, Gaussian process and Noise	T1:Ch. 8,9 T2:Ch. 5	3
6.	Noise on Analog modulation systems	Effect of noise on AM and FM signals, performance of analog communication systems in the presence of noise	T2:Ch. 6	4



7.	Digital Representation of Analog Signals	Sampling theorem, aliasing, quantization and encoding, PAM, TDM, PPM, PWM, Quantization, PCM, Delta Modulation	T1:Ch. 6 T2:Ch. 7	4
8.	Baseband Transmission of Digital Signals	Matched Filter, Probability of error due to Noise, Inter Symbol Interference (ISI), eye diagram, Nyquist Criterion for Distortionless transmission, pulse shaping	T1:Ch. 7,10 T2:Ch. 8	4
9.	Band-Pass transmission of Digital signals	Band-Pass Transmission Model, Binary PSK & FSK, M-Array Data Transmission Systems, Noise performance of PSK & FSK Systems	T2:Ch. 9	4
10.	Information & Forward Error Correction	Measure of information, entropy, Source Coding Theorem, discrete memory less channels, Channel capacity & Channel Coding, Error Control Codes, Linear block & convolutional codes	T1:Ch. 13 T2:Ch. 10	4
11.	Introduction to Spread spectrum systems	Concept of spread spectrum, PN sequences and their use in communication systems,	T1: Ch. 11	2
12.	Emerging Trends in Communication Systems: Optical and Mobile communications.	A brief overview of different communication technologies	Supplementary notes	4
<b>Total no. of classes planned</b>				<b>43</b>

**Laboratory component** Experiments will be conducted using HW boards, Signal Sources, Oscilloscopes & Spectrum Analyzer. Laboratory exercises will also involve simulations using MATLAB.

**Evaluation scheme**

EC NO	Evaluation Components	Nature of Component	Duration	Weightage	Date	Time & Venue
1	Test-I	Closed Book	50 minutes	15%	09/10/2013 (W6)	To be announced (TBA) later
2	Quiz-1	Closed book	20 minutes	05%	25/09/2013 (W6)	
3	Test - 2	Open book*	50 minutes	15%	04/11/2013 (M2)	
4	Quiz - 2	Closed book	20 minutes	05%	11/12/2013 (W6)	
5	Laboratory	Weekly Practicals	-	15%	Continuous Evaluation	
		Lab Compre.	2 hours	15%	TBA	
6	Compre Exam	Closed Book	2 hours.	30%	09/01/2014 (AN)	

\* Only prescribed text book(s) and hand written notes are permitted

**General Instructions, Attendance & Make-up Policies, etc:** Please refer the Time Table

**Timings for chamber consultation:**

Students should contact the Course Instructor in his / her chamber during the CCH for consultation: Monday 8<sup>th</sup> Hour

**Notices:**

All notices will be displayed on the 3<sup>rd</sup> year Notice Board.

**Dr. TG Thomas**  
**Instructor – In- Charge**

**Instructors' Contact Details:**

Dr. TG Thomas, Chamber No: G-10, Mob No. 050 2195570 Email: thomas@dubai.bits-pilani.ac.in  
 Dr. Abdul Rajak, Room 282, Mob No.: 050 9563993 Email: abdulrazak@dubai.bits-pilani.ac.in  
 Dr. S. Swaminathan, Room 289, Mob No.: 055 6953629  
 Dr. AB Chattopadhyay, Room 134, Mob No.: 050 8410276  
 Dr. Jagadish Nayak, Room 330, Mob No. 055 4907979



# BITS PILANI, DUBAI CAMPUS

## INSTRUCTION DIVISION

First Semester 2013 – 2014

### Course Handout (Part – II)

Date: 02.09.2013

*In addition to Part I (General Handout for all courses appended to the Time Table) this portion further specific details regarding the course.*

**Course No.** : ECE F314 (3 0 3)  
**Course Title** : Electromagnetic Fields and Microwave Engineering  
**Course Instructors** : Dr. A. R. Abdul Rajak  
**Instructor-in-charge** : Dr. A. R. Abdul Rajak

#### Scope and Objective of the Course:

The objective of this course is to provide the students with the basic understanding of electromagnetic waves and Microwave engineering. The material covered in this course is basic to the training of electrical engineers.

#### Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:

*Given in the Catalogue 2013 – 2014 CD*

#### Text book [TB]:

1. Kraus/Fleisch "Electromagnetics with applications", 5th ed., McGraw-Hill New York, 1999. (T1)
2. Samuel Y. Liao, "Microwave devices and circuits" 3<sup>rd</sup> ed., PHI 2008. (T2)

#### Reference book(s) [RB]:

1. David K. Cheng, "Field and Wave Electromagnetics" 2<sup>nd</sup> ed. Pearson Education, New Delhi, 2009 (RB)
2. Matthew N. O. Sadiku, "Principles of Electromagnetics" 4<sup>th</sup> ed. Oxford University Press, New Delhi, 2009. (RB)
3. EDD Notes: "Smith Chart and its Applications", BITS, Pilani, 2009. (RB)
4. Annapurna Das and Sisir Das, "Microwave Engineering", TMH 2009. (RB)

#### Course Plan / Schedule:

Sl.#	Learning objectives	Topics to be covered	Chapter No	No. of lectures
1.	Introduce the fundamental concepts culminating in Maxwell's Equations	Maxwell's Equations, Constitutive relations and Boundary Conditions Time-varying Fields	(1, 2-T1) &(2-T2)	3
2.	Understand the propagation of waves through space and various kinds of media	Plane wave propagation in conducting and dielectric media	(4.2-4.6 T1) & (2.5-T2)	3
3.	To understand the plane wave at interface and analogous transmission lines, Radar absorbing material	Plane Waves at interfaces, phase and group velocity	(4.7-4.9- T1) & (2.3-T2)	3
4.	How energy is stored and transmitted by EM wave	Energy relations and Poynting Vecto	(4.10-T1)& (2.2-T2)	3
5.	Understand various types of polarization of EM waves.	Wave polarization	(4.11-4.12 - T1) & class notes	3
6.	Behaviour of plane waves at the interface between two media	Reflection & refraction of plane waves	(4.14 -T1) & class notes	3
7.	Analysis of transmission lines and their circuit behaviour	Transmission lines	(3.4 -T1)& (3-T2)	3
8.	How to solve transmission line problems using Smith Chart	Impedance matching	(3.4-3.5-T1) &(3-T2)	3
9.	General Wave behaviour along uniform guiding structures, TEM waves, TM waves, TE waves	Waveguides	(8.1-8.3-T1) & class notes	3
10.	Study of Radiation Mechanism and Antennas construction , Antenna parameters, basic antenna elements,	Introduction of Antennas	(5.1 -T1) & class notes	3



	Antenna Equivalent circuit			
11.	Antenna parameters, basic antenna elements, Antenna Equivalent circuit, Antenna arrays, Antenna patterns, Small loop antenna, Slot antenna, Horn antenna, Helical antenna and Log periodic antenna	Antennas and Antennas Arrays	(5.2-5.3-T1) & classnotes	3
12.	Retarded Potential, Hertzian dipole, Half wave dipole	Dipole antennas	(5.4-5.9 -T1) & classnotes	3
13.	Microwave hybrid circuits, Directional couplers, Circulators and Isolators.	Microwave Passive circuit elements	(4.3- 4.5-T2) class notes,	3
14.	Klystron, multi cavity klystron , reflex klystron and traveling wave tubes and Magnetron Gunn diode, IMPATT diode, TRAPATT diode and parametric amplifier Microwave measurements	Microwave Semiconductor devices and Microwave measurements	(5.3&7.1, 8.2,8.3,9.2,9.4,9.5,10.1-T2) & class notes,	3
Total no. of classes planned				42

**Evaluation scheme:**

EC No	Evaluation Components	Nature of Component	Duration	Weightage %	Date & Time	Venue
1	Test-1	Closed Book	50 minutes	25	30.09.13	To be announced later
2	Quiz-1	Closed book	20 minutes	08	10.10.13	
3	Test - 2	Open book*	50 minutes	20	01.12.13	
4	Quiz - 2 / Assignment	Closed book	20 minutes	07	11.11.13	
5	Compre Exam	Closed Book	3 hours	40	26.12.13 M (AN)	

\* Only prescribed text book(s) and hand written notes are permitted

**General Instructions, Attendance & Make-up Policies, etc:**  
Please refer the Time Table

**Timings for chamber consultation:**

Students should contact the Course Instructor in his / her chamber during the CCH for consultation.  
Su 7

**Notices:**

All notices will be displayed on the 3<sup>rd</sup> year Notice Board.

Dr. A. R. Abdul Rajak  
Instructor – In- Charge

**Instructor's Contact details**

Dr A. R. Abdul Rajak, Asst Prof, Chamber No. 282, EXTN no'346 Contact No: 050-9563993  
e-mail: abdulrazak@bits-dubai.ac.ae



**BITS PILANI DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**First Semester 2013– 2014**

**Course Handout (Part II)**

**Date: 01/09/2013**

In addition to Part I (General Handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

**Course No** : EEE C415 / EEE F434  
**Course Title** : Digital Signal processing  
**Course Instructor** : Dr. Mary Lourde R  
**Instructor – in - Charge** : Dr. Mary Lourde R

**Course Description:**

This course deals with the design of analog filters like Butterworth, Chebyshev, Elliptic and digital filter design for both IIR & FIR filters. Different filter structures for the realization of digital filters will be discussed. Multirate DSP and adaptive signal processing will be introduced. DSP Processor architecture and implementation of DSP algorithms will be part of the course which will be emphasized upon.

**Scope and Objective:**

This course is intended as a first course in Digital Signal Processing. Typically in final year under graduate level or first year graduate level. Some elementary knowledge of signals and circuits is necessary. It is assumed students know Fourier series, Laplace transform etc..

The course aims at enumerating the theoretical and practical aspects of modern signal processing in digital environment. It also aims at discussing application areas with particular stress on speech and image data.

**Text Book:**

TB1. "Digital Signal Processing: A Computer Based Approach", S K Mitra, TMH, 3<sup>rd</sup> ed. 2006.

**Reference Books:**

- \*RB1. "Digital Signal Processing: A Practical Approach", Emmanuel C Ifeachor & Barrie W. Jervis, Pearson Education Asia, Second Ed., 2003.
- RB2. "Digital Signal Processing : Principles, Algorithms and Application", John G Proakis & D G Manolakis, PHI, 1998
- RB3. "Digital Signal Processors: Architecture, Programming and Applications", B. Venkataramani & M Bhaskar, TMH, 2002.
- RB4. TI DSP Processor User Manuals

**Bulletin Description: 3 0 3**

Introduction: Design of analog filters, design of digital filters, (IIR, FIR), structures for the realization of digital filters, random signals and random processes, linear estimation and prediction, Weiner filters, DSP Processors architecture, DSP algorithms for different applications.

**Course Pre-requisites:** EEE / INSTR C 272 , Circuits & Signals

**Course Plan / Schedule:**

Lecture No	Learning Objectives	Topics to be covered	Reference
1	Overview of the course	Introduction	-----
2	Review Of Analog Filters	Introduction to analog filters	-----
3	Analog Filter Design Techniques	Butterworth Filter	TB1 4.4, 4.5 RB1 8.9
4	Analog Filter Design Techniques	Chebyshev Filters	
5	Analog Filter Design Techniques	Elliptic & Bessel Filters	
6	Analog filter design	Design of HP, BP and BS filters	4.5
7	Sampling	Sampling lowpass & bandpass signals	4.2, 4.3
8,9	Concepts of Digital Filter design	Digital Filter Design – IIR	TB1 ch. 7, RB1 8.4 – 8.6
10	Concepts of Digital Filter design	Bilinear transformation	TB1 7.2 RB1. 8.8 – 8.9
11,12	Concepts of Digital Filter design	Design Problems	TB1 7.3, 7.4



13	Concepts of Digital Filter design	FIR filter Design	TB1 7.6 RB1 7.1 - 7.4
14,15	Concepts of Digital Filter design	FIR Filter Design using windows	TB1 7.7 RB1 7.5
16	Concepts of Digital Filter design	Optimal Method	RB1 7.6
17	Concepts of Digital Filter design	Frequency Sampling Method	RB17.7
18	Realization of Digital Filters	IIR Filters	TB1 6.4 RB1 6.4, 8.13
19	Realization of Digital Filters	FIR Filters	TB1 6.3 RB1 6.4, 7.10
20	Finite Word-Length Effects	IIR, FIR	TB1 9.1-9.7 RB1 8.14, 7.11, 13.4
21	Overview of Programmable DSPs	Introduction to DSPs	RB3 / RB4
22	DSP Architectures	Basic concepts, Terminology, Data Types	RB3 2.1-2.8
23, 24	DSP Architectures	Architecture of TMS 320C5x	RB3 3.1 - 3.14
25, 26	Addressing Modes	Addressing Modes	RB3 4.2
27, 28	Programming DSPs	Instruction Set	RB3 4.3 - 4.9
29	Exercises	Example Programs	RB3 / RB4
30	Advanced Concepts	Pipelining in C54x	RB3 5.1 - 5.3
31	Advanced DSPs	Overview of TMS 320C6x	RB3
32	Multi rate DSP	Introduction	TB1 CH 10 RB19.1
33	Multi rate DSP	Decimation & Interpolation	TB1 10.2 RB19.2
34,35	Multi rate DSP	Multistage Implementation	TB1 10.3 RB19.2, 9.3
36,37	Multi rate DSP Applications	Subband Coding, Filter banks, Wavelets	TB1 10.6
38	Adaptive Digital Filters	Introduction and Concepts of Adaptive filtering, Wiener Filters	RB1 10.1 - 10.3
39	Adaptive algorithms	Basic LMS algorithm	RB110.4
40	Adaptive algorithms	RLS algorithm	RB110.5
41,42	Applications	Examples	TB1 11.5

#### Evaluation Scheme:

EC No.	Evaluation Component	Nature of Component	Duration (min)	Weightage (%)	Date & Time
1	Test I	Closed Book	50	15	13.10.13 Su / 3
	Quiz 1	Closed Book	20	5	To be announced
2	Test II	Open Book*	50	15	10.11.13 Su / 3
3	Quizz 2	Open Book	15	5	To be announced
4	Computer Assignments <sup>a</sup> Tutorials	Open Book	----	20	To be announced
5	Compre. Exam	Closed Book	180	40	29.12.13 Sun AN

\* Only prescribed text book(s) and hand written notes are permitted

<sup>a</sup>Assignments will be computer based, using MATLAB and its toolboxes. It also has a part as presentations on topics related to signal processing.

**General Instructions, Attendance & Make-up Policies, etc:** Please refer the Time Table

#### Timings for chamber consultation:

Students should contact the Course Instructor in her chamber during the CCH for consultation.

**Notices:** will be displayed on the IV<sup>th</sup> year EEE / EIE/ ECE notice board

(Dr. Mary Lourde R)  
Instructor -in -Charge  
EEE C415 / EEE F434

#### Contact Details:

Dr. Mary Lourde R., Associate Professor ( EEE ), Room No. A 204,  
Contact Tel : + 971 50 6973143; Email id : marylr@bitsdubai.com



**BITS PILANI DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**First Semester 2013– 2014**

**Course Handout (Part II)**

**Date: 02/09/2013**

In addition to Part I (General Handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

**Course No** : EEE F422  
**Course Title** : Modern Control Systems  
**Course Instructor** : Dr. Mary Lourde R  
**Instructor – in - Charge** : Dr. Mary Lourde R

**1. Scope & Objective of the Course:**

Feedback automatic control systems are indispensable in industrial processes, scientific instruments and even commercial, social and management situations. Most of these systems are non linear in nature. Analysis and design of these non linear systems is the very important task that an engineer has to carry out. This course mainly focuses on various advanced control techniques.

**2. Text Book:** Nagrath I. J. and M. Gopal, Control Systems Engineering, New Age International (P) Ltd, 5<sup>th</sup> ed, 2007.

**3. Reference Book:**

M. Gopal, Modern Control System Theory, New Age International (P) Ltd, 2<sup>nd</sup> ed.

**4. Course Plan:**

Lect. No	Topic	Learning object(s)	Ref. to Text Book/ Class Notes
1.	Introduction	General overview of the course	
2.	State variable analysis;	Understanding of concept of state, state variable and state model	12.1,12.2
3-5.	State model for LTC system	Determination of state model for LTC systems	12.3
6.	Diagonalization	To understand the transformation of state model into a canonical form	12.5
7-8.	State equation, transition matrix	To solve state eqs and computation of transition matrix	12.6
9-10.	Controllability and observability	To understand the concept of controllable and observable system	12.7
11.	Pole placement	Understanding the effects of pole placement and pole zero cancellation	12.8
12.	Digital Control System; Spectrum analysis of sampling process ; signal reconstruction	Understanding of basics of digital control system	11.1,11.2,11.3
13-14.	Difference equations; Z Transform; Inverse Z Transform	Determination of Z, inverse Z transform and DE	11.4,11.5,11.7
15-16.	Z transform analysis of sampled data control system	Analysis of sampler and hold circuits	11.6,11.8
17-18	z and s domain relationship, stability analysis	Investigation of stability using various methods	11.9-11.10
19.	Compensation Techniques	Application of compensation techniques for Sampled data control systems.	11.11
20-22.	Closed loop frequency response, Constant M and N circles	Investigation of closed loop system stability using their closed loop frequency plots.	9.5,9.6
23.	State variables and Linear discrete time systems	State variable method for analysis and design of linear discrete time systems	12.4,12.6,12.8
24.	Liapunov's stability analysis	Understanding of Liapunov's method of stability	13.1-13.4



26.		analysis and its applications	
27.	Nonlinear systems; common physical nonlinearities	Understanding of behavior of non linear systems	15.1, 15.2
28.	Phase Plane Method, singular points	Basic understanding Phase Plane Method, singular points	15.3, 15.4
29.	Stability of nonlinear systems, Limit Cycles	Investigation of stability of non linear systems	15.5
30-31.	Phase Plane Trajectories	Construction of phase plane trajectories and its application to stability analysis	15.6
32-34.	Describing functions,	Derivations of describing functions and its application to stability analysis	15.7-15.9
35.	Adaptive control	Basics of Adaptive control	16.2, class notes
36-40.	Application of Modern Control Techniques	Intelligent Control using ANN, Fuzzy, Genetic Algorithm in various fields	Class notes

#### Evaluation Scheme:

EC No.	Evaluation Component	Nature of Component	Duration (min)	Weightage (%)	Date & Time
1	Test I	Closed Book	50	15	10.10.13 W/5
2	Quiz 1	Closed Book	20	10	To be announced
3	Test II	Open Book*	50	15	08.11.13 W/5
4	Computer Assignments/ Tutorials	Open Book	----	20	To be announced
5	Compre. Exam	Closed Book	180	40	07.01.14 S / AN

\* Only prescribed text book(s) and hand written notes are permitted

@Assignments will be computer based, using MATLAB and its toolboxes. It also has a part as presentations on topics related to Modern Control Systems.

**General Instructions, Attendance & Make-up Policies, etc:** Please refer the Time Table

#### Timings for chamber consultation:

Students should contact the Course Instructor in her chamber during the CCH for consultation.

**Notices:** will be displayed on the III<sup>rd</sup> Yr EEE / EIE/ ECE notice board

(Dr. Mary Lourde R)  
Instructor –in -Charge  
EEE F422



**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**FIRST SEMESTER 2013 - 2014**

Course Handout (Part II)

Date: 02.09.2013

In addition to part-I (General Handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

Course No : EEE C443 / EEE F313 / INSTR F313 ( 3 0 3 )  
 Course Title : ANALOG AND DIGITAL VLSI DESIGN  
 Instructor-in-charge : Prof. Dr. VIJAYA GUNTURU  
 Instructors : Prof. Dr. VIJAYA GUNTURU

**Scope and objective of the course:**

The objective of this course is to provide to the student an introduction to the fundamentals and practical considerations pertaining to the design of integrated circuits. The scope encompasses both analog and digital integrated circuits. The importance of CAD tools in IC system design process is also acknowledged and stressed upon.

**Course Pre/Co-requisite (if any) & Catalogue / Bulletin Description:** Given in the Catalogue 2013- 2014 CD

**Study Material:**

**Text Books:**

- [T1] Jan M. Rabaey, Anantha Chandrakasan; Borivoje Nikolić, "Digital Integrated Circuits - A Design Perspective", (Second Edition) Prentice-Hall Electronics and VLSI Series (2003)  
 [T2] Behzad Razavi, "Design of Analog CMOS integrated circuits", McGraw Hill International Edition, 2001

**Reference books:**

- [R1] Kang, S.M and Leblebici Y., "CMOS Digital Integrated Circuits: Analysis and Design, McGraw Hill International Editions 3<sup>rd</sup> Edition 2003  
 [R2] Johns, David A. and Martin K, "Analog Integrated Circuit Design," John Wiley & Sons Inc. 2002.  
 [R3] Michael, L. Bushnell, and Vishwani, D. Agrawal, "Essentials of Electronic Testing For Digital, Memory And Mixed Signal VLSI Circuits. Kluwer Academic Publishers, Third Edition, 2004  
 [R4] Sedra, A.S. and Smith, K.C. "Microelectronics Circuits: Theory and Applications"

**Course plan:**

Lec. No.	Learning objectives	Contents	References@ (Chapters)
<b>Common Topics</b>			
1-2	Introduction to the semiconductor industry	Introduction to VLSI Design Methodologies	T1(1); R1(1)
3-4	Technology Generation transition n and its effects on performance	Scaling	T1(3); R1(3); R2(3)
5-7	Introduction to layouts and industry design flow for analog and digital integrated circuits	CMOS Technology, Design Rules, MOS Capacitances	T1(2); R2(1)
<b>Analog Design</b>			
8-13	Building temperature independent voltage and current references	Advanced Current Sources & sinks; Current Reference circuit	T2(6); R2(6)
14-19	Basic building block for most analog subsystems	Operational amplifiers Architectures, feed back	T2(7)
20-23	Quantification of various types of noise in analog circuits	Noise	T2(7)
<b>Digital Design</b>			
24-28	Basic building block for most digital sub-systems and Speed of digital systems Study and design of various CMOS logic gate families	MOS inverter- Static and switching characteristics, Combinational MOS logic circuits -static logic	R1(5); T1(6); R1(7); T1(7)
29-34	Synchronous design, timing metrics, Design of flip-flops	Synchronous system and Sequential circuits design	R1(8); T1(9)



20% → 10% + 7% + 3%  
Seminar/Project Quiz 2 Reading Assignment

Lec. No.	Learning objectives	Contents	References@ (Chapters)
35-39	Design of SRAM, DRAM, decoders, sense amplifiers	Memory Circuits Design	R1(10); T1(10)
40-44	Verification of functionality, manufacturing defects	Design verification & test	R3 and Internet sources

\* The lectures may be slightly diverge from aforesaid plan based on students' background & interest in the topic, which may perhaps include special lectures and discussions that would be planned and schedule notified accordingly.

**Evaluation Scheme:**

EC No	Components	Duration	Weightage%	Date & Time	Venue
1	Test I – Closed Book	50 mts.	10%	02.10.2013 (W5)	TBA
2	Test II – Open Book	50 mts.	20%	06.11.2013 (W5)	
3	Seminar / Project	TBA	20%	TBA	
4	Quiz/ Assignments	20 mts./TBA	10%	13.10.13 TBA	
5	Comprehensive Exam	3 hrs.	40%	05.01.2014 (W5)	

\* Only prescribed text book(s) and hand written notes are permitted.

**Assignment / Practical / Field / Case Studies:** The Assignment / Practical will be given / conducted on either some or all of the above mentioned topics. Case studies, interpretation of data and then analysis, will form a part of all evaluation components. Assignments(s) may include seminar presentation and viva.

Details will be intimated through a separate notification or announced in the class and the deadlines would be indicated therein. However all assignments/reports would be completed by 2<sup>nd</sup> week of Dec., 2013. It is necessary that all students stick to time schedule and do not postpone submission of assignments/reports. This will prevent extra load during last two weeks of class work. No make-ups would be allowed for submission of assignments / practical reports.

**Reading Assignments:** Students are advised to read, collect additional information on the above mentioned topics as per given schedule. In addition, awareness w.r.t. latest developments in the area would be an added advantage

**Mid-sem Grading:**

Mid-sem grading will be displayed after two evaluation components or earlier when- ever about 40 % of evaluation components are completed.

**Note:** A student will be likely to get "NC", if he / she

- Doesn't appear / appear for the sake of appearing for the evaluation components / scoring zero in pre-compre total.
- Scoring zero in the lab component / Abstaining from lab classes throughout.

**Makeup and Attendance policies:**

**Make-ups** are not given as a routine. It is solely dependent upon the genuineness of the circumstances under which a student fails to appear in a scheduled evaluation component. In such circumstances, prior permission should be obtained from the Instructor-in-Charge (I/C). The decision of the I/C in the above matter will be final.

**Attendance:** Every student is expected to be responsible for regularity of his/her attendance in class rooms and laboratories, to appear in scheduled tests and examinations and fulfill all other tasks assigned to him/her in every course. A student should have a minimum of 50% of attendance in a course to be eligible to appear for the Comprehensive Examination in that course. For the students under the purview of Academic Counseling Board (ACB), the Board shall prescribe the minimum attendance requirement on a case-to-case basis. Attendance in the course will be a deciding factor in judging the seriousness of a student which may be directly / indirectly related to grading.

**General timings for consultation:**

Each instructor will specify his / her chamber consultation hours during which the student can contact him / her in his / her chamber for consultation. (For details see part II)

**General instructions:**

Students should come prepared for classes and carry the text book(s) or material(s) as prescribed by the Course Faculty to the class.

**Notices:**

All notices concerning the course will be displayed on the respective Notice Boards.

Instructor-in-Charge  
EEE C443 / EEE F313

**Contact details**

Name: Prof. Dr. Vijaya Gunturu; Designation: Dean, Research and Consultancy  
Contact details: Chamber No: G-12; Contact No: +9714 4200700 Ext. 113 email: [dr\\_gv@bits-dubai.ac.ae](mailto:dr_gv@bits-dubai.ac.ae)  
Mobile No: +971 – 50 – 3757081



# BITS PILANI, DUBAI CAMPUS

## INSTRUCTION DIVISION

First Semester 2013-2014

Course Handout (Part – II)

Date: 02.09.2013

In addition to part I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : MATH F212 / AAOC C222

Course Title : Optimization

Course Instructor(s) : Dr. T.K. Datta

Instructor-in-charge : Dr. T.K. Datta

### Scope and Objective of the Course:

An optimization problem in its simple form is one in which some entity with or without being subjected to certain constraints is minimized or maximized. The entity to be optimized may be profit, cost, time, product efficiency, consumer utility, etc. The constraints may involve manpower, availability of space, raw materials, funds, machine capabilities, governmental controls, etc. There are also optimization problems with more than one objective but such problems will not be normally considered in this course. The subject of optimization is multidisciplinary in nature. Optimization Problems are encountered in physical sciences, engineering, economics, industry, planning, and many other areas of human activity. Background needed for undertaking this course is acquaintance with Calculus, Set Theory and Linear Algebra. Objective of the Course is to familiarize the student with standard methods of solving optimization problems.

### Course Pre/Co-requisite (if any) & Catalogue / Bulletin Description:

Given in the Catalogue 2012 – 2013 CD

### Text Book(TB):

T1: H.A.Taha, Operations Research: An Introduction, Pearson Education, 8th.edn, 2007.

### Reference Books(RB):

R1: Pant J.C., Introduction to Optimization: Operations Research, Jain Brothers, New Delhi, 5th.edn, 2000.

R2: Hillier and Lieberman, Introduction to Operations Research, T M H, 7th.edn; 2001.

### Course Plan / Schedule:

Sl.#	Learning objectives	Topics to be covered	Chapter No	No. of lectures
1	To learn how to form, solve and analyze Linear Programming Problems	Introduction to Linear Programming (LP) —Two-variable LP model, Graphical solution.	2.1, 2.2.1, 2.2.2	5
2	To learn how to solve LPP with all constraints which are less than or equal to	The Simplex Method, Artificial Starting Solution, Special Cases	3.1, 3.2, 3.3, 3.4, 3.5	7
3	To learn how to solve problems where solution set is required to be integers	Integer Programming	9.2.1	2
4	To learn how to solve Transportation and Assignment Problems	The Transportation Models and its Variants	5.1, 5.3, 5.4	6
5	To learn how to solve zero sum two person game of strategies	Game Theory	13.4	3



6	To learn how to form the Dual of a primal and then solve the LPP .To study different cases if changes are brought in LPP	Duality and Sensitivity Analysis	4.1 - 4.5	8
7	To study problems with Multiple Goal and Goals with priorities	Goal Programming	8.1, 8.2	2
8	To learn how to solve problems using Principle of Optimality	Dynamic Programming	10.1 ,10.2	4
9	To learn Scheduling to minimize trouble spots	Project Management with PERT/CPM	6.5	3
10	To learn how to solve non linear programming problems	Non-linear Programming	18.2.2, 19.2.2	3
11	To learn the algorithm involved in solving LPP	Simplex Method fundamentals	7.1, 7.2	2
Total number of classes planned				45

### Evaluation scheme:

EC NO	Evaluation Components	Nature of Component	Duration	Weightage	Date & Time	Venue
1	Test-I	Close Book	50 minutes	25 %	25.09.13 W	To be announced later
2	Quiz-1	Close book	20 minutes	08 %	09.10.13 W	
3	Test - 2	Open book*	50 minutes	20 %	20.11.13 W	
4	Quiz - 2	Close book	20 minutes	07 %	04.12.13 W	
5	Compre Exam	Close Book	3 hours.	40 %	02.01.14 Th (AN)	

\* Only prescribed text book(s) and hand written notes are permitted

### Mid-sem Grading:

Mid-sem grading will be displayed after two evaluation components or earlier when- ever about 40 % of evaluation components are completed.

**Note:** A student will be likely to get "NC", if he / she

- Doesn't appear / appear for the sake of appearing for the evaluation components / scoring zero in pre-compre total.
- Scoring zero in the lab component / Abstaining from lab classes throughout.

### Makeup and Attendance policies:

**Make-ups** are not given as a routine. It is solely dependent upon the genuineness of the circumstances under which a student fails to appear in a scheduled evaluation component. In such circumstances, prior permission should be obtained from the Instructor-in-Charge (I/C). The decision of the I/C in the above matter will be final.

**Attendance:** Every student is expected to be responsible for regularity of his/her attendance in class rooms and laboratories, to appear in scheduled tests and examinations and fulfill all other tasks assigned to him/her in every course. A student should have a minimum of 50% of attendance in a course to be eligible to appear for the Comprehensive Examination in that course. For the students under the purview of Academic Counseling Board (ACB), the Board shall prescribe the minimum attendance requirement on a case-to-case basis. Attendance in the course will be a deciding factor in judging the seriousness of a student which may be directly / indirectly related to grading.



**General timings for consultation:**

Each instructor will specify his / her chamber consultation hours during which the student can contact him / her in his / her chamber for consultation. (For details see part II)

**General instructions:**

Students should come prepared for classes and carry the text book(s) or material(s) as prescribed by the Course Faculty to the class.

**Notices:**

All notices concerning the course will be displayed on the 3<sup>rd</sup> year Notice Boards.



Dr. T. K. Datta  
Instructor-In-charge  
MATH F212

**Instructor's Contact Details:**

Dr. TK Datta, Associate Professor, Room No.131, Contact No. +97144200700 ext. 290  
e-mail: [dutta@bits-dubai.ac.ae](mailto:dutta@bits-dubai.ac.ae)



**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**Second Semester 2013 – 2014**

**Course Handout (Part – II)**

Date: 02.02.2014

In addition to Part I (General Handout for all courses appended to the Time Table) this portion further specific details regarding the course.

Course No. : ECE F344 (3 0 3)  
 Course Title : Information Theory and Coding  
 Course Instructors : Dr. Anand Kumar  
 Instructor-in-charge : Dr. Anand Kumar

**Scope and Objective of the Course:**

This is a discipline Engineering Course in which the basics of the coding and cryptography are covered. The course objectives are:

- i) Apply random variables and processes concepts to coding and cryptography.
- ii) Design and Analyze coding techniques.
- iii) Design and Analyze cryptography techniques.
- iv) Design basic communication systems using coding and cryptography techniques.

Parallel or prior treatment of communication principles in Communication Systems (EEE C383).

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:**

*Given in the Catalogue 2013 – 2014 CD*

**Text book(s) [TB]**

- [T1] T. M. Cover and J. A. Thomas, "Elements of Information Theory", John Wiley & Sons, New York, 1991.  
 [T2] R. Hill, "A First Course in Coding Theory", Oxford University Press, 1986.

**Reference book(s) [RB]:**

- [R1] R. Bose, "Information Theory, Coding and Cryptography", Tata McGraw-Hill, 2002.  
 [R2] S. Haykin, "Communication Systems", 4th Edition, John Wiley & Sons, New York, 2001.  
 [R3] W. Stallings, "Cryptography and Network Security", Fifth Edition, Pearson, 2011.  
 [R4] B. Schneier, "Applied Cryptography", Second Edition, John Wiley, 2002.  
 [R5] J. E. Hershey, "Cryptography Demystified", Tata McGraw-Hill, 2003.

**Course Plan / Schedule:**

Sl. #	Learning Objectives	Topics to be covered	Chapter No	No. of lectures
1.	Introduce course.	Introduction to the course		1
2.	Apply random variables and processes concepts to coding and cryptography.	Random Variables and Random Processes.	T1: Ch 1 Class Notes	2
3.	Apply random variables and processes concepts to coding and cryptography.	Entropy and Mutual Information, Fano's Inequality	R1: Ch1 T1: Ch 2	5
4.	Design and Analyze coding techniques	Information sources, source coding theorem, Kraft Inequality, Huffman Codes, Shannon-Fano-Elias,	R1: Ch1 T1: Ch5,12	3



		Universal Codes (Arithmetic, Lempel-Ziv).		
5.	Design basic communication systems using coding and cryptography techniques.	Channel Capacity, Channel Coding Theorem, Channel Capacity with Feedback, Gaussian Channel, Joint source Channel Coding and separation.	T1: Ch8,10 R1: Ch2	6
6.	Design and Analyze coding techniques.	Linear Block Codes: Properties, Hard-decision decoding, Convolution Codes: Viterbi Decoding Algorithm. Iterative Decoding, Turbo Codes, Parity Check codes.	R1: Ch3,4,6 Class Notes	9
7.	Design and Analyze coding techniques	Rate Distortion Theory, Rate Distortion Function, Random Source Codes	T1: Ch13 Class Notes	5
8.	Design and Analyze cryptography techniques	Number Theory: modular arithmetic, exponentiation and discrete algorithms. Cryptography and Cryptoanalysis: Basic Concepts, Security Issues.	R1: Ch8 R4: Ch1, 11; R5: Part II	2
9.	Design and Analyze cryptography techniques	Private Encryption Algorithms: Stream ciphers, Block Ciphers, Shannon's Theory.	R1: Ch8 R3: Ch3 Class Notes	4
10.	Design and Analyze cryptography techniques	Public Key Encryption Algorithms: Diffie-Hellman Key Distribution, RSA cryptosystem.	R1: Ch8 R5: Mod 23, 26	4
11.	Design and Analyze cryptography techniques	Message Authentication, Hashing Functions, Digital Signatures.	R1: Ch8 R3: Ch11-13	4
<b>Total number of classes planned</b>				<b>45</b>

**Evaluation scheme:**

EC No	Evaluation Components	Nature of Component	Duration	Weightage %	Date & Time	Venue
1	Test-I	Open Book*	50 minutes	20	2.3.2014 (Su5)	To be announced later
2	Test - 2	Open book*	50 minutes	25	27.4.2014 (Su5)	
3	Quizzes/ Assignments/ Lab Tutorials	Closed/Open book	15-20 minutes/ Cont	15	23.3.2014 (Su5)/ Continuous	
4	Compre Exam	Open Book*	3 hours.	40	29.5.2014 (AN)	

\* Only prescribed text book(s) and hand written *class* notes are permitted

**General Instructions, Attendance & Make-up Policies, etc:**

*Please refer the Time Table*

**Timings for chamber consultation:**

Students should contact the Course Instructor in his / her chamber 126 during the CCH for consultation.  
Wed 3<sup>rd</sup> period

**Notices:**

All notices will be displayed on the 3<sup>rd</sup> year Notice Board.



Instructor-in-Charge  
Dr. Anand Kumar

**Instructors' Contact Details:**

Dr. Anand Kumar – Chamber No: 126; Contact Tel No: 04 4200700/Ext. 217;  
Mobile No: +971 50 7225749 E-mail: [akumar@dubai.bits-pilani.ac.in](mailto:akumar@dubai.bits-pilani.ac.in)



**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**Second Semester 2013 – 2014**

**Course Handout (Part – II)**

Date: 02.02.2014

In addition to Part I (General Handout for all courses appended to the Time Table) this portion further gives specific details regarding the course.

**Course No.** : ECE C364/ ECE F341 /EEE F341/INSTR C364/INSTR F341 (3 1 4)  
**Course Title** : Analog Electronics  
**Instructor-in-charge** : Dr. V.Kalaichelvi  
**Instructors** : Dr.V.Kalaichelvi, Dr.S.Swaminathan, Dr.Abdul Rajak & Dr.R.Gomathi Bhavani

**Scope and Objective of the Course:**

The aim of the course is to deal with various electronic techniques and building blocks used in analog signal processing. Discrete and Integrated electronic circuits will be studied. Experiments using discrete IC modules will be carried out in the laboratory.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:** Given in the Catalogue 2013 – 2014 CD

**Text Books:**

- (i) L.K. Maheshwari and M.M.S. Anand, "Analog Electronics", Prentice Hall of India, New Delhi, 2005.
- (ii) A.S. Sedra, K.C. Smith, "Microelectronic Circuits", 6<sup>th</sup> Edition, Oxford, 2013.
- (iii) L.K. Maheshwari and M.M.S. Anand, "Laboratory Experiments and PSPICE Simulations in Analog Electronics", Prentice Hall of India, New Delhi, 2006.

**Reference books:**

- IEEE/IEL online database

**Course Plan:**

**Theory:**

Lec. No	Learning objectives	Contents	Chapter No
1-2	To refresh the content studied in past semesters	Introduction & Review of Concepts	TB1, Ch 1
3-7	To introduce fundamental concepts on OP-amp	Op-amp basics	TB1, Ch 2
8-10	To introduce signal Conditioning Circuits using Op-amps	Signal conditioning circuits using Op-amps*	Class Notes
11-14	To introduce important concepts like instrumentation amplifier	Special purpose opamp circuits	TB1, Ch 3
15-17	To design and study the frequency response of filter	Filters*	TB1, Ch 4 Class Notes
18-20	To design and study non linear operational amplifier	Non-linear Op-amp circuits	TB1, Ch 5, TB2 5.9
21-23	To introduce the concept of various signal sources like oscillators etc	Signal Sources & Phase lock loop	TB1, Ch 6
24-27	To design and study the concept of voltage regulators	Voltage Regulators	TB1, Ch 7
28-30	To study IC power amplifiers	IC Power Amplifiers	TB1, Ch 8
31-33	To study the concept of Tuned amplifiers	Tuned Amplifiers	TB1 Ch9, TB2. 11.11
34-38	To understand the concepts of data conversions	D/A, A/D Converters	TB1, Ch 10, TB2Ch 9.9-9.10
39-42	To familiarize simulation software like EWB	Simulation Studies of Electronic Circuits	---

\* The lectures may be slightly diverge from aforesaid plan based on students' background & interest in the topic, which may perhaps include special lectures and discussions that would be planned and schedule notified accordingly

**Laboratory Experiments:**

S.No	Title of Experiment	No of Lab Sessions	Location
	Orientation	1	Analog Electronics Lab Room No.303
1	Frequency Response Characteristics of Common Emitter Amplifier	1	
2	Common Collector Amplifier (Emitter Follower)	1	
3	Study of Inverting and Non Inverting Op-Amp Circuits and their applications	1	
4	Study of Op-Amp based feedback amplifier	1	
5	Design of Active filters using Op-Amps	1	
	Practice Session	1	



6	Characteristics of Half-wave and Full-wave Precision Rectifier	1	Analog Electronics Lab Room No 303
7	Study of Oscillators and Simulation of Inductance using Op-Amps	1	
8	Application of IC 555 Timer Circuit in Astable and Monostable modes	1	
9	Study of Phase Locked loop using IC 565	1	
10	Performance characteristics of Voltage Regulators using IC 723	1	
	Practice Session	1	

**Evaluation scheme:**

EC No	Components	Duration	Weightage	Date & Time	Venue
1	Test- 1 (Closed Book)	50 mins	15 %	23.02.2014 Su8	To be announced later
2	Quiz-1(Closed Book)	20 - 25 mins	8 %	16.03.2014 Su8	
3	Test-2 (Open Book)*	50 mins	15%	13.04.2014 Su8	
4	Quiz-2 (Closed Book)	20 -25 mins	7%	4.05.2014 Su8	
5	Continuous assessment	-	5%+5%	-	
6	Lab Test & Viva (Closed Book)	-	15%	To be announced Later	
7	Comprehensive Exam (Closed Book)	3 hours	30%	22.05.2014 (AN)	

\* Only prescribed text book(s) and hand written notes are permitted.

**Mid-sem Grading:**

Mid-sem grading will be displayed after two evaluation components in theory and five experiments in lab are completed.

**Note:** A student will be likely to get "NC", if he / she

- Doesn't appear / appear for the sake of appearing for the evaluation components / scoring zero in pre-compre total.
- Scoring zero in the lab component / Abstaining from lab classes throughout.

**Makeup and Attendance policies:**

**Make-ups** are not given as a routine. It is solely dependent upon the genuineness of the circumstances under which a student fails to appear in a scheduled evaluation component. In such circumstances, prior permission should be obtained from the Instructor-in-Charge (I/C). The decision of the I/C in the above matter will be final.

**Attendance:** Every student is expected to be responsible for regularity of his/her attendance in class rooms and laboratories, to appear in scheduled tests and examinations and fulfill all other tasks assigned to him/her in every course. A student should have a minimum of 50% of attendance in a course to be eligible to appear for the Comprehensive Examination in that course. For the students under the purview of Academic Counseling Board (ACB), the Board shall prescribe the minimum attendance requirement on a case-to-case basis. Attendance in the course will be a deciding factor in judging the seriousness of a student which may be directly / indirectly related to grading.

**General timings for consultation:** To be announced Later

**General instructions:** Students should come prepared for classes and carry the text book(s) or material(s) as prescribed by the Course Faculty to the class.

**Notices:** All notices concerning the course will be displayed on the respective Notice Boards.

*V. Kalaichelvi*  
Dr.V.Kalaichelvi  
Instructor – In- Charge

**Contact Details:**

Dr.V.Kalaichelvi, Asst. Professor/EIE, Chamber No: 284 , Contact No: +9714 4200700 Ext 349,  
Email: kalaichelvi@dubai.bits-pilani.ac.in  
Dr.S.Swaminathan, Professor/EIE, Chamber No: 289, Contact No: +9714 4200700 Ext .353 ,  
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Dr.Abdul Rajak, Asst Professor/EEE chamber No. 282 Contact No: +9714 4200700 Ext.346  
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Dr.R.Gomathi Bhavani, Asst. Professor/EEE, chamber No.313A2 , Contact No: +9714 4200700 Ext.419  
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# BITS PILANI, DUBAI CAMPUS

## INSTRUCTION DIVISION

Second Semester 2013 – 2014

### Course Handout (Part – II)

Date: 02.02.2014

In addition to Part I (General Handout for all courses appended to the Time Table) this portion further specific details regarding the course.

Course No. : ECE C394 (3 0 3) / ECE F343 (3 1 4) COM COD: 241 / 1595  
Course Title : Communication Networks  
Course Instructors : Dr. G. Vijaya  
Instructor-in-charge : Dr. G. Vijaya

**Scope and Objective of the Course:** The course provides an introduction to fundamental network architecture concepts and their application in existing and emerging networks. While offering a broad coverage evolution and fundamental of communication network concepts, the course emphasizes the pivotal role of Internet protocols in future network architecture. In this one-semester course while introducing all the important elements of communication network fundamentals and offering a balanced exposure to network design architectures, the challenge is to prepare students for a future of constant changes in this broad area.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:** Given in the BITS Bulletin 2013 – 14 CD

#### Text book(s) [TB]

- T1. Dimitri Bertsekas and Robert Gallager: Data Networks; PHI, 2<sup>nd</sup> Edition, 1992.  
T2. Alberto Leon-Garcia and Indra Widjaja: Communication Networks – Fundamental Concepts and Key architectures, 2<sup>nd</sup> Edition, Tata McGraw Hill, 2004.

#### Reference book(s) [RB]:

- R1. W. Stallings: Data and Computer Communication; Prentice-Hall, 1997.  
R2. J.T. Geier, J. Geir, Wireless LANs, Macmillan, 2001.

#### Course Plan / Schedule:

S. No	Topics to be covered	Learning objectives	Ref. to Text Book Text Book (Chap.Section)	No. of lectures
1	Introduction to the course	Introduction	T1( 1.1, 1.2); T2 (1)	1
2	OSI: Reference Model; seven layers, their functionality, and examples.	Draw and explain the OSI model of network architecture.	T1( 1.3); T2(2.2, 2.3); Class Notes	3
3	Circuit switching: Space-division switching, time-division switching, Blocking/nonblocking switching, TST switching; Packet Network Technology: Datagrams, Virtual Circuits, Connectionless switching, Store-and-forward.	Explain and compare packet and circuit switching.	T1(1.2.1,1.2.3); T2(4.4,7.3)	5
4	Error detection and correction: Parity Checks, CRC; ARQ retransmission strategies.	Design simple systems to perform error correction and detection, retransmission.	T1 (2.3,2.4,3.2,3.3,3.4.1); T2 (3.9,5.2, A.1.2,A.3, A.5); Class Notes	6
5	Little's Theorem, M/M/1 and M/M/m queues, ARQ system delay analysis	Apply queuing models to communication networks.		4
6	TDMA, FDMA, CDMA.	Explain and analyze multi-access communication protocols.	T1: (2.2.6); Class Notes; T2: (4, 6.4.1, 6.4.2, 6.4.3);	5
7	ALOHA, CSMA, IEEE-802.3, token ring (IEEE 802.5), FDDI, token bus (IEEE 802.4, 802.6) Wireless LAN (IEEE 802.11)	Explain and analyze IEEE 802-based LAN protocols.	T1(4.2, 4.4.1, 4.5.3, 4.5.4); T2(6.2.1 to 6.2.3, 6.7,6.8.1, 6.9.6.10); Class Notes	5
8	Bellman-Ford algorithm, Dijkstra's algorithm, Floyd-Warshall algorithm, Window Flow Control, ARPANET.	Design simple routing and flow control algorithms.	T1(5.2.3, 6.2.); T2(7.5.1, 7.5.2); Class Notes	5
9	TCP/IP: IP, UDP, TCP; ATM: ATM Layer, AAL1, ATM addressing; ISDN.	Explain and analyze TCP/IP, ISDN, and ATM protocols.	T1( 2.9, 2.10); T2 (4.5.2, 4.6.2, 8.1,8.2,8.4,8.5, 9.3, 9.4.1, 9.5.1); Class Notes	5
10	Engineering Design of LAN: LLC, Ethernet, Token Ring, FDDI, Wireless LANs, VLAN, FHSS, DSSS, Infrared, Bluetooth, 3G.	Design a simple LAN.	T2 (6.10, 6.11, Support to design); Class Notes	3
11	Adhoc networks: Basic Concepts, Advantages, Limitations; Wireless LAN	Discuss adhoc networks and security issues in context of	T2: 6.10.1 Class Notes	3



security: Authentication, encryption/decryption – WEP, some attacks.	Wireless LAN.		
Total number of Lecture Classes planned: 45			

#### Evaluation scheme:

EC No	Evaluation Components	Nature of Component	Duration	Weightage	Date(hr.) <sup>©</sup>	Venue
1	Test-I	Closed Book	50 minutes	20%	26.2.14 (W6)	To be announced later (TBA)
2	Quiz-1	Closed book	20 minutes	7%	19.3.14; (W6)	
3	Test - 2	Open book*	50 minutes	20%	23.4.14 (W6);	
4	Quiz – 2	Closed book	20 minutes	8%	14.05.14 (W6);	
5	Assignments	TBA	Continuous	10%	TBA	
6	Compre Exam	Closed Book	3 hours	35%	27.5.14 (T-AN)	

\* Only prescribed Text Book(s) and/or hand-written "class-notes" permitted; <sup>©</sup>May get rescheduled subject to contingencies, if any.

**Assignments:** Assignments could also be in the form of further reading/seminars/presentations/viva/practical/case-or field-studies (which could include interpretation/ analysis of data); Assignments will be announced either in the class or through a separate notification along with the form & deadlines of submission. Assignment submissions made beyond the submission deadlines will not be accepted. It is necessary that all students stick to time schedules. No make-ups would granted for assignments (and Quizzes).

#### Mid-sem Grading:

Mid-sem. grading will be displayed after two evaluation components or earlier when- ever about 40% of evaluation components are completed.

**Note:** A student will be likely to get "NC", if he / she

- doesn't appear / appear for the sake of appearing in an evaluation component / scoring zero in pre-compre total.
- Score zero in the lab component, if any / Abstaining throughout from the lab classes, if any.

#### Makeup and Attendance policies:

**Make-ups** are not given as a routine. It is solely dependent upon the genuineness of the circumstances under which a student fails to appear in a scheduled evaluation component. In such circumstances, prior permission should be obtained from the Instructor-in-Charge (I/C). The decision of the I/C in the above matter will be final. No makeups will be granted either for Quizzes / Assignments.

**Attendance:** Every student is expected to be responsible for regularity of his/her attendance in class rooms and laboratories, to appear in scheduled tests and examinations and fulfill all other tasks assigned to him/her in every course. A student should have a minimum of 50% of attendance in a course to be eligible to appear for the Comprehensive Examination in that course. For the students under the purview of Academic Counseling Board (ACB), the Board shall prescribe the minimum attendance requirement on a case-to-case basis. Attendance in the course will be a deciding factor in judging the seriousness of a student which may be directly / indirectly related to grading.

**General Instructions:** Students should come prepared for classes and carry to the class the text book(s) or material(s) as prescribed by the Instructor(s), from time to time. Please also refer to the Course Handout Part-I provided along with the Time Table.

**Timings for chamber consultation:** Student(s) is(are) welcome to consult either at a day & time convenient mutually to both the student(s) & the Instructor or during the scheduled chamber consultation hour, indicated below:

Instructor	Chamber No.	Day and Hour
Dr. G. Vijaya	G-12	Thursday, 8 <sup>th</sup> hour.

**Notices:** All notices will be displayed on the III year Notice Board.

Instructor-in-Charge  
Dr. G. Vijaya

#### Instructors' Contact Details:

Dr. G. Vijaya, Professor, Electronics & Instrumentation & Dean (Research & Consultancy);  
Faculty Chamber No.: G-12; Phone No.: +971- 4200 700 (Ext.113); Mobile No.: +971-50-3757081;  
Email: dr\_gv@dubai.bits-pilani.ac.in



**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**SECOND SEMESTER 2013 - 2014**

**Course Handout (Part II)**

Date: 02.02.2014

In addition to part-I (General Handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

**Course No** : EA C443 / EEE F435 (3 0 3)  
**Course Title** : IMAGE PROCESSING / DIGITAL IMAGE PROCESSING  
**Instructor-in-charge** : DR. JAGADISH NAYAK  
**Instructors** : DR. JAGADISH NAYAK

**Scope and objective of the course:**

The course introduces the students to the fundamentals of digital images and various processing techniques that are applied to them so as to improve their quality. These techniques are image enhancement, image restoration and image compression. It also briefly introduces automatic image classification and recognition.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:** Given in the Catalogue 2013 – 2014 CD

**Study Material:**

**Text Books:**

Gonzalez, R. C. & R. E. Woods, Digital Image Processing, Pearson Education , 3rd edition. 2008.

**Reference books:**

Anil K Jain, Fundamentals of Digital Image Processing, Prentice –Hall Inc, 1989, Reprint 2004

**Course plan:**

Lec. No.	Learning objectives	Contents	References@ (Chapters)
1-3	To introduce fundamental concepts and terms associated with digital images.	2D signals and systems. A simple image formation model; image sampling, quantization and interpolation	2.3.4 -2.4.4
4	To introduce the concept of image enhancement	Spatial Domain enhancement techniques	3.1
5-6	To study image enhancement by gray level transformations	Some basic gray level transformations: image negatives; log, power-law and piecewise linear	3.2.1-3.2.4
7-8	To study Histogram processing of an image	Histogram processing: equalization matching, local enhancement	3.3-3.3.3
9-10	To study Histogram processing of an image	Histogram statistics; arithmetic/logic operations	3.3.4
11-12	To learn image enhancement by filtering in the spatial domain	Spatial filtering: smoothing and sharpening	3.4-3.6.4
13-15	Image Transforms	DFT, DCT,	4.2-4.3
16-17	Image Transforms	Walsh-Hadamard Transform	4.4-4.5
18-19	Image Transforms	K-L Transform, Discrete Hadamard Transform	4.6
20-22	To learn image enhancement by filtering in the frequency domain	Filtering in the frequency domain	4.7
23-24	Frequency domain filtering	Smoothing, sharpening and selective filtering	4.8-4.10
25	Frequency domain filtering	Filter banks and wavelets	4.11
26-27	Image degradation	Image degradation model,	5.1-5.2



27-28	Degradation	Estimating the degradation	5.6
29	To learn inverse filtering	Inverse filtering	5.7
30-31	To introduce the fundamentals of image compression	Fundamentals of image compression	8.1
32-34	Basic Compression methods	Huffman, arithmetic and LZW coding.	8.2.1-8.2.4
35-36	Basic Compression methods	Run-Length, symbol based, Bit plane and predictive coding JPEG	8.2.5-8.2.9
37-38	A brief introduction to segmentation techniques	Image segmentation	10
39-40	To study Image reconstruction from the projections	Image reconstruction from projections, Principle of computer tomography (CT), Projection and Radon Transform, The Fourier slice theorem, Reconstruction Using Parallel-Beam Filtered Backprojections..	5.11
41-42	To understand automatic image recognition	Object recognition, Pattern and Pattern classes, Image recognition based on Decision-Theoretic Methods.	12.1-12.2
43	To learn where the image processing techniques are applied	Image Processing Applications such as Character recognition, Bio-medical application, Remote sensing.	On-line materials

\* The lectures may be slightly diverge from aforesaid plan based on students' background & interest in the topic, which may perhaps include special lectures and discussions that would be planned and schedule notified accordingly.

#### Evaluation Scheme:

EC No	Components	Duration	Weightage%	Date & Time	Venue
1	Quiz 1	20 Mins	7	16.3.14 Su2	To be announced in the respective notice boards
2	Test 1 (Closed Book)	50 Mins	25	23.2.14 Su2	
3	Assignment (Matlab)	Continuous	8	[TBA]	
4	Test 2 (Open Book)	50 Mins	20	13.4.14 Su2	
5	Comprehensive (Closed Book)	3 Hours	40	1.6.14 AN	

\* Only prescribed text book(s) and hand written notes are permitted.

\* **Assignment / Practical / Field / Case Studies:** The Assignment / Practical will be given / conducted on either some or all of the above mentioned topics. Case studies, interpretation of data and then analysis, will form a part of all evaluation components. Assignments(s) may include seminar presentation and viva. Details will be intimated through a separate notification or announced in the class and the deadlines would be indicated therein. However all assignments/reports would be completed by 2<sup>nd</sup> week of May, 2014. It is necessary that all students stick to time schedule and do not postpone submission of assignments/reports. This will prevent extra load during last two weeks of class work. No make-ups would be allowed for submission of assignments / practical reports.

**Reading Assignments:** Students are advised to read, collect additional information on the above mentioned topics as per given schedule. In addition, awareness w.r.t. latest developments in the area would be an added advantage

\* The field indicated in blue is applicable only for those who conduct the evaluation components mentioned therein.

#### Mid-sem Grading:

Mid-sem grading will be displayed after two evaluation components or earlier when- ever about 40 % of evaluation components are completed.

**Note:** A student will be likely to get "NC", if he / she

- Doesn't appear / appear for the sake of appearing for the evaluation components / scoring zero in pre-compre total.
- Scoring zero in the lab component / Abstaining from lab classes throughout.



**Makeup and Attendance policies:**

**Make-ups** are not given as a routine. It is solely dependent upon the genuineness of the circumstances under which a student fails to appear in a scheduled evaluation component. In such circumstances, prior permission should be obtained from the Instructor-in-Charge (I/C). The decision of the I/C in the above matter will be final.

**Attendance:** Every student is expected to be responsible for regularity of his/her attendance in class rooms and laboratories, to appear in scheduled tests and examinations and fulfill all other tasks assigned to him/her in every course. A student should have a minimum of 50% of attendance in a course to be eligible to appear for the Comprehensive Examination in that course. For the students under the purview of Academic Counseling Board (ACB), the Board shall prescribe the minimum attendance requirement on a case-to-case basis. Attendance in the course will be a deciding factor in judging the seriousness of a student which may be directly / indirectly related to grading.

**General timings for consultation:**

Each instructor will specify his / her chamber consultation hours during which the student can contact him / her in his / her chamber for consultation. (For details see part II)

**General instructions:**

Students should come prepared for classes and carry the text book(s) or material(s) as prescribed by the Course Faculty to the class.

**Notices:**

All notices concerning the course will be displayed on the respective Notice Boards.

  
Instructor-in-Charge  
Dr. Jagadish Nayak

**Contact details**

Dr. Jagadish Nayak Assistant Professor

Contact details: Chamber No:330 (Inside Communication Systems Lab, 3<sup>rd</sup> Floor B wing)

Contact No: +9714 4200700 Ext. 436

email: jagadishnayak@dubai.bits-pilani.ac.in

Mobile No: 055 4907979



**BITS, PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**II SEMESTER 2013-2014**

**Course Handout (Part II)**

Date: 02.02.2014

*In addition to Part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.*

**Course No.** : BITS F415 (3 1 4) EA C415 4\*  
**Course Title** : INTRODUCTION TO MEMS  
**Instructor-in-Charge** : Anand Kumar  
**Instructor** : Anand Kumar

**Scope and objective of the Course:**

The course introduces the basic concepts in Micro Electromechanical Systems (MEMS). The discussion on topics like MEMS design, Microfabrication, Microfluidics, Microrobotics and Microsensors have been structured in the course plan. The objective of the course is to equip the students from various aspects and with basic knowledge of the area of MEMS.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:**

*Given in the Catalogue 2013 – 2014 CD*

**Text Book(TB) :**

1. G.K. Ananthasuresh et al, *Micro and Smart Systems*, Wiley, India, 2010.
2. Sharma, NN & Others, *Lab Manual for MEMS*, Notes EDD, 2011

**Reference Books(RB) :**

1. Tai-Ran Hsu, *MEMS and Micro Systems- Design, Manufacture and Nanoscale Engineering*, Tata McGraw Hill, 2008.
2. Nitaigour P. Mahalik, *MEMS*, Tata McGraw Hill, 2007
3. Chang Liu, *Foundation of MEMS*, Pearson Education Inc., NJ, 2006
4. IEEE/IEL online database

**Course Plan/ Schedule:**

Lec. No	Learning Objective	Contents	References@ Ch No
1-2	Overview of MEMS and Microsystems	Introduction, Historical Background, Microelectronics and Microsystems	TB: Ch 1 RB1: Ch 1
3-5	Basic Concepts of MEMS Design and Fabrication	Molecular theory of matter and intermolecular forces, Doping of semiconductors, Diffusion and Ion implantation, Plasma Physics, Electrochemistry, Quantum Physics	RB1: Ch 3
6-8	Scaling Laws	Introduction to scaling, Scaling in geometry, rigid-body dynamics, electrostatic and electromagnetic forces. Other scaling properties.	TB: Ch 9 RB1: Ch 6
9-14	Microsensors & Microactuators	MEMS based Acoustic wave, Biomedical, Chemical, Optical microsensors. Pressure sensors, Thermal sensors. Microactuation based on thermal, piezoelectric, electrostatic properties. MEMS with microactuators. Engineering mechanics for Microsystems design	TB: Ch 2 RB1: Ch 2, 4
15-17	Materials for MEMS and Microsystems	Silicon, Silicon compounds, Silicon Piezoresistors, Gallium Arsenide, Quartz, Piezoelectric crystals, Polymers	RB1: Ch 7
18-23	Microfabrication Processes	Basic microfabrication processes: Photolithography, Ion implantation, Diffusion, Oxidation, PVD, CVD, Epitaxy, Etching	TB: Ch 3 RB1: Ch 8 RB2: Ch 2



24-27	Micromanufacturing	Bulk micromanufacturing, surface micromachining, LIGA process,	RB1: Ch 9
28-33	Modeling in MEMS	Mechanics of Slender Solids, FEM, Modeling of coupled Electromechanical Systems; Modeling Fluid Systems and Thermal Systems; Modeling Translational/Rotational/Hybrid Systems	TB: Ch 4, 5, 6 RB2: Ch 3 Class Notes
34-36	RF MEMS	RF MEMS Switches, Micro Relays, MEMS Inductors and Capacitors, Micromachined RF Filters	RB2: Ch 9 Class Notes
37-39	Microfluidics	Thermo fluid engineering, Fluid flow in micro and nano scale, heat conduction in micro scale solids	RB1: Ch 5 RB2: Ch 10
40-42	Microsystem design	Design considerations, Process design, Mechanical design, CAD solutions, Examples	RB1: Ch10
43-44	MEMS Packaging	Microsystems packaging, Packaging considerations	RB1: Ch11
45	Microrobotics	Introduction to Microrobotics	Class Notes

#### Evaluation Schedule:

EC NO	Evaluation Components	Nature of Component	Duration	Weightage %	Date & Time	Venue
1	Test-1	Closed Book	50 mins	20	5.3.2014 (W8)	TBD
2	Quiz/Lab/Assignments	Closed Book/Open Book	-	20	26.3.2014 (W8)/Continuous	
3	Test - 2	Open book*	50 mins	20	23.4.2014 (W8)	
4	Compre Exam	Closed Book	3 hours	40	29.5.2014 (AN)	

\* For open book test, only the text book and **handwritten class** notes will be allowed.

#### General Instructions, Attendance & Make-up Policies, etc:

Please refer to the Time Table

#### Timings for chamber consultation:

Wed 7<sup>th</sup> period

#### Notices:

All notices will be displayed on the III/IV Year Notice Board.



Instructor – In- Charge

#### Instructor's Contact details

Anand Kumar, Room No. 126, Contact No: 04 4200700 Ext: 217,  
Mobile No: 050 722 5749 E-mail: [akumar@dubai.bits-pilani.ac.in](mailto:akumar@dubai.bits-pilani.ac.in).



**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**SECOND SEMESTER 2013 - 2014**

Course Handout (Part II)

Date: 03.02.2014

In addition to part-I (General Handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

**Course No** : MATH C231/MATH F231 (3 0 3)  
**Course Title** : Number Theory  
**Instructor-in-charge** : Dr. Priti Bajpai  
**Instructors** : Dr. Priti Bajpai

**Scope and objective of the course:**

The objective of the course is to give an insight into the fundamental theorems of arithmetic, Solving Diophantine equations, Theory of congruence's for Divisibility problems, Importance of prime numbers, Arithmetic Functions, Quadratic Residues, Continued fractions and modern applications of Number Theory.

**Course Pre/Co- requisite (if any) & Catalogue / Bulletin Description:** Given in the Catalogue 2012 – 2013 CD

**Study Material:**

**Text Books:** Koshy Thomas: Elementary Number Theory with Applications, Elsevier, 2<sup>nd</sup> edition, 2008.

**Reference books:**

1. George E. Andrews, Scott Andrews, Number Theory, Dover Publications , 1994.
2. Hardy, Wright, An Introduction to the Theory of Numbers, Oxford University, 6<sup>th</sup> edition, 2008.

**Course plan:**

Lec. No.	Learning objectives	Contents	References@ (Chapters)
1-8	To Learn what are divisibility problems and to study various classes of integers	Divisibility, Prime Numbers, Fibonacci numbers Lucas Numbers ,Fermat Numbers	2
9-18	To learn fundamental operations on integers, which lead to the fundamental theorem of Arithmetic. To learn what are Diophantine equations and to solve them	Greatest Common Divisor, Least Common Multiple, Euclidian Algorithm, Fundamental theorem of Arithmetic. Diophantine equations and their Solution	3
19-21	To know the basics to develop theory of congruence's. To learn how to solve congruence's	Fundamentals of Congruence's, Solving Congruence's	4
22-23	To be introduced to solution of system of congruence's and method to solve them	Chinese Remainder Theorem	6
24-27	Mile stone theorems in Number Theory	Wilson's Theorem, Fermat's Little Theorem, Euler's Theorem	7
28-31	To learn about important functions related to multiplication and division	Arithmetic Functions: Euler's Phi function, The Tau and Sigma function, The Mobius function	8
32-35	To discuss order of integers and primitive roots	The order of a positive integer, Primality tests, primitive roots for primes	10
36-40	To learn about	Quadratic Residues, The Legendre symbol,	11



	quadratic congruence's and quadratic reciprocity law	Quadratic reciprocity, The Jacobi symbol	
41-44	Continued fractions	Continued fractions.	Class Notes

\* The lectures may be slightly diverge from aforesaid plan based on students 'background & interest in the topic, which may perhaps include special lectures and discussions that would be planned and schedule notified accordingly.

**Evaluation Scheme:**

EC No	Components	Duration	Weightage%	Date & Time	Venue
1	Test-1	50 minutes	25	13.03.14 (Th9)	To be announced later
2	Quiz-1	20 minutes	08	10.04.14(Th9)	
3	Test - 2	50 minutes	20	04.05.14 (Su9)	
4	Quiz - 2	20 minutes	07	To be announced	
5	Compre Exam	3 hours.	40	05.06.14 (AN)	

\* Only prescribed text book(s) and hand written notes are permitted.

**Mid-sem Grading:**

Mid-sem grading will be displayed after two evaluation components or earlier when- ever about 40 % of evaluation components are completed.

**Note:** A student will be likely to get "NC", if he / she

- Doesn't appear / appear for the sake of appearing for the evaluation components / scoring zero in pre-compre total.

**Makeup and Attendance policies:**

**Make-ups** are not given as a routine. It is solely dependent upon the genuineness of the circumstances under which a student fails to appear in a scheduled evaluation component. In such circumstances, prior permission should be obtained from the Instructor-in-Charge (I/C). The decision of the I/C in the above matter will be final.

**Attendance:** Every student is expected to be responsible for regularity of his/her attendance in class rooms and laboratories, to appear in scheduled tests and examinations and fulfill all other tasks assigned to him/her in every course. A student should have a minimum of 50% of attendance in a course to be eligible to appear for the Comprehensive Examination in that course. For the students under the purview of Academic Counseling Board (ACB), the Board shall prescribe the minimum attendance requirement on a case-to-case basis. Attendance in the course will be a deciding factor in judging the seriousness of a student which may be directly / indirectly related to grading.

**General timings for consultation:**

Each instructor will specify his / her chamber consultation hours during which the student can contact him / her in his / her chamber for consultation. (For details see part II)

**General instructions:**

Students should come prepared for classes and carry the text book(s) or material(s) as prescribed by the Course Faculty to the class.

**Notices:**

All notices concerning the course will be displayed on the respective Notice Boards.

Dr. Priti Bajpai  
Instructor-in-Charge

**Contact details**

Name : Dr. Priti Bajpai , Designation :Professor,  
Contact details: Chamber No:G014 , Contact No: +9714 4200700 Ext 115. email: priti@bits-dubai.ac.ae  
Mobile No: 0558613352



**BITS Pilani, Dubai Campus**  
**Course Handout**  
**Fourth Year (2014-15)**



**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**FIRST SEMESTER 2014 – 2015**

**Course Handout (Part – II)**

**Date:** 02.09.2014

*In addition to Part I (General Handout for all courses appended to the Time Table) this portion further specific details regarding the course.*

**Course No** : ECON F212 (3 0 3)  
**Course Title** : Funda of Fin and Account  
**Instructor-in-charge** : Aqila Rafiuddin  
**Instructors** : Aqila Rafiuddin

**Scope and objective of the course:**

This course is an introduction to the reporting system used by businesses to convey financial information to users external to the enterprise and the basics of financial markets and financial management. In the first part of the course, primary emphasis will be on understanding the financial reports that are the end products of the accounting system- what they tell us about a business enterprise. The second part will emphasize the financial markets; financial market reforms; primary and secondary markets; sources of investment information; portfolio selection, preliminary concepts of financial management etc.

**Course Pre/Co- requisite (if any)& Catalogue / Bulletin Description:** Given in the Bulletin 2014 – 2015

**Study Material:**

**Text Books:**

TB: Horngren, Sundem, Elliott and Philbrick, "Introduction to Financial Accounting", Pearson Education India Ltd., 9<sup>th</sup> edition.,2008.

**Reference books:**

Brigham Eugene F and Houston Joel F., Fundamentals of Financial Management, 12/e, Thomson South-Western, 2011.

**Course plan:**

<b>Lec. No.</b>	<b>Learning objectives</b>	<b>Contents</b>	<b>References @ (Chapters)</b>
	<b>I -ACCOUNTING</b>		
1-2	Understanding the meaning and difference between the two	Introduction to Accounting & Finance	Class Notes
3-4	Understanding the nature of accounting and balance sheet transactions*	Accounting: The Language of Business	1
5-7	Understanding the income statement and accounting for dividends and retained earnings*	Measuring Income to Assess Performance	2
8-10	Interpret transactions in double entry accounting	Recording Transaction	3
11-14	Understanding the concept of accruals and relevant adjustments made	Accrual Accounting and Financial Statements	4
15-17	Understand the importance of cash flow and ability to prepare cash flow statement	Statement of Cash Flows	5
18-20	Ability to recognize and measure sales revenue	Accounting for Sales	6
21-23	Ability to measure gross profit and cost of goods sold	Inventories and Cost of Goods Sold	7
24-25	Ability to evaluate trends and components of business through calculation of financial ratios	Financial Statement Analysis	12
	<b>II -FINANCE</b>		
26-29	Understanding core concepts relating to financial and securities market	Introduction to Securities, financial markets (primary & secondary) & analysis	Class notes
30-32	Understanding relationship between risk and rates of return, types of risk	Risk and rate of return	8(RB)



33-35	Understanding different types and importance of capital expenditure decisions on business sustainability	Capital Budgeting	10 (RB)
36-37	Understanding components of capital structure and analyzing factors that affect capital structure decisions	Capital Structure	14(RB)
38-39	Understanding objectives of working capital management & components of working capital	Working capital management – managing & financing current assets	15 & 16 (RB)
40-41	Understanding and relating financial sector reforms to impact on economy	Financial Sector Reforms	Class notes
42-43	Identifying sources of investment information and portfolio selection	Portfolio management	Class notes

\*The lectures may be slightly diverge from aforesaid plan based on students' background & interest in the topic, which may perhaps include special lectures and discussions that would be planned and schedule notified accordingly.

#### **Evaluation Scheme:**

EC No	Evaluation Components	Duration	Weightage	Date & Time	Venue
1	Test-I (Closed book)	50 minutes	25%	30.09.14 T2	To be announced
2	Quiz-1 (Closed book)	20 minutes	8 %	14.10.14 T8	
3	Test - 2 (Open Book)	50 minutes	20%	16.11.14 Su2	
4	Quiz - 2 / Assignment (Closed book)	20 minutes	7%	16.12.14 T8	
5	Compre Exam (Closed book)	3 hours.	40%	31.12.14 (AN)	

#### **Mid-Sem Grading:**

Mid-sem grading will be displayed after two evaluation components. (Refer Academic calendar for schedule).

**Note:** A student will be likely to get "NC", if he / she doesn't appear / appear for the sake of appearing for the evaluation components / scoring zero in pre-compre total.

#### **Makeup and Attendance policies:**

**Make-ups:** are not given as a routine. It is solely dependent upon the genuineness of the circumstances under which a student fails to appear in a scheduled evaluation component. In such circumstances, prior permission should be obtained from the Instructor-in-Charge (I/C). Students with less than 50% of attendance will not be allowed to avail the make-ups. The decision of the I/C in the above matter will be final.

**Attendance:** Every student is expected to be responsible for regularity of his/her attendance in class rooms and laboratories, to appear in scheduled tests and examinations and fulfill all other tasks assigned to him/her in every course. A student should have a minimum of 50% of attendance in a course to be eligible to appear for the Comprehensive Examination in that course. For the students under the purview of Academic Counseling Board (ACB), the Board shall prescribe the minimum attendance requirement on a case-to-case basis. Attendance in the course will be a deciding factor in judging the seriousness of a student which may be directly / indirectly related to grading.

#### **General timings for consultation:**

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#### **General instructions:**

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#### **Notices:**

All notices concerning the course will be displayed on the respective Notice Boards

Instructor-in-Charge  
**ECON F212**

#### **Contact details**

Ms. Aqila Rafiuddin, Lecturer, Chamber No: 216 Contact No: +9714 4200700 Ext: 308 Mobile No: 971526502700 email: [aqila@dubai.bits-pilani.ac.in](mailto:aqila@dubai.bits-pilani.ac.in)



**BITS PILANI, DUBAI CAMPUS**  
**INSTRUCTION DIVISION**  
**FIRST SEMESTER 2014 – 2015**

**Course Handout (Part – II)**

**Date:** 02.09.2014

*In addition to Part I (General Handout for all courses appended to the Time Table) this portion further specific details regarding the course.*

**Course No** : GS F232 (3 0 3)  
**Course Title** : Introductory Psychology  
**Instructor-in-charge** : Aqila Rafiuddin  
**Instructors** : Aqila Rafiuddin

**Scope and objective of the course:**

To develop a conceptual framework for individuals to think and understand the human behavior and act in specific situations and also attempts to establish a reliable explanation as why they do so. It has relevance of in daily life and its application in social, educational, industrial, personal and other spheres.

**Course Pre/Co- requisite (if any)& Catalogue / Bulletin Description:** *Given in the Bulletin 2014 – 2015*

**Study Material:**

**Text Books:**

TB: Baron, Robert A, "Psychology" Pearson Education., 5<sup>th</sup> edition.,2009.

**Reference books:**

Morgan, Clifford T and others, "Introduction to Psychology", Tata Mc Graw Hill, India., 7<sup>th</sup> edition,1993.

**Course plan:**

<b>Lec. No.</b>	<b>Learning objectives</b>	<b>Contents</b>	<b>References @ (Chapters)</b>
1-5	Psychology A science and a perspective	Modern psychology, psychology: Its grand issues and key perspectives, psychology 2000:: Trends for the New Millennium, psychology & Scientific methods. Research methods in psychology	1
6-7	Biological Basis of Behavior	The nervous system, the Brain and Human Behavior	2
8-10	Making contact with the world around us	Perception, the plasticity of perception, Extrasensory perception	3
11-13	How we are changed by experience	Learning – classical conditioning, operant conditioning, observational learning	5
13-15	Memory of things remembered & forgotten	Human Memory, kinds of information stored in memory, forgetting, Memory distortion and memory construction, Memory on Everyday life	6
16-19	Cognition: Thinking & Deciding	Reasoning, Making decisions, Problem Solving	7
20-22	Motivation	The activation and persistence of behavior, Theories of motivation, Kinds of motives, Intrinsic motivation	10
23-25	Emotion	Its nature & expression; Impact of emotion on cognition	10
26-28	Intelligence	Intelligence: Views of its nature, measuring intelligence, the role of heredity and the role of environment; group differences in intelligence test scores	11
29-32	Emotional Intelligence	Emotional Intelligence: The feeling side of intelligence; Creativity: Generating the extraordinary	11
33-36	Personality: Uniqueness and Consistency in the behavior of Individuals	The Psychoanalytic Approach; Humanistic theories	12
37-38	Stress & Coping	Stress: Its Causes, Effects & Coping, Behavior; Psychological Correlates of Illness; Promoting Wellness	13
39-40	Social Thought	Social Thought: Thinking about other people Attribution, Social Cognition, Attitudes	16
41-42	Social Behavior	Prejudice, Social Influence, Leadership	16



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Instructor-in-Charge  
**GS F232**

**Contact details**

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