



**AMITY UNIVERSITY**  
— R A J A S T H A N —

**AMITY SCHOOL OF ENGINEERING & TECHNOLOGY  
(ASET)**

**PROGRAM STRUCTURE & SYLLABUS**

**M. Tech. (Electronics & Communication Engineering)**

**Program Code: MTE**

**12153**

**Duration – 2 Years Full Time**

**2021 – 2023**

## Program Outcomes (POs)

### M.Tech. (Electronics & Communication Engineering)

PLO.1-Having an ability to apply mathematics and science in engineering applications.

PLO.2-Having an ability to design a component or a product applying all the relevant standards and with realistic constraints, including public health, safety, culture, society and environment

PLO.3-Having an ability to design and conduct experiments, as well as to analyse and interpret data, and synthesis of information

PLO.4-Having an ability to use techniques, skills, resources and modern engineering and IT tools necessary for engineering practice

PLO.5-Having problem solving ability- to assess social issues (societal, health, safety, legal and cultural) and engineering problems

PLO.6-Having adaptive thinking and adaptability in relation to environmental context and sustainable development

PLO7-Having a clear understanding of professional and ethical responsibility

PLO8-Having a good cognitive load management skills related to project management and finance

### Credit Summary

Semester	Core course (CC)	Domain Electives (DE)	Values Added Course (VAC)	Open Electives	NTCC	Total
I	19	4	4	3	2	32
II	20	4	4	3	2	33
III	19	3	4	3	---	29
IV	30	-	-	-	---	30
<b>Total</b>	<b>88</b>	<b>11</b>	<b>12</b>	<b>9</b>	<b>4</b>	<b>124</b>



<b>Semester III</b>						
<b>Code</b>	<b>Course</b>	<b>Category</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
MTE 301	Digital Signal Processing	CC	3	1		4
MTE 302	Antenna Theory & Design	CC	3	1		4
MTE 303	Image Processing	CC	3	1		4
MTE 361	Project - III	CC				5
MTE 321	DSP Lab	CC			2	1
MTE 322	Image Processing Lab	CC			2	1
<b>DE Electives: Student has to select 1 course from the list of following DE electives</b>						
MTE 304	Optimization Techniques	DE	2	1		3
MTE 305	VLSI Sub System Design	DE	2	1		3
<b>Open Elective</b>						
	OPEN ELECTIVE – III	OE	3			3
<b>Value Added</b>						
MTS 341	Communication Skills – III	VA	1			1
MTS 343	Behavioural Science – III	VA	1			1
	Foreign Language – III					
FLT 344	French	VA	2			2
FLG 345	German					
FLS 346	Spanish					
FLC 348	Chinese					
<b>Total</b>						<b>29</b>

<b>Semester IV</b>						
<b>Code</b>	<b>Course</b>	<b>Category</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
MTE 450	Dissertation	CC				<b>30</b>
<b>Total</b>						

Note:- CC - Core Course, VA - Value Added Course, OE - Open Elective, DE - Domain Elective, FW - Field Work

**Total Credit- 124**

## Advanced Digital Communication

Course Code MTE 101

Credit Units 04

### Course Objectives:

To introduce the concept of digital base-band data transmission through a band limited channel. To familiarize the student with concept of binary and M-ary band-pass modulation schemes. To introduce the advanced channel coding techniques to minimize the probability of error and to acquaint with the emerging trends in digital communication field.

#### Module:1

##### Introduction to Detection and Estimation Theory

Detection of known signals in noise, Correlation receiver, Matched filter receiver, Detection of signals with unknown phase in noise. Minimum mean square error estimator, Maximum a posteriori estimator, Maximum likelihood estimation, Cramer Rao bound (CRB) for parameter estimation.

#### Module:2

##### Baseband Transmission Techniques

Digital transmission through band limited channels, Power spectrum of digitally modulated signals, Signal design for band limited channels, Band limited signal design for zero ISI, Band limited signal design for controlled ISI.

#### Module:3

##### Baseband Reception Techniques

Probability of error in detection of digital PAM, Eye pattern, Channel equalization, Linear Equalizers, Adaptive equalizers, Decision feedback equalizers, Fractionally spaced equalizers.

#### Module:4

##### Binary Bandpass Modulation Schemes

Binary modulation schemes, Coherent and non-coherent detection of binary modulation schemes, Performance analysis of binary modulation schemes under AWGN channel, Minimum Shift Keying (MSK), Gaussian Minimum Shift Keying (GMSK).

#### Module:5

##### M-ary Bandpass Modulation Schemes

M-ary Phase Shift Keying, M-ary Quadrature Amplitude Modulation, M-ary Frequency Shift Keying, Performance analysis of M-ary modulation schemes under AWGN channel, Non-coherent detection of M-ary orthogonal signals, Carrier and timing recovery, Synchronization, Applications

#### Module:6

##### Trellis and Turbo Code

Convolutional codes, Viterbi Decoder for convolutional codes, Set partitioning, Trellis codes, Turbo encoders, Turbo decoders, MAP decoder and Max-Log-Map decoder, Irregular and Asymmetric turbo codes.

#### Module:7

##### LDPC Codes

Regular LDPC codes, Gallager construction of LDPC codes, Gallager based decoding algorithm for LDPC codes and its analysis, LDPC threshold, Irregular LDPC codes.

#### Module:8

## Contemporary issues

### Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance.

### Text & References:

Text:

- Simon S. Haykin, Michael Moher, Communication Systems, 2012, 5th Edition, Wiley, India.
- Shu Lin, Daniel J. Costello, Error Control Coding, 2011, 2nd Edition, Pearson Education, UK. V. Raja Raman, "Computer Programming in C", Prentice Hall of India, 1995.

References:

Marvin K. Simon, Sami M. Hinedi, William C. Lindsey, Digital Communication Techniques: Signal Design and Detection, 2015, 1st Edition, Pearson Education, India

Richard J. Tervo, Practical Signals Theory with MATLAB Applications, 2013, 1st Edition, Wiley, India.

<http://nptel.ac.in/courses/117101051/>

# ADVANCED INSTRUMENTATION AND SYSTEM DESIGN

**Course Code MTE 102**

**Credit Units 04**

Course Objective:

The basic objective of this course is to provide the students the core knowledge of industrial instrumentation so that they learn how to implement instrumentation techniques in industry.

Course Contents:

## **Module I**

General concepts and terminology of measurement systems, static and dynamic characteristics, errors, standards and calibration.

Introduction, principle, construction and design of various active and passive transducers.

Role of transducers in Instrumentation - Transducer construction, classification and characteristics, selection of Transducers, analogue and digital transducers, Principle of operation, static and dynamic characteristics of transducer system.

## **Module II**

Transducers for Measurement of length & thickness,

linear Displacement, Angular Displacement,

force, weight, torque, Moisture,

Level, Flow,

pH & Thermal Conductivity,

Measurement of Frequency,

Proportional, Geiger Muller & Scintillation Counters.

## **Module III**

Transducers for Biomedical Application: Resistive transducers - Muscle force and Stress (Strain gauge), humidity,

Respiration Inductive Transducers - Flow measurements, muscle movement (LVDT),

Capacitive Transducers - Heart sound measurement, Pulse pick up,

Photoelectric Transducers - Pulse transducers, Blood pressure, oxygen Analyses,

Piezoelectric Transducers - Pulse pickup, ultrasonic blood flow meter,

Chemical Transducer - Ag-AgCl (Electrodes, PH electrode).

## **Module IV**

Introduction to data acquisition on PC, Sampling fundamentals, Input/Output techniques and buses. ADC, DAC, Digital I/O, counters and timers, DMA, Software and hardware installation, Calibration, Resolution, Data acquisition interface requirements.

## **Module V**

Virtual Instrumentation: Historical perspectives, advantages, block diagram and architecture of a virtual instrument, data-flow techniques, graphical programming in data flow, and comparison

with conventional programming. Development of Virtual Instrument using GUI, Real-time systems, Acquisition Systems (SCADA) software.

Introduction to Lab VIEW: Software environment, front panel, block diagram, palettes, loops, structures and tunnels, arrays, clusters, plotting data.

**Examination Scheme:**

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

**Text & References:**

- W.D. Cooper & A.D. Helfrick, Electronic Instrumentation and Measurement Techniques, PHI.
- Doebelin E.O, Measurement Systems - Application and Design, Fourth edition, McGraw-Hill International Edition.
- B.C. Nakra and K.K. Chaudhary, Instrumentation Measurement Analysis, Tata McGraw-Hill.
- Instrument Transducers by Hermann, K.P. Neubert.
- Electrical Transducers for Industrial Measurement by pH Mansfield.
- Instrumentation systems by Mani Sharma, Rangan.
- J.G. Webster Medical instrumentation Application and Design, Houghton Mifilin Co.
- Jerome, PHI Virtual Instrumentation using Lab VIEW, Jovitha, ISBN 978-81-203-40305.
- Gary Johnson - Labview Graphical Programming, Second edition, McGraw Hill.

**Examination Scheme:**

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance.

**Text & References:**

Text:

- Simon S. Haykin, Michael Moher, Communication Systems, 2012, 5th Edition, Wiley, India.
- Shu Lin, Daniel J. Costello, Error Control Coding, 2011, 2nd Edition, Pearson Education, UK. V. Raja Raman, "Computer Programming in C", Prentice Hall of India, 1995.

References:

Marvin K. Simon, Sami M. Hinedi, William C. Lindsey, Digital Communication Techniques: Signal Design and Detection, 2015, 1st Edition, Pearson Education, India

Richard J. Tervo, Practical Signals Theory with MATLAB Applications, 2013, 1st Edition, Wiley, India.

<http://nptel.ac.in/courses/117101051/>



**Course Objectives:**

The course is a another course in probability, covering techniques and theorems seen from the perspective of random walks, Markov Chains, and other discrete stochastic processes.

**Module:1**

Algebra and calculus of stochastic variables: Definition of stochastic variables, averages, addition and transformation of stochastic variables, the Gaussian distribution, the central limit theorem. Definition of stochastic processes, Fourier analysis of stationary stochastic processes, distribution functions describing a stochastic process, illustrative examples.

**Module:2**

Markov processes: The Markov property, Chapman-Kolmogorov equation, stationary Markov processes. Radioactive decay as a Markov process.

**Module:3**

The Master equation: Derivation, long time limit of the Master equation, increase of entropy of the distribution, proof of detailed balance, passage to the macroscopic equation. The Master equation for one-step processes, definition, Poisson processes, general properties, linear one-step processes, boundary conditions, the general solution of the linear one-step process. First passage problems. Monte Carlo simulations of the Master equation. The Gillespie algorithm for chemical kinetics.

**Module:4**

he Fokker-Planck and Langevin descriptions: Derivation, multivariate linear Fokker-Planck equations, Langevin description. Applications to Brownian motion, barrier crossing. The problem with nonlinearity, the Ito/Stratonovich picture in non-linear Langevin equations.

**Module:5**

Hydrodynamic and continuous descriptions: Statement of the problem, general formulation using van Kampen's Omega expansion, emergence of the macroscopic law with linear noise, application to the SIR model in epidemiology. Generalised hydrodynamics, the fluctuation-dissipation relationa for continuous systems, the Landau-Lifshitz equations of fluctuating hydrodynamics, fluctuations in the Boltzmann equation.

**Examination Scheme:**

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance.

**Text & References:**

Text:

1. Stochastic Processes in Physics and Chemistry by N. G. Van Kampen
2. 2. The Fokker-Planck Equation by H. Risken

References:

1. Handbook of Stochastic Methods by C. W. Gardiner
2. Probability Theory: The Logic of Science by E. T. Jaynes
3. Information Theory, Inference and Learning Algorithms by D. MacKay

## Stochastic Lab

Course Code MTE 123

Credit Units 01

### List of Experiments:

1. Study of types of signals Deterministic and Stochastic (Continuous)
2. Study of time properties of signals
3. Study of frequency properties of signal
4. Study of stochastic properties of signal
5. Study of Discrete Signals through MATLAB
6. Basic Properties of Linear systems
7. Study of Impulse response of Linear system
8. Analysis of MIMO SYSTEM (2-ports)
9. Study of Realization Theorem and Filters.
10. Simulation of systems using Op-amps/Software tools (MATLAB)

### Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance.

### Text & References:

Text:

3. Stochastic Processes in Physics and Chemistry by N. G. Van Kampen
4. 2. The Fokker-Planck Equation by H. Risken

References:

4. Handbook of Stochastic Methods by C. W. Gardiner
5. Probability Theory: The Logic of Science by E. T. Jaynes
6. Information Theory, Inference and Learning Algorithms by D. MacKay

## Advanced Digital Communication Lab

Course Code MTE 121

Credit Units 01

### List of Experiments:

1. Time Division Multiplexing and Demultiplexing of two band limited signals
2. Amplitude Shift Keying Modulation and Demodulation
3. Frequency shift keying Modulation and Demodulation
4. Phase Shift Keying Modulation and Demodulation
5. Differential Phase Shift Keying Modulation and Demodulation
6. Quadrature Phase Shift Keying
7. Modulation and Demodulation Measurement of frequency and power in a microwave test bench using Klystrone
8. Study of Propagation loss, Bending loss and Measurement of Numerical Aperture in OFC
9. Determination of coupling and isolation characteristics of a microstrip directional coupler (a)
10. Measurement of resonance characteristics of a microstrip ring resonator and determination of dielectric constant of the substrate.

### Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance.

### Text & References:

Text:

- Simon S. Haykin, Michael Moher, Communication Systems, 2012, 5th Edition, Wiley, India.
- Shu Lin, Daniel J. Costello, Error Control Coding, 2011, 2nd Edition, Pearson Education, UK. V. Raja Raman, "Computer Programming in C", Prentice Hall of India, 1995.

References:

Marvin K. Simon, Sami M. Hinedi, William C. Lindsey, Digital Communication Techniques: Signal Design and Detection, 2015, 1st Edition, Pearson Education, India

Richard J. Tervo, Practical Signals Theory with MATLAB Applications, 2013, 1st Edition, Wiley, India.

<http://nptel.ac.in/courses/117101051/>

**Course Code: MTE 122**

**Credit Units: 01**

**Course Contents:**

**List of Experiments:**

1. Measurement of thickness & resolution of LVDT (Displacement measurement )
2. Study of vibration measurement by stroboscope (natural frequency of a cantilever)
3. Measurement of angular frequency (speed of rotation objects) measurement by stroboscope.
4. Study of calibration of pressure transducer.
5. Measurement of free (Proving ring)
6. Study of torque cell.

**Examination Scheme:**

IA				EE	
A	PR	LR	V	PR	V
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

**Course Objective:**

Student must develop his/her ability to analyze and solve problems methodically as well as manage individual and team projects with appropriate consideration of engineering and financial aspects.

Definition, Identifying requirements & analyzing needs, Exploring and evaluating concepts, Prototyping and modeling systems, Testing, Deploying and validating a design, Documentation. Definition of a project, Why project management, Project life cycle, Organization structures (functional vs. matrix and borrowed resources), Translating needs into requirements, Survey of local & global industrial economic scenario. Project execution (configuration management), Project control (measuring work performance), and live demo.

**Examination Scheme:**

<b>Components</b>	<b>A</b>	<b>CT</b>	<b>S/V/Q</b>	<b>HA</b>	<b>EE</b>
<b>Weightage (%)</b>	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance.

Course Objective

To exemplify in depth knowledge of Satellite communication system and to have a detailed understanding of the critical RF parameters in satellite transceiver and their effects on performance. To have a detailed understanding of the fundamental theory and concepts of the Global Positioning and inertial navigation System.

Module 1.

Overview of satellite communications, Types of satellites, Kepler's three laws of planetary motion, Orbital elements, Look angle determination, Orbital pert.

Module 2.

Launch vehicles, Launching techniques, Orbital effects in satellite communication systems performance, Satellite subsystems, Satellite constellations.

Module 3.

Global Navigation Satellite Systems, Basic concepts of GPS, Space segment, Control segment, user segment, GPS constellation, GPS measurement characteristics, Selective availability, Anti spoofing (AS). Applications of satellite and GPS for 3D position, Velocity, determination as function of time, Regional navigation systems.

Module 4.

Introduction to Inertial Navigation, Inertial sensors, Navigation coordinates, System implementations, System, Level error models, introduction to Differential GPS, LADGPS, WADGPS, WAAS, GEO Uplink Subsystem (GUS), Clock steering algorithms, GEO orbit determination.

Module 5.

Distress and safety, Cospas, Sarsat, Inmarsat distress system, Location-based service, Problems. Overview of sensors, Optical sensors: cameras, Non-Optical sensor, Image processing, Image interpretation, System characteristics. Introduction to remote sensing systems, Commercial imaging, Digital globe, GeoEye, Meteorology, Meteosat, Land observation, Landsat, Remote sensing data.

Module 6.

Introduction, Satellite radio systems, XM satellite radio inc., Sirius satellite radio, World space, Direct multimedia broadcast, MBCO and TU multimedia, European initiatives, Direct To Home (DTH) television, Implementation issues, DTH Services, representative DTH Systems, Military multimedia broadcasts, US Global Broadcast Service (GBS), Business TV(BTV), GRAMSAT, Specialized services, Email, Video conferencing, Internet.

**Examination Scheme:**

<b>Components</b>	<b>A</b>	<b>CT</b>	<b>HA</b>	<b>EE</b>
<b>Weightage (%)</b>	05	45	50	00

**Text and reference books:**

Text :

Mohinder S. Grewal, Lawrence R. Weill, Angus P. Andrews, Global Positioning Systems, Inertial Navigation, and Integration, 2011, 1st Edition, John Wiley & Sons, New Jersey

T. Pratt, C.W. Boastian, Jeremy Allnut, Satellite Communication, 2013, 2nd Edition, John Wiley & Sons, New Jersey

Reference :

Madhavendra Richaria, Mobile Satellite Communications: Principles and Trends, 2014, 2nd Edition, John Wiley & Sons, New Jersey.

D. Roddy, Satellite Communications, 2011, 4th Edition, McGraw Hill, New York.

## Course Objective

To exemplify in depth knowledge of Optical communication system and to have a detailed understanding of the critical parameters in optics transceiver and their effects on performance. To have a detailed understanding of the fundamental theory and concepts of the various navigation System.

## Module 1.

Wave propagation, Dispersion and its limitations, losses and non-linear effects.

## Module 2.

Semiconductor optical amplifier, Raman amplifier, EDFA.

## Module 3.

Need pre-compensation schemes, best compensation techniques, dispersion compensating fibers, optical filters, fiber Bragg grating

## Module 4.

Fiber soliton, soliton based communications, loss managed solitons, dispersion-managed solitons, high speed soliton systems, WDM soliton systems.

## Module 5.

Basic concepts, modulation formats, demodulation schemes, bit error rate, sensitivity degradation.

## Module 6.

Concept, advantages of RoF in mobile communication networks, macro diversity and micro diversity in RoF, RoF for hyper LAN 2 microcellular communication networks, RoF multiplexing techniques.

**Examination Scheme:**

<b>Components</b>	<b>A</b>	<b>CT</b>	<b>HA</b>	<b>EE</b>
<b>Weightage (%)</b>	05	25	20	50

**Text and reference books:**

## Text Books:

1. G. P. Aggarwal, "Fiber-Optic Communication Systems", John Wiley & Sons, 2012.

## Reference books and other resources:

1. Djafar K. Mynbaev, "Fiber-Optic Communication Technology", Prentice Hall, 2001.
2. Leonid Kazovsky, Sergio Benedetto and Alan Willner, "Optical Fiber Communication Systems", Artech House, 1996.
3. Hamed Al-Raweshidy and Shozo Komaki, "Radio Over Fiber Technologies for Mobile Communication Networks", Artech House, 2002.
4. Related IEEE/IEE publications.



**Course Objective:**

The course is intended to give a live blogging kind data on various topic and socialize his or her content

**Course Contents:****Examination Scheme:**

<b>Components</b>	<b>A</b>	<b>CT</b>	<b>HA</b>	<b>EE</b>
<b>Weightage (%)</b>	05	45	50	00

**Course Code: MTE111**

**Credit Units: 01**

**Course Objective:**

The Course is designed to give an overview of the four broad categories of English Communication thereby enhance the learners' communicative competence.

**Course Contents:**

**Module I: Listening Skills**

Effective Listening: Principles and Barriers  
Listening Comprehension on International Standards

**Module II: Speaking Skills**

Pronunciation and Accent  
Reading excerpts from news dailies & magazines  
Narrating Incident; Story telling.  
Extempore & Role Plays

**Module III: Reading Skills**

Vocabulary: Synonyms, antonyms, diminutives, homonyms, homophones  
Idioms & phrases  
Foreign words in English

**Module IV: Writing Skills**

Writing Paragraphs  
Précis Writing  
Letter writing  
Coherence and structure  
Essay writing

**Module V: Activities**

News reading  
Picture reading  
Movie magic  
Announcements

**Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>CAF</b>	<b>V</b>	<b>GD</b>	<b>GP</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	25	10	10	10	5

CAF – Communication Assessment File

GD – Group Discussion

GP – Group Presentation

**Text & References:**

- Working in English, Jones, Cambridge
- Business Communication, Raman – Prakash, Oxford
- Speaking Personally, Porter-Ladousse, Cambridge
- Speaking Effectively, Jermy Comfort, et.al, Cambridge

# **BEHAVIOURAL SCIENCE - I**

## **(SELF-DEVELOPMENT AND INTERPERSONAL SKILLS)**

**Course Code:** MTE 143

**Credit Units:** 01

### **Course Objective:**

This course aims at imparting an understanding of:

Self and the process of self exploration

Learning strategies for development of a healthy self esteem

Importance of attitudes and their effect on work behaviour

Effective management of emotions and building interpersonal competence.

### **Course Contents:**

#### **Module I: Understanding Self**

Formation of self concept

Dimension of Self

Components of self

Self Competency

#### **Module II: Self-Esteem: Sense of Worth**

Meaning and Nature of Self Esteem

Characteristics of High and Low Self Esteem

Importance & need of Self Esteem

Self Esteem at work

Steps to enhance Self Esteem

#### **Module III: Emotional Intelligence: Brain Power**

Introduction to EI

Difference between IQ, EQ and SQ

Relevance of EI at workplace

Self assessment, analysis and action plan

#### **Module IV: Managing Emotions and Building Interpersonal Competence**

Need and importance of Emotions

Healthy and Unhealthy expression of emotions

Anger: Conceptualization and Cycle

Developing emotional and interpersonal competence

Self assessment, analysis and action plan

#### **Module V: Leading Through Positive Attitude**

Understanding Attitudes

Formation of Attitudes

Types of Attitudes

Effects of Attitude on

Behaviour

Perception

Motivation

Stress

Adjustment

Time Management

Effective Performance

Building Positive Attitude

#### **Module VI: End-of-Semester Appraisal**

- Viva based on personal journal
- Assessment of Behavioural change as a result of training
- Exit Level Rating by Self and Observer

**Text & References:**

- Towers, Marc: Self Esteem, 1<sup>st</sup> Edition 1997, American Media
- Pedler Mike, Burgoyne John, Boydell Tom, A Manager's Guide to Self-Development: Second edition, McGraw-Hill Book Company.
- Covey, R. Stephen: Seven habits of Highly Effective People, 1992 Edition, Simon & Schuster Ltd.
- Khera Shiv: You Can Win, 1<sup>st</sup> Edition, 1999, Macmillan
- Gegax Tom, Winning in the Game of Life: 1<sup>st</sup> Edition, Harmony Books
- Chatterjee Debashish, Leading Consciously: 1998 1<sup>st</sup> Edition, Viva Books Pvt. Ltd.
- Dr. Dinkmeyer Don, Dr. Losoncy Lewis, The Skills of Encouragement: St. Lucie Press.
- Singh, Dalip, 2002, Emotional Intelligence at work; First Edition, Sage Publications.
- Goleman, Daniel: Emotional Intelligence, 1995 Edition, Bantam Books
- Goleman, Daniel: Working with E.I., 1998 Edition, Bantam Books.

## FRENCH - I

**Course Code:** FTF 144

**Credit Units: 02**

### **Course Objective:**

To familiarize the students with the French language

- with the phonetic system
- with the syntax
- with the manners
- with the cultural aspects

### **Course Contents:**

#### **Module A: pp. 01 to 37: Unités 1, 2, Unité 3 Objectif 1,2**

Only grammar of Unité 3: objectif 3, 4 and 5

#### **Contenu lexical: Unité 1: Découvrir la langue française : (oral et écrit)**

1. se présenter, présenter quelqu'un, faire la connaissance des

autres, formules de politesse, rencontres

2. dire/interroger si on comprend
3. Nommer les choses

#### **Unité 2: Faire connaissance**

1. donner/demander des informations sur une personne, premiers contacts, exprimer ses goûts et ses préférences
2. Parler de soi: parler du travail, de ses activités, de son pays, de sa ville.

#### **Unité 3: Organiser son temps**

1. dire la date et l'heure

#### **Contenu grammatical:**

1. organisation générale de la grammaire
2. article indéfini, défini, contracté
3. nom, adjectif, masculin, féminin, singulier et pluriel
4. négation avec « de », "moi aussi", "moi non plus"
5. interrogation : Inversion, est-ce que, qui, que, quoi, qu'est-ce que, où, quand, comment, quel(s), quelle(s)  
Interro-négatif : réponses : oui, si, non
6. pronom tonique/disjoint- pour insister après une préposition
7. futur proche

#### **Examination Scheme:**

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

#### **Text & References:**

- le livre à suivre : Campus: Tome 1

## GERMAN - I

**Course Code:** FTG 145

**Credit Units:** 02

### **Course Objective:**

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.

To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

### **Course Contents:**

#### **Module I: Introduction**

Self introduction: heissen, kommen, wohnen, lernen, arbeiten, trinken, etc.

All personal pronouns in relation to the verbs taught so far.

Greetings: Guten Morgen!, Guten Tag!, Guten Abend!, Gute Nacht!, Danke sehr!, Danke!, Vielen Dank!, (es tut mir Leid!),

Hallo, wie geht's?: Danke gut!, sehr gut!, prima!, ausgezeichnet!,  
Es geht!, nicht so gut!, so la la!, miserabel!

#### **Module II: Interviewspiel**

To assimilate the vocabulary learnt so far and to apply the words and phrases in short dialogues in an interview – game for self introduction.

#### **Module III: Phonetics**

Sound system of the language with special stress on Diphthongs

#### **Module IV: Countries, nationalities and their languages**

To make the students acquainted with the most widely used country names, their nationalities and the language spoken in that country.

#### **Module V: Articles**

The definite and indefinite articles in masculine, feminine and neuter gender. All Vegetables, Fruits, Animals, Furniture, Eatables, modes of Transport

#### **Module VI: Professions**

To acquaint the students with professions in both the genders with the help of the verb “sein”.

#### **Module VII: Pronouns**

Simple possessive pronouns, the use of my, your, etc.

The family members, family Tree with the help of the verb “to have”

#### **Module VIII: Colours**

All the color and color related vocabulary – colored, colorful, colorless, pale, light, dark, etc.

#### **Module IX: Numbers and calculations – verb “kosten”**

The counting, plural structures and simple calculation like addition, subtraction, multiplication and division to test the knowledge of numbers.

“Wie viel kostet das?”

#### **Module X: Revision list of Question pronouns**

W – Questions like who, what, where, when, which, how, how many, how much, etc.

### **Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>C</b>	<b>I</b>	<b>V</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

**Text & References:**

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmoe, Deutsch als Fremdsprache 1A, Grundkurs

## SPANISH – I

**Course Code:** FLS 146

**Credit Units:** 02

### **Course Objective:**

To enable students acquire the relevance of the Spanish language in today's global context, how to greet each other. How to present / introduce each other using basic verbs and vocabulary.

### **Course Contents:**

#### **Module I**

A brief history of Spain, Latin America, the language, the culture...and the relevance of Spanish language in today's global context.

Introduction to alphabets

#### **Module II**

Introduction to 'Saludos' (How to greet each other. How to present / introduce each other).

Goodbyes (despedidas)

The verb llamarse and practice of it.

#### **Module III**

Concept of Gender and Number

Months of the years, days of the week, seasons. Introduction to numbers 1-100, Colors,

Revision of numbers and introduction to ordinal numbers.

#### **Module IV**

Introduction to SER and ESTAR (both of which mean To Be).Revision of 'Saludos' and 'Llamarse'. Some adjectives, nationalities, professions, physical/geographical location, the fact that spanish adjectives have to agree with gender and number of their nouns. Exercises highlighting usage of Ser and Estar.

#### **Module V**

Time, demonstrative pronoun (Este/esta, Aquel/aquella etc)

#### **Module VI**

Introduction to some key AR /ER/IR ending regular verbs.

### **Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>C</b>	<b>I</b>	<b>V</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

### **Text & References:**

- Español, En Directo I A
- Español Sin Fronteras



## CHINESE – I

**Course Code: FLC 148**

**Credit Units: 02**

### **Course Objective:**

There are many dialects spoken in China, but the language which will help you through wherever you go is Mandarin, or Putonghua, as it is called in Chinese. The most widely spoken forms of Chinese are Mandarin, Cantonese, Gan, Hakka, Min, Wu and Xiang. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

### **Course Contents:**

#### **Module I**

Show pictures, dialogue and retell.

Getting to know each other.

Practicing chart with Initials and Finals. (CHART – The Chinese Phonetic Alphabet Called “Hanyu Pinyin” in Mandarin Chinese.)

Practicing of Tones as it is a tonal language.

Changes in 3<sup>rd</sup> tone and Neutral Tone.

#### **Module II**

Greetings

Let me Introduce

The modal particle “ne”.

Use of Please ‘qing” – sit, have tea ..... etc.

A brief self introduction – Ni hao ma? Zaijian!

Use of “bu” negative.

#### **Module III**

Attributives showing possession

How is your Health? Thank you

Where are you from?

A few Professions like – Engineer, Businessman, Doctor, Teacher, Worker.

Are you busy with your work?

May I know your name?

#### **Module IV**

Use of “How many” – People in your family?

Use of “zhe” and “na”.

Use of interrogative particle “shenme”, “shui”, “ma” and “nar”.

How to make interrogative sentences ending with “ma”.

Structural particle “de”.

Use of “Nin” when and where to use and with whom. Use of guixing.

Use of verb “zuo” and how to make sentences with it.

#### **Module V**

Family structure and Relations.

Use of “you” – “mei you”.

Measure words

Days and Weekdays.

Numbers.

Maps, different languages and Countries.

**Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>C</b>	<b>I</b>	<b>V</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

**Text & References:**

- “Elementary Chinese Reader Part I” Lesson 1-10

# LOW POWER VLSI DESIGN

**Course Code:** MTE 201

**Credit Units:** 04

## Course Objective:

This course deals with the design issues of low power circuit in digital perspective. In this course, MOS transistor modeling is emphasized for low power applications. After completing this course the student have thorough knowledge of modeling of various MOS parameter and SPICE simulation for low power applications, correlation analysis in DSP systems, Monte Carlo simulation, low power memory design.

## Course Contents:

### Module I: Low Power VLSI Design Methodology: An overview

Need for low power VLSI design, sources of power dissipation in CMOS ( $S > C$  current, leakage current, static current), physics of power dissipation in CMOS devices, CMOS low voltage analytical model. CMOS power supply voltage scaling.

### Module II: Principles of low power design

Sources of power dissipation, Impact of transistor sizing and oxide thickness, Technology & Device innovation.

### Module III: Simulation Power analysis

SPICE circuit simulators, gate level logic simulation, capacitive power estimation, static state power, gate level capacitance estimation, architecture level analysis, data correlation analysis in DSP systems. Monte Carlo simulation.

Probabilistic power analysis: Random logic signals, probability & frequency, probabilistic power analysis techniques, signal entropy.

### Module IV: Low Power Design

**Circuit level:** Power consumption in circuits. Flip Flops & Latches design, high capacitance nodes, low power digital cells library

**Logic level:** Gate reorganization, signal gating, logic encoding, state machine encoding, pre-computation logic.

### Module V: Low power: Special Techniques

Power dissipation in clock distribution and reduction techniques, CMOS floating node, Low power bus, Switching activity reduction, Parallel architecture with voltage reduction, Flow graph transformation.

Adiabatic switching concepts, Multi threshold CMOS designing.

## Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

## Text & References:

### Text:

- Gary K. Yeap, "Practical Low Power Digital VLSI Design", KAP, 2002
- Rabaey, Pedram, "Low power design methodologies" Kluwer Academic, 1997

### References:

- Kaushik Roy, Sharat Prasad, "Low-Power CMOS VLSI Circuit Design" Wiley, 2000

## High Level System Design & Modeling

Course Code MTE 202

Credit Units 04

### Course Objective:

#### Unit 1.

Introduction : Design Representation of Digital Systems, levels of abstraction, design methodologies, System level methodologies, System specification and design.

Model Taxonomy : State-Oriented models - finite-state machine, Petri net, Hierarchical concurrent finite state machine; Activity-oriented models - Dataflow graph, flow charts; Heterogeneous model - control/data flow graph, Object oriented model, Program-state machine;

#### Unit 2.

Architectural Taxonomy : Application specific architectures - Controller Architecture, Data path architecture, Finite-state machine with data path; Processors - Complex instruction set Computer, Reduced instruction set Computer; Vector machine - Very long instruction word Computer; Parallel processors.

#### Unit 3

Embedded Systems Specification Requirements Languages: Characteristics of Conceptual models - Concurrency, State Transitions, Hierarchy, Programming Constructors, Behavioral Completion, Communication, Synchronization, Exception handling, Timing; Comparative features of Specification languages - VHDL, Verilog, HardwareC, State-charts, Esterel; Embedded system specification in speccharts.

#### Unit 4

A Specification example of Telephone answering machine : Specification capture with speccharts, Sample test bench, Advantage of executable specifications; Strengths of the PSM model - Hierarchy, State transitions, Programming Constructors, Concurrency, Exception handling, Completion.

#### Unit 5

System Partitioning : Structural versus functional Partitioning. Partitioning issues - Specification extraction level, Granularity, System Component allocation, Metrics and Estimations, Objective functions and closeness functions, Partitioning Algorithm, Output. Basic Partitioning algorithms - Random mapping, Hierarchical clustering, Multistage Clustering, Group Migration, Radio cut and Simulated Annealing.

### Examination Scheme:

Components	A	CT	HA	EE
Weightage (%)	05	15	10	70

### Text & References:

Text.

Abstract State Machines: A Method for High-Level System Design and Analysis, Egon Boerger, Robert Staerk, Springer.

Specification and Design of Embedded Systems by Daniel D. Gajski, PTR Prentice Hall Englewood New Jersey

Reference.

High Level System Modeling : Specification and Design Methodologies edited by Ronald Waxman, Kluwer Academic Publishers

**Course Objective:**

Analyze microwave networks using S and mixed mode S parameters. CO2 Design microwave filters using various methods.

Unit 1. Microwave Network Analysis Concept of differential signal, coupling and crosstalk, Introduction to S parameters, properties of S parameters, Single ended, mixed mode, Single ended to mixed mode conversion.

Unit 2. Design of Microwave filters Introduction, Microwave filter structures, Planar, Active, Superconductive, SAW and micro-machined filters etc., Pseudo-elliptic Filters, Prototype Synthesis Example, Design of Hilbert Filters, Realizations and Measured Performance.

Unit 3. Advanced Microwave Integrated Circuits Multi-Standard Multi-Band Reconfigurable LNA, LNA Inventions, Multiband MultiStandard LNA with CPW Transmission Line Inductor.

Unit 4. Microstrip Antenna Microstrip Patch antennas, variations of shorted patch antenna, dual frequency shorted patch antennas, low cross polarized antennas, dual arm printed monopole antenna: Coplanar Waveguide Feeding.

Unit 5. Antennas on Impedance Substrates High Impedance Surface (HIS), surface wave bends, reflection phase, bandwidth, Antennas on HIS, diffraction control, tunable impedance substrate, holographic artificial impedance substrate.

**Examination Scheme:**

Components	A	CT	HA	EE
Weightage (%)	05	15	10	70

**Text & References:**

## Text Books:

1. Allan Huynh, Magnus Karlsson and Shaofang Gong, "Advanced Microwave Circuits and Systems", In Tech, 2010.
2. Pierre Jarry and Jacques Beneat, "Design and Realizations of Miniaturized Fractal Microwave and RF Filters", Wiley-Blackwell, 2009.

## References:

3. Arjuna Marzuki, Ahmad Ismat Abdul Rahim and Mourad Loulou, "Advances in Monolithic Microwave Integrated Circuits for Wireless Systems: Modeling and Design Technologies", Information Science Reference, 2012.
  4. Rod Waterhouse, "Printed Antennas for Wireless Communications", John Wiley & Sons, 2007.
- Reference books and other resources: 1. Related IEEE publications

**List of Experiments**

1. Designing CMOS inverter for low power.
2. Designing CMOS AND/NAND gate for low power
3. Designing CMOS XOR/X-NOR gate for low power
4. Designing CMOS Half adder for low power
5. Designing CMOS Full adder for low power
6. Designing Static / Dynamic logic circuits (register cell) for low power
7. Designing Bi-CMOS circuit .
8. Designing latches for low power
9. Designing CMOS J-K flip flop gate for low power
10. Designing CMOS S-R flip flop for low power

**Examination Scheme:**

Components	A	PR	LR	EE
Weightage (%)	05	25	20	50

**Topics for the Project**

Students are required to select one topic for the project. A final report comprising of the following headers to be submitted to the committee prior to presentation.

1. Cover page-indicating title of the project, Guide's name
2. Introduction
3. Literature Survey
4. Methodology/Work Plan
5. Experimental set-up
6. Experimental data
7. Results and Discussion
8. Conclusion
9. Future Plan
10. References
11. Acknowledgments

**Examination Scheme:**

Project work	65 %
Seminar	20 %
Viva	10 %
Attendance	5%

**Total: 100**

**Examination Scheme:**

Components	A	PR	LR	EE
Weightage (%)	05	25	20	50



**Course Code** MTE 222

**Credit Units 01**

**List of experiments**

- 1 Realization of a Boolean function
- 2 Design of decoder and encoder
- 3 Design of multiplexer and de multiplexer
- 4 Design of code converters
- 5 Full adder and full subtractor design modeling
- 6 Design of 8-bit Arithmetic logic unit
- 7 HDL model for flip flops
- 8 Design of counters
- 9 HDL code for universal shift register
- 10 HDL code for carry look ahead adder
- 11 HDL code to detect a sequence
- 12 Chess clock controller FSM using HDL
- 13 Traffic light controller using HDL
- 14 Elevator design using HDL code

**Examination Scheme:**

<b>Components</b>	<b>A</b>	<b>PR</b>	<b>LR</b>	<b>EE</b>
<b>Weightage (%)</b>	05	25	20	50

**Course Code** MTE 223**Credit Units 01****List of experiments**

1. Analysis and Design Equal and Unequal Wilkinson Power division using Electromagnetic Simulation for L and S- Band Application.
2. Development of Wideband Phase Shifter for L and S band Applications.
3. Design and Development of Microwave Filters.
4. Design and Development of Microwave Coupler.
5. Design and Development of Microwave Resonators.
6. Design and Perform the Electromagnetic Simulation of High Pass Filter Using Stepped impedance and Richard Transform Method.
7. Design and Analysis of Narrow band Microwave Amplifier for L and S Band applications using Specific Gain and Maximum Gain Method.

**Examination Scheme:**

<b>Components</b>	<b>A</b>	<b>PR</b>	<b>LR</b>	<b>EE</b>
<b>Weightage (%)</b>	05	25	20	50

**Course Code** MTE 204

**Credit Units 04**

**Course Objective:**

To gain knowledge in physical, MAC and routing layers of WSN (Wireless Sensor Networks). 2. To learn WSN standards. 3. To analyze the performance of WSN.

**Module 1**

Challenges and enabling technologies for Wireless Sensor Networks, Single-Node architecture, Hardware components, Energy consumption of sensor node, Sensor network scenarios.

**Module 2**

Physical layer and transceiver design considerations in WSNs, MAC Protocols for WSNs: Schedule-based protocols, Random Access-based protocols, Sensor-MAC: Periodic listen and sleep operations, Schedule selection and coordination, Schedule synchronization, Adaptive listening, Access control and data exchange, Message passing.

**Module 3**

Challenges for routing, Data centric and flat architecture.

**Module 4**

Hierarchical protocols, Geographical routing, QoS based protocols

**Module 5**

802.15.4 - PHY and MAC, Zigbee, 6LoWPAN, Challenges in localization, Ranging techniques, Range-based localization, Range-free localization.

**Module 6**

Introduction, WSN - operating system design issues, Examples of OS, TinyOS.

**Examination Scheme:**

<b>Components</b>	<b>A</b>	<b>PR</b>	<b>LR</b>	<b>EE</b>
<b>Weightage (%)</b>	05	25	20	50

**Text & References:**

Text

Holger Karl, Andreas Willig, Protocols and Architectures for Wireless Sensor Networks, 2011, 1 st Edition, John Wiley & Sons, New Jersey.

Kazem Sohraby, Daniel Minoli, Taieb Znati, Wireless Sensor Networks-Technology, Protocols, and Applications, 2012, 1st Edition, John Wiley & Sons, New Jersey.

Reference

Ian F. Akyildiz, Mehmet Can Vuran, Wireless Sensor Networks, 2011, 1st Edition, John Wiley & Sons, New Jersey.



**Course Objective:**

**UNIT-1 MEMS Fabrication:** Conventional MEMS fabrication using VLSI technology: lithography, chemical etching: isotropic and anisotropic, Plasma etching, Reactive ion etching, Oxidation, Chemical vapor deposition, LPCVD, PECVD, Surface micromachining, LIGA, single layer and higher layer fabrication, Non-conventional MEMS fabrication: laser micromachining and welding micromachining(EDM & ECM), Microstereolithography: scanning process, dynamic mask process, Electronic packaging.

**UNIT-2 MEMS Design and Analysis:** Basic concepts of design of MEMS devices and processes, Design for fabrication, Other design considerations, Analysis of MEMS devices, Modeling and Simulation.

**UNIT-3 MEMS Sensors:** Physical Micro Sensors: Classification of physical sensors, Integrated, Intelligent, or Smart Sensors, Sensor Principles and Examples: Thermal Sensors, Electrical Sensor, Mechanical Sensors, Chemical and Biosensors, Application Areas: RF MEMS and Optical MEMS, Medical Devices e.g. DNA-chip, micro-arrays, Pressure sensors with embedded electronics(Analog/Mixed signal): Accelerometer with transducer, Gyroscope, Bolo meter design.

**UNIT-4 MEMS Characterization:** Technologies for MEMS characterization, Scanning Probe Microscopy (SPM), Atomic Force Microscopy (AFM), Scanning Tunneling Microscopy (STM), Magnetic Force Microscopy, Scanning Electron Microscope.

**Examination Scheme:**

Components	A	PR	LR	EE
Weightage (%)	05	25	20	50

- Text/Reference Books:**
1. Gregory T.A. Kovacs, Micromachined Transducers Sourecbook, The McGraw-Hill, Inc. 1998
  2. Stephen D. Senturia, Microsystem Design, Kluar Publishers, 2001
  3. NadimMaluf, An Introduction to Microelectromechanical Systems Engineering, Artech House, 2000.
  4. M.H. Bao, Micro Mechanical Transducers, Volume 8, Handbook of Sensors and Actuators, Elsevier, 2000.
  5. MasoodTabib-Azar, Microactuators, Kluwer, 1998.
  6. LjubisaRistic, Editor, Sensor Technology and Devices, Artech House, 1994
  7. D. S. Ballantine, et. al., Acoustic Wave Sensors, Academic Press, 1997
  8. H. J. De Los Santos, Introduction to Microelectromechanical (MEM) Microwave Systems, Artech, 1999.
  9. James M.Gere and Stephen P. Timoshenko, Mechanics of Materials, 2nd Edition, Brooks/Cole Engineering Division, 1984

## Anandam-II

**Course Code: AND002**

**Credit Units: 02**

### **Course Objective:**

The course is intended to give a live blogging kind data on various topic and socialize his or her content

### **Course Contents:**

### **Examination Scheme:**

<b>Components</b>	<b>A</b>	<b>CT</b>	<b>HA</b>	<b>EE</b>
<b>Weightage (%)</b>	05	45	50	00

## COMMUNICATION SKILLS - II

**Course Code:** MTE 241

**Credit Units: 01**

### **Course Objective:**

To enrich the understanding of English language and communication, structure, style, usage, and vocabulary for global business purposes.

### **Course Contents:**

#### **Module I: Fundamentals of Communication**

Role and purpose of communication: *7 C's of communication*

Barriers to effective communication

Enhancing listening

Forms of Communication: one-to-one, informal and formal

#### **Module II: Verbal Communication (Written)**

Business Letter

Social correspondence

Writing resume and Job applications

#### **Module III: Speaking skills**

Conversational English

Guidelines to give an effective presentation

Activities to include:

Presentations by students

Just a minute

### **Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>CAF</b>	<b>V</b>	<b>GD</b>	<b>GP</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	25	10	10	10	5

CAF – Communication Assessment File



GD – Group Discussion

GP – Group Presentation

**Text & References:**

- Business Communication, Raman – Prakash, Oxford
- Textbook of Business Communication, Ramaswami S, Macmillan
- Speaking Personally, Porter-Ladousse, Cambridge

## BEHAVIOURAL SCIENCE - II

### (BEHAVIOURAL COMMUNICATION AND RELATIONSHIP MANAGEMENT)

**Course Code:** MTE 243

**Credit Units:** 01

#### **Course Objective:**

This course aims at imparting an understanding of:  
Process of Behavioural communication  
Aspects of interpersonal communication and relationship  
Management of individual differences as important dimension of IPR

#### **Course Contents:**

##### **Module I: Behavioural Communication**

Scope of Behavioural Communication  
Process – Personal, Impersonal and Interpersonal Communication  
Guidelines for developing Human Communication skills  
Relevance of Behavioural Communication in relationship management

##### **Module II: Managing Individual Differences in Relationships**

Principles  
Types of issues  
Approaches  
Understanding and importance of self disclosure  
Guidelines for effective communication during conflicts

##### **Module III: Communication Climate: Foundation of Interpersonal Relationships**

Elements of satisfying relationships  
Conforming and Disconfirming Communication  
Culturally Relevant Communication  
Guideline for Creating and Sustaining Healthy Climate

##### **Module IV: Interpersonal Communication**

Imperatives for Interpersonal Communication  
Models – Linear, Interaction and Transaction  
Patterns – Complementary, Symmetrical and Parallel  
Types – Self and Other Oriented  
Steps to improve Interpersonal Communication

##### **Module V: Interpersonal Relationship Development**

Relationship circle – Peer/ Colleague, Superior and Subordinate  
Initiating and establishing IPR  
Escalating, maintaining and terminating IPR  
Direct and indirect strategies of terminating relationship  
Model of ending relationship

##### **Module VI: End-of-Semester Appraisal**

**Viva based on personal journal**  
**Assessment of Behavioural change as a result of training**  
**Exit Level Rating by Self and Observer**

## **Text & References:**

- Vangelist L. Anita, Mark N. Knapp, Inter Personal Communication and Human Relationships: Third Edition, Allyn and Bacon
- Julia T. Wood. Interpersonal Communication everyday encounter
- Simons, Christine, Naylor, Belinda: Effective Communication for Managers, 1997 1<sup>st</sup> Edition Cassell
- Harvard Business School, Effective Communication: United States of America
- Beebe, Beebe and Redmond; Interpersonal Communication, 1996; Allyn and Bacon Publishers.

**Course Code: MTE 244**

**Credit Units: 02**

**Course Objective:**

- To enable the students to overcome the fear of speaking a foreign language and take position as a foreigner speaking French.
- To make them learn the basic rules of French Grammar.

**Course Contents:**

**Module A: pp.38 – 47: Unité 3: Objectif 3, 4, 5, 6**

**Module B: pp. 47 to 75 Unité 4, 5**

**Contenu lexical: Unité 3: Organiser son temps**

1. donner/demander des informations sur un emploi du temps, un horaire SNCF – Imaginer un dialogue
2. rédiger un message/ une lettre pour ...
  - i) prendre un rendez-vous/ accepter et confirmer/ annuler
  - ii) inviter/accepter/refuser
3. Faire un programme d'activités  
imaginer une conversation téléphonique/un dialogue  
Propositions- interroger, répondre

**Unité 4: Découvrir son environnement**

1. situer un lieu
2. s'orienter, s'informer sur un itinéraire.
3. Chercher, décrire un logement
4. connaître les rythmes de la vie

**Unité 5: s'informer**

1. demander/donner des informations sur un emploi du temps passé.
2. donner une explication, exprimer le doute ou la certitude.
3. découvrir les relations entre les mots
4. savoir s'informer

**Contenu grammatical:**

1. Adjectifs démonstratifs
2. Adjectifs possessifs/exprimer la possession à l'aide de :
  - i. « de » ii. A+nom/pronom disjoint
3. Conjugaison pronominale – négative, interrogative -

construction à l'infinitif

4. Impératif/exprimer l'obligation/l'interdiction à l'aide de « il faut... »/ «il ne faut pas... »
5. passé composé
6. Questions directes/indirectes

**Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>C</b>	<b>I</b>	<b>V</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

**Text & References:**

le livre à suivre : Campus: Tome 1

## GERMAN – II

**Course Code: MTE 245**

**Credit Units: 02**

### Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.

To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

Introduction to Grammar to consolidate the language base learnt in Semester I

### Course Contents:

#### **Module I: Everything about Time and Time periods**

Time and times of the day.

Weekdays, months, seasons.

Adverbs of time and time related prepositions

#### **Module II: Irregular verbs**

Introduction to irregular verbs like to be, and others, to learn the conjugations of the same, (fahren, essen, lessen, schlafen, sprechen und ähnliche).

#### **Module III: Separable verbs**

To comprehend the change in meaning that the verbs undergo when used as such

Treatment of such verbs with separable prefixes

#### **Module IV: Reading and comprehension**

Reading and deciphering railway schedules/school time table

Usage of separable verbs in the above context

#### **Module V: Accusative case**

Accusative case with the relevant articles

Introduction to 2 different kinds of sentences – Nominative and Accusative

#### **Module VI: Accusative personal pronouns**

Nominative and accusative in comparison

Emphasizing on the universal applicability of the pronouns to both persons and objects

### **Module VII: Accusative prepositions**

Accusative prepositions with their use

Both theoretical and figurative use

### **Module VIII: Dialogues**

Dialogue reading: ‘In the market place’

‘At the Hotel’

### **Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>C</b>	<b>I</b>	<b>V</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

### **Text & References:**

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

## SPANISH – II

**Course Code:** MTE 246

**Credit Units: 02**

### **Course Objective:**

To enable students acquire more vocabulary, grammar, Verbal Phrases to understand simple texts and start describing any person or object in Simple Present Tense.

### **Course Contents:**

#### **Module I**

Revision of earlier modules.

#### **Module II**

Some more AR/ER/IR verbs. Introduction to root changing and irregular AR/ER/IR ending verbs

#### **Module III**

More verbal phrases (eg, Dios Mio, Que lastima etc), adverbs (*bueno/malo, muy, mucho, bastante, poco*).

Simple texts based on grammar and vocabulary done in earlier modules.

#### **Module IV**

Possessive pronouns

#### **Module V**

Writing/speaking essays like my friend, my house, my school/institution, myself....descriptions of people, objects etc, computer/internet related vocabulary

### **Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>C</b>	<b>I</b>	<b>V</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	20	20	15	5

C – Project + Presentation



## I – Interaction/Conversation Practice

### **Text & References:**

- Español, En Directo I A
- Español Sin Fronteras

**Course Code: MTE 248**

**Credit Units: 02**

**Course Objective:**

Chinese is a tonal language where each syllable in isolation has its definite tone (flat, falling, rising and rising/falling), and same syllables with different tones mean different things. When you say, “ma” with a third tone, it mean horse and “ma” with the first tone is Mother. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

**Course Contents:**

**Module I**

Drills

Practice reading aloud

Observe Picture and answer the question.

Tone practice.

Practice using the language both by speaking and by taking notes.

Introduction of basic sentence patterns.

Measure words.

Glad to meet you.

**Module II**

Where do you live?

Learning different colors.

Tones of “bu”

Buying things and how muchit costs?

Dialogue on change of Money.

More sentence patterns on Days and Weekdays.

How to tell time. Saying the units of time in Chinese. Learning to say useful phrases like – 8:00, 11:25, 10:30 P.M. everyday, afternoon, evening, night, morning 3:58, one hour, to begin, to end ..... etc.

Morning, Afternoon, Evening, Night.

### **Module III**

Use of words of location like-li, wai hang, xia

Furniture – table, chair, bed, bookshelf,.. etc.

Description of room, house or hostel room.. eg what is placed where and how many things are there in it?

Review Lessons – Preview Lessons.

Expression ‘yao’, ‘xiang’ and ‘yaoshi’ (if).

Days of week, months in a year etc.

I am learning Chinese. Is Chinese difficult?

### **Module IV**

Counting from 1-1000

Use of “chang-chang”.

Making an Inquiry – What time is it now? Where is the Post Office?

Days of the week. Months in a year.

Use of Preposition – “zai”, “gen”.

Use of interrogative pronoun – “duoshao” and “ji”.

“Whose”??? Sweater etc is it?

Different Games and going out for exercise in the morning.

### **Module V**

The verb “qu”

Going to the library issuing a book from the library

Going to the cinema hall, buying tickets

Going to the post office, buying stamps

Going to the market to buy things.. etc

Going to the buy clothes .... Etc.

Hobby. I also like swimming.

Comprehension and answer questions based on it.

### **Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>C</b>	<b>I</b>	<b>V</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

**Text & References:**

- “Elementary Chinese Reader Part I” Lesson 11-20

# DIGITAL SIGNAL PROCESSING

**Course Code: MTE 301**

**Credit Units: 04**

## **Course Objective:**

The objective of the course in Digital signal processing is to provide the student with significant skills in general as well as advanced theories and methods for modification, analysis, detection and classification of analog and digital signals. Furthermore the objective is to give the student a broad knowledge of central issues regarding design, realisation and test of analog and in particular digital signal processing systems consisting of hardware and/or software components. The specialization in signal processing makes it possible to study practical or theoretic fields, ranging from mathematics/signal theory over algorithmic design to development of instruments based on hardware and/or software for real time signal

## **Course Contents:**

### **Module I: Discrete time signals and systems in time domain**

Classification of signal, signal processing operations, classification of systems, discrete time systems, examples of types of signal, sampling process, time domain characterization of LTI discrete- time systems, state space representation of LTI discrete time systems.

### **Module II: Discrete time signals in transform domain**

DTFT, properties, applications, inverse DTFT, DFT, properties, applications, inverse DFT, Z-transform, properties, applications, inverse Z-transform, frequency response, transfer function, Fast Fourier transform algorithms: DIT algorithm, DIF algorithm.

### **Module III**

Discrete time processing of continuous time signals: sampling, analog filter design, antialiasing filter design.

### **Module IV: Discrete time processing of discrete- time signals**

Digital filters: Digital filter structure: FIR filter structure, IIR filter structure, Digital filter design: Impulse invariance method, bilinear transform method of IIR filter design, FIR filter design.

## **Examination Scheme:**

<b>Components</b>	<b>A</b>	<b>CT</b>	<b>S/V/Q</b>	<b>HA</b>	<b>EE</b>
<b>Weightage (%)</b>	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;

Att: Attendance.

## **Text & References:**

#### Text

- Prokis, Manolakis: Digital signal processing
- Oppenheim & Schaffer : Digital Signal Processing

#### Reference

- Fafael C. Gonzalez, Richrd E. Woods: Digital Image Processing
- Anil Kumar Jain Fundamentals of Digital Image Processing

**Course Objective:**

To provide the essential knowledge of the antenna parameters and measurements. To design antenna array using synthesize techniques. To design the single element microstrip antenna and array with feeder network and To introduce the types of high impedance surface antennas for various applications.

**Module 1**

Radiation Mechanism, antennas used in various applications and selection criteria, Antenna measurements using anechoic chamber - Radiation pattern, Radiation Intensity, Power gain, Directivity, impedance, Radiation efficiency, Polarization

**Module 2**

Fourier Transform - Woodward-Lawson Sampling - Schelkunoff Method- Dolph-Tchebyscheff - Taylor Line Source Method.

**Module 3**

Basic characteristics, feeding methods, Methods of analysis – Transmission line model and cavity model - Design of Rectangular patch, Circular patch –Microstrip antenna array and feed network.

**Module 4**

Antenna Design using Artificial Impedance Surface Metamaterial- Electromagnetic Band Gap, Defective Ground Structure - High Impedance Surface, Integrated Antenna for wireless personal communication, mobile communication- Antenna design consideration for MIMO diversity systems - medical therapy

**Module 5**

Antenna for Software Defined Radio – Cognitive Radio- Electronic Warfare- Ground penetrating Radar.

**Module 6**

Method of moments (MoM), Finite element method (FEM), Finite difference time domain method (FDTD).

**Examination Scheme:**

Components	A	PR	LR	EE
Weightage (%)	05	25	20	50

**Text & References:**

Text.

C.A. Balanis, Antenna Theory: Analysis and Design, 2016, 4th edition, Wiley, India.

C.A. Balanis, Modern Antenna Handbook, 2012, 1st Edition, Wiley, India.

Reference.

W.L. Stutzman and G.A. Thiele, Antenna Theory and design, 2012, 3rd Edition, Wiley, India.

J. D. Kraus, Antennas and Wave propagation, 2012, 4th Edition, McGraw Hill, Indi

Course Code MTE 303

Credit Units 04

**Course Objective:**

The syllabus is divided into four parts, the first one deal with introduction and fundamental concepts of digital image processing and image enhancement in spatial domain. Second module of the syllabus deals with image processing operations like image enhancement in frequency domain, image restoration respectively. Third and fourth module deals with applications like Image Compression and Object recognition respectively The syllabus helps a student perfect image processing fundamentals. Apart from it image processing application are discussed in detail.

**Course Contents:****Module I: Introduction and Digital Image Fundamentals**

The origins of Digital Image Processing, Examples of Fields that Use Digital Image Processing, Fundamentals Steps in Image Processing, Elements of Digital Image Processing Systems, Image Sampling and Quantization, Some basic relationships like Neighbors, Connectivity, Distance Measures between pixels, Linear and Non Linear Operations. Image Enhancement in the Spatial Domain: Some basic Gray Level Transformations, Histogram Processing, Enhancement Using Arithmetic and Logic operations, Basics of Spatial Filters, Smoothing and Sharpening Spatial Filters, Combining Spatial Enhancement Methods.

**Module II: Image Enhancement in the Frequency Domain**

Introduction to Fourier Transform and the frequency Domain, Smoothing and Sharpening Frequency Domain Filters, Homomorphic Filtering, Image Restoration: A model of The Image Degradation / Restoration Process, Noise Models, Restoration in the presence of Noise Only Spatial Filtering, Periodic Noise Reduction by Frequency Domain Filtering, Linear Position-Invariant Degrations, Estimation of Degradation Function, Inverse filtering, Wiener filtering, Constrained Least Square Filtering, Geometric Mean Filter, Geometric Transformations.

**Module III: Image Compression**

Coding, Interpixel and Psychovisual Redundancy, Image Compression models, Elements of Information Theory, Error free comparison, Lossy compression, Image compression standards. Image Segmentation: Detection of Discontinuities, Edge linking and boundary detection, Thresholding, Region Oriented Segmentation, Motion based segmentation

**Module IV: Representation and Description**

Representation, Boundary Descriptors, Regional Descriptors, Use of Principal Components for Description, Introduction to Morphology, Some basic Morphological Algorithms. Object Recognition: Patterns and Pattern Classes, Decision-Theoretic Methods, Structural Methods.

**Examination Scheme:**

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination;



Att: Attendance.

### **Text & References:**

Text:

- Rafael C. Gonzalez & Richard E. Woods, 2002, "Digital Image Processing", 2<sup>nd</sup> edition, Pearson Education.
- A.K. Jain, 1989, "Fundamental of Digital Image Processing", PHI.

References:

- Bernd Jahne, 2002, "Digital Image Processing", 5<sup>th</sup> Ed., Springer.
- William K Pratt, 2001, "Digital Image Processing: Paks Inside", John Wiley & Sons.

## Project-III

Course Code MTE 361

Credit Units 05

### Course Objective:

Student must develop his/her ability to analyze and solve problems methodically as well as manage individual and team projects with appropriate consideration of engineering and financial aspects.

Definition, Identifying requirements & analyzing needs, Exploring and evaluating concepts, Prototyping and modeling systems, Testing, Deploying and validating a design, Documentation. Definition of a project, Why project management, Project life cycle, Organization structures (functional vs. matrix and borrowed resources), Translating needs into requirements, Survey of local & global industrial economic scenario. Project execution (configuration management), Project control (measuring work performance), and live demo with running experimental designs.

### Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	15	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance.

**List of Experiments:**

1. To generate unit step sequence, exponential sequence and sinusoidal sequence
2. To determine convolution of two given sequences.
3. To plot the frequency response of an FIR system
4. To compute DFT and IDFT of a given sequence
5. To determine the circular convolution of two given sequences
6. To design various analog filters
7. To design FIR filter using Hamming window
8. To convert Analog filter into Digital Filter using bilinear transformation
9. To determine z and inverse z transform of a given sequence
10. To verify 8 points FFT algorithm in decimation in time (DIT) & decimation in frequency (DIF).
11. To determine the filter coefficient using Ramez exchange algorithm.
12. To design an IIR digital filter and its parallel realization.

**Examination Scheme:**

IA				EE	
A	PR	LR	V	PR	V
5	20	20	5	25	25

Note: IA –Internal Assessment, EE - External Exam, PR- Performance, LR – Lab Record, V – Viva.

## Image Processing Lab

**Course Code** MTE 322

**Credit Units** 01

### List of Experiments:

**Note:** Simulate all the programs using MATLAB

1. To study about the basic image processing tools.
2. To write program for Histogram processing.
3. To write program for lossy compression.
4. To write program for lossless compression.
5. To write algorithm for different morphology operations and generate programs.
6. To write program for inverse filtering.
7. To write program for least square filtering.

### Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	20	20	5	25	25

Note: IA –Internal Assessment, EE - External Exam, PR- Performance, LR – Lab Record, V – Viva.

**Course Objective:**

In a fast changing environment an understanding is required which will provide facility to implement a problem for minimum cost, greater efficiency better customer service and higher quality. Optimization Techniques gives us help in solving such type of problems.

**Course Contents:****Module I: Introduction to Optimization**

Statement of an optimization problem, Classification of optimization problems, Optimization techniques, Engg. applications of optimization.

**Module II: Classical Optimization Techniques**

Single variable optimization, Multivariable optimization with no constraints, Multivariable optimization with equality constraints, Multivariable optimization with in equality constraints.

**Module III: Linear Programming**

Standard form of linear programming, Graphical solution, Simplex method, Two-phase simplex method, Computer implementation of the simplex method, Duality theory.

**Module IV: Transportation Problem**

North-West Corner rule, Least cost method, Vogel approximation method, testing for optimality.

**Module V: Non-Linear Programming: One-dimensional minimization methods**

Unimodal function, Dichotomous search, Fibonacci search, Quadratic interpolation method, Cubic interpolation method.

**Module VI: Non-Linear Programming-Unconstrained Optimization Techniques**

Random search method, steepest descent method, Conjugate gradient method, Variable metric method.

**Module VII: Non-Linear Programming - Constrained Optimization Techniques**

Interior Penalty function method, Exterior penalty function method.

**Further Topics in Optimization**

Critical path method (CPM), Program evaluation and review technique (PERT).

**Examination Scheme:**

Components	A	PR	LR	EE
Weightage (%)	05	25	20	50

**Text & References:**

- S.S. Rao, Optimization: Theory and applications, Wiley Eastern Ltd.
- G.V. Reklaitis, Engg. Optimization Methods & applications, Wiley.

**UNIT I:** VLSI Design flow, MOSFET Scaling and small geometry effects, MOS inverters -static characteristics.

**UNIT II : CMOS logic structures:** CMOS complementary logic ,BiCMOS logic, Pseudo Nmos Logic , Dynamic CMOS logic ,C<sup>2</sup>MOS logic, Pass transistor Logic ,CMOS domino logic

**UNIT III: Circuit Design Process:** Stick Diagrams, Design rules and layout ,Stick diagrams for CMOS NAND ,NOR gate and transmission gate, Layout diagram for nMOS ,Euler's path method , Sheet Resistance, gate Capacitance, Wire Parasitic, Drive Large Capacitive Loads.

**UNIT IV: CMOS Subsystem Design:** Architectural issues, Switch Logic, gate logic, Design Example for combinational logic, Design examples for clocked circuits

**UNIT V: CMOS Subsystem design process:** General arrangement of 4bit Arithmetic processor, Design of 4bit shifter, Design of ALU subsystem, Implementation of ALU functions with an adder, Multipliers, Serial Parallel multipliers, Braun array.

**Examination Scheme:**

Components	A	PR	LR	EE
Weightage (%)	05	25	20	50

**TEXT BOOKS:**

1. SungMo Kang & Yusuf Leblebici, "CMOS Digital Integrated Circuits Analysis & Design", MGH, Second Ed., 1999
2. Jan M Rabaey, "Digital Integrated Circuits A Design Perspective", Prentice Hall, 1997
3. Eugene D Fabricus, "Introduction to VLSI Design,"McGraw Hill International Edition.1990

**REFERENCES:**

1. Ken Martin, "Digital Integrated Circuit Design", Oxford University Press, 2000
2. Neil H E West and Kamran Eshranghian, "Principles of CMOS VLSI Design: A System Perspective", AddisonWesley 2<sup>nd</sup>Edition, 2002.
- 3.R. J. Baker, H. W. Li, and D. E. Boyce, "CMOS circuit design, layout, and simulation". New York: IEEE Press, 1998.
4. David A. Hodges, Horace G. Jackson, and Resve A. Saleh, "Analysis and Design of Digital Integrated Circuits", Third Edition, McGrawHill, 2004.

# COMMUNICATION SKILLS - III

**Course Code: MTE 341**

**Credit Units: 01**

## **Course Objective:**

To initiate the learners with the basic mechanics of writing skills and facilitate them with the core skills required for communication in the professional world.

## **Course Contents:**

### **Module I: Mechanics and Semantics of Sentences**

Writing effective sentences

Style and Structure

### **Module II: Developing writing skills**

Inter - office communication: Business Letter; E mails; Netiquette

Intra – office communication: Memos, Notices, Circulars, Minutes

Report Writing

### **Module III: Business Presentations**

Planning, design and layout of presentation

Information Packaging

Audience analysis

Audio visual aids

Speaking with confidence

Case Studies

## **Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>CAF</b>	<b>V</b>	<b>GD</b>	<b>GP</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	25	10	10	10	5

CAF – Communication Assessment File

GD – Group Discussion

GP – Group Presentation

## **Text & References:**

- Krishnaswamy, N, Creative English for Communication, Macmillan
- Raman Prakash, Business Communication, Oxford.

# **BEHAVIOURAL SCIENCE - III (LEADING THROUGH TEAMS)**

**Course Code: MTE 343**

**Credit Units: 01**

## **Course Objective:**

This course aims to enable students to:  
Understand the concept and building of teams  
Manage conflict and stress within team  
Facilitate better team management and organizational effectiveness through universal human values.

## **Course Contents:**

### **Module I: Teams: An Overview**

Team Design Features: team vs. group  
Effective Team Mission and Vision  
Life Cycle of a Project Team  
Rationale of a Team, Goal Analysis and Team Roles

### **Module II: Team & Sociometry**

Patterns of Interaction in a Team  
Sociometry: Method of studying attractions and repulsions in groups  
Construction of sociogram for studying interpersonal relations in a Team

### **Module III: Team Building**

Types and Development of Team Building  
Stages of team growth  
Team performance curve  
Profiling your Team: Internal & External Dynamics  
Team Strategies for organizational vision  
Team communication

### **Module IV: Team Leadership & Conflict Management**

Leadership styles in organizations  
Self Authorized team leadership  
Causes of team conflict  
Conflict management strategies  
Stress and Coping in teams

### **Module V: Global Teams and Universal Values**

Management by values  
Pragmatic spirituality in life and organization  
Building global teams through universal human values  
Learning based on project work on Scriptures like Ramayana, Mahabharata, Gita etc.

### **Module VI: End-of-Semester Appraisal**

Viva based on personal journal  
Assessment of Behavioural change as a result of training  
Exit Level Rating by Self and Observer

## **Text & References:**

- Organizational Behaviour, Davis, K.
- Hoover, Judith D. Effective Small Group and Team Communication, 2002, Harcourt College Publishers
- LaFasto and Larson: When Teams Work Best, 2001, Response Books (Sage), New Delhi
- Dick, Mc Cann & Margerison, Charles: Team Management, 1992 Edition, viva books
- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company
- Smither Robert D.; The Psychology of Work and Human Performance, 1994, Harper Collins College Publishers



## FRENCH – III

Course Code: MTE 344

Credit Units: 02

### Course Objective:

To provide the students with the know-how

- To master the current social communication skills in oral and in written.
- To enrich the formulations, the linguistic tools and vary the sentence construction without repetition.

### Course Contents:

**Module B: pp. 76 – 88 Unité 6**

**Module C: pp. 89 to103 Unité 7**

**Contenu lexical: Unité 6: se faire plaisir**

1. acheter : exprimer ses choix, décrire un objet (forme, dimension, poids et matières) payer
2. parler de la nourriture, deux façons d'exprimer la quantité, commander un repas au restaurant
3. parler des différentes occasions de faire la fête

### Unité 7: Cultiver ses relations

1. maîtriser les actes de la communication sociale courante  
(Salutations, présentations, invitations, remerciements)
2. annoncer un événement, exprimer un souhait, remercier,  
s'excuser par écrit.
3. caractériser une personne (aspect physique et caractère)

### Contenu grammatical:

1. accord des adjectifs qualificatifs
2. articles partitifs
3. Négations avec de, ne...rien/personne/plus
4. Questions avec combien, quel...
5. expressions de la quantité
6. ne...plus/toujours - encore
7. pronoms compléments directs et indirects
8. accord du participe passé (auxiliaire « avoir ») avec  
l'objet direct
9. Impératif avec un pronom complément direct ou indirect
10. construction avec « que » - Je crois que/ Je pense que/ Je  
sais que

### Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

**Text & References:**

le livre à suivre : Campus: Tome 1

# GERMAN - III

**Course Code: MTE 345**

**Credit Units: 02**

## Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.

To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

## Course Contents:

### Module I: Modal verbs

Modal verbs with conjugations and usage, Imparting the finer nuances of the language

### Module II: Information about Germany (ongoing)

Information about Germany in the form of presentations or “Referat”– neighbors, states and capitals, important cities and towns and characteristic features of the same, and also a few other topics related to Germany.

### Module III: Dative case

Dative case, comparison with accusative case, Dative case with the relevant articles

Introduction to 3 different kinds of sentences – nominative, accusative and dative

### Module IV: Dative personal pronouns

Nominative, accusative and dative pronouns in comparison

### Module V: Dative prepositions

Dative preposition with their usage both theoretical and figurative use

### Module VI: Dialogues

In the Restaurant,

At the Tourist Information Office,

A telephone conversation

### Module VII: Directions

Names of the directions

Asking and telling the directions with the help of a roadmap

### Module VIII: Conjunctions

To assimilate the knowledge of the conjunctions learnt indirectly so far

## Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation I – Interaction/Conversation Practice

## Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

# SPANISH – III

**Course Code: MTE 346**

**Credit Units: 02**

## **Course Objective:**

To enable students acquire knowledge of the Set/definite expressions (idiomatic expressions) in Spanish language and to handle some Spanish situations with ease.

## **Course Contents:**

### **Module I**

Revision of earlier semester modules

Set expressions (idiomatic expressions) with the verb *Tener, Poner, Ir....*

Weather

### **Module II**

Introduction to *Gustar...* and all its forms. Revision of *Gustar* and usage of it

### **Module III**

Translation of Spanish-English; English-Spanish. Practice sentences.

How to ask for directions (using *estar*)

Introduction to IR + A + INFINITIVE FORM OF A VERB

### **Module IV**

Simple conversation with help of texts and vocabulary

En el restaurante

En el instituto

En el aeropuerto

### **Module V**

Reflexives

## **Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>C</b>	<b>I</b>	<b>V</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

**Text & References:**

- Español, En Directo I A
- Español Sin Fronteras -Nivel Elemental

# AMITY UNIVERSITY

## RAJASTHAN

### PROGRAMME STRUCTURE

#### Master of Technology

#### (Electronics & Communication Engineering)

#### CHINESE – III

**Course Code: MTE 348**

**Credit Units: 02**

#### Course Objective:

Foreign words are usually imported by translating the concept into Chinese, the emphasis is on the meaning rather than the sound. But the system runs into a problem because the underlying name of personal name is often obscure so they are almost always transcribed according to their pronunciation alone. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

#### Course Contents:

##### Module I

Drills, Dialogue practice, Observe picture and answer the question, Introduction of written characters, Practice reading aloud, Practice using the language both by speaking and by taking notes, Character writing and stroke order

##### Module II

Measure words, Position words e.g. inside, outside, middle, in front, behind, top, bottom, side, left, right, straight, Directional words – beibian, xibian, nanbian, dongbian, zhongjian, Our school and its different building locations, What game do you like? Difference between “hii” and “neng”, “keyi”.

##### Module III

Changing affirmative sentences to negative ones and vice versa, Human body parts, Not feeling well words e.g. ; fever, cold, stomach ache, head ache, Use of the modal particle “le”, Making a telephone call, Use of “jiu” and “cal” (Grammar portion), Automobiles e.g. Bus, train, boat, car, bike etc, Traveling, by train, by airplane, by bus, on the bike, by boat.. etc.

##### Module IV

The ordinal number “di”, “Mei” the demonstrative pronoun e.g. mei tian, mei nian etc, use of to enter to exit, Structural particle “de” (Compliment of degree), Going to the Park., Description about class schedule during a week in school, Grammar use of “li” and “cong”, Comprehension reading followed by questions.

##### Module V

Persuasion-Please don't smoke, Please speak slowly, Praise – This pictorial is very beautiful, Opposites e.g. Clean-Dirty, Little-More, Old-New, Young-Old, Easy-Difficult, Boy-Girl, Black-White, Big-Small, Slow-Fast ... etc, Talking about studies and classmates, Use of “it doesn't matter”, Enquiring about a student, description about study method, Grammar: Negation of a sentence with a verbal predicate.

#### Examination Scheme:

Components	CT1	CT2	C	I	V	A
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**AMITY UNIVERSITY**  
**RAJASTHAN**  
**PROGRAMME STRUCTURE**  
**Master of Technology**  
**(Electronics & Communication Engineering)**

<b>Weightage (%)</b>	20	20	20	20	15	5
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C – Project + Presentation

I – Interaction/Conversation Practice

**Text & References:**

- “Elementary Chinese Reader Part I, Part-2” Lesson 21-30

# AMITY UNIVERSITY

## RAJASTHAN

### PROGRAMME STRUCTURE

#### Master of Technology

#### (Electronics & Communication Engineering)

#### Dissertation

Course Code MTE 450

Credit Units 30

#### Course Objective:

To give an in depth understanding of the research problem and to generate experimental expertise. The students will work in a R & D institutions / industries.

#### Course Contents:

#### To carry out a research project on specific problem for dissertation

Dissertation of six months in a R&D institution or industry. The students will work on a project either under the joint guidance of a Professor/Scientist in that organization. The work after completion will be submitted to Amity Institute of Renewable and Alternative Energy(AIRAE) , which is a part of their M. Tech (Solar and Alternative Energy) degree programme of this Amity University Rajasthan.

#### Examination Scheme:

Project	: 60%
Presentation/Seminar	: 20%
Viva	: 20%
Total	: 100%