Master of Technology
(Electronics & Communication Engineering)

Programme code: MTE

Duration – 2 years full Time

Programme Structure
and
Curriculum & Scheme of Examination

2011

AMITY UNIVERSITY HARYANA
PREAMBLE

Amity University aims to achieve academic excellence by providing multi-faceted education to students and encourage them to reach the pinnacle of success. The University has designed a system that would provide rigorous academic programme with necessary skills to enable them to excel in their careers.

This booklet contains the Programme Structure, the Detailed Curriculum and the Scheme of Examination. The Programme Structure includes the courses (Core and Elective), arranged semester wise. The importance of each course is defined in terms of credits attached to it. The credit units attached to each course has been further defined in terms of contact hours i.e. Lecture Hours (L), Tutorial Hours (T), Practical Hours (P). Towards earning credits in terms of contact hours, 1 Lecture and 1 Tutorial per week are rated as 1 credit each and 2 Practical hours per week are rated as 1 credit. Thus, for example, an L-T-P structure of 3-0-0 will have 3 credits, 3-1-0 will have 4 credits, and 3-1-2 will have 5 credits.

The Curriculum and Scheme of Examination of each course includes the course objectives, course contents, scheme of examination and the list of text and references. The scheme of examination defines the various components of evaluation and the weightage attached to each component. The different codes used for the components of evaluation and the weightage attached to them are:

<table>
<thead>
<tr>
<th>Components</th>
<th>Codes</th>
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It is hoped that it will help the students study in a planned and a structured manner and promote effective learning. Wishing you an intellectually stimulating stay at Amity University.

July, 2011
## PROGRAMME STRUCTURE

### FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<th>Tutorial (T) Hours Per Week</th>
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### SUMMER PROJECT - 8 – WEEKS

### THIRD SEMESTER

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**FOURTH SEMESTER**

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Curriculum & Scheme of Examination

LOW POWER VLSI DESIGN

Course Code: MTE 101 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: Introduction to Low Power VLSI Design
Need for low power VLSI chips, Sources of power dissipation on Digital Integrated circuits. Emerging Low power approaches. Physics of power dissipation in CMOS devices.

Module II: Device & Technology Impact on Low Power
Dynamic dissipation in CMOS, Transistor sizing & gate oxide thickness, Impact of technology Scaling, 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 Architecture & Systems
Power & performance management, switching activity reduction, parallel architecture with voltage reduction, flow graph transformation, low power arithmetic components, low power memory design.

Module VI: Low Power Clock Distribution
Power dissipation in clock distribution, single driver Vs distributed buffers, Zero skew Vs tolerable skew, chip & package co design of clock network Algorithm & architectural level methodologies: Introduction, design flow, Algorithmic level analysis & optimization, Architectural level estimation & synthesis.

Examination Scheme:

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<tr>
<th>Components</th>
<th>A</th>
<th>CT</th>
<th>S/V/Q</th>
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CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text:

References:
ADVANCED DIGITAL COMMUNICATION SYSTEMS

Course Code: MTE 102 Credit Units: 04

Course Objective:

The purpose of this course is to provide a thorough knowledge of Advanced digital communications systems with in depth study of various digital modulation techniques, spread spectrum techniques, and information theory.

Course Contents:

Module I: Introduction
Geometric representation of modulation signals, Liner modulation technique, $\pi/4$ QPSK, Offset QPSK, Constant envelop modulation technique, MSK, GMSK, Linear & constant envelop modulation techniques, M-ary PSK, M-ary QAM.

Module II
Spread spectrum system like DS-Spread spectrum, Pseudo noise sequences, Performance of DS-SS, Frequency Hopping system, Modulation Error Performance for Binary signal in AWGN, Detection of M-ary orthogonal, M-ary orthogonal with non-coherent detection.

Module III: Equalization
Adaptive equalizer, Linear Equalizer, Nonlinear Equalizer, ISI interference, RAKE receiver, Maximum likelihood sequence estimation (MLSE) equalizer.

Module IV
Raelley fading distribution, Rician fading distribution, Speed coding, Characterization of speech signals, Vector quantization, Adaptive quantization, Power spectrum for general memory less modulation.

Examination Scheme:

<table>
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<tr>
<th>Components</th>
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Text & References:

STOCHASTIC METHODS

Course Code: MTE 103
Credit Units: 04

Course Objective:
This course deals with the comprehensive knowledge of Probability theory, probability distributions, transition probabilities, Markov Chains, birth and death processes, Network of queues, correlation and regression analysis and Analysis of variance.

Course Contents:

Module I: Random Variables
Probability Bay’s rule, Distribution function, Discrete random vectors, different distributions, jointly distributed random variables. Order statistics, Distribution of sums, expectations, moments, transform methods mean time to failure, Inequalities and limit theorems, Mixture distribution, Conditional expectations, Imperfect fault coverage & reliability, Random sums.

Module II: Stochastic Processes
Classification Bernoulli process, Poisson process, Renewal processes, available analysis, Random incidence, renewal model of program behavior.

Module III: Markov Chains
n-step transition probabilities, limiting distribution, distribution of times between state changes, irreducible finite chains with a periodic states, the m/g/I, queueing system discrete parameter, Birth Data Processes, Markov chains with absorbing states, Birth and death Processes, Non – Birth Death Processes.

Module IV: Network of Queues
Open and close queuing networks, Non exponential service item distributions and multiple job type, non product form networks. Correlation & Regression: Introduction, least squares curve fitting, Coefficient of determination, Confidence of intervals in linear regression, conluation analysis, non linear regression, Analysis of variance.

Examination Scheme:

<table>
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<th>S/V/Q</th>
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Text & References:
- S.P.Gupta, Statistical Methods, Sultan Chand Sons
ADVANCED CONTROL SYSTEMS

Course Code: MTE 104  
Credit Units: 04

Course Objective:
The course provides comprehensive and insightful knowledge of Digital control systems. Objective of the course is to provide the students the core knowledge of Stability theory of Digital systems and State Variable analysis of Digital System.

Course Contents:

Module I: Introduction
Configuration of the basic Digital Control Systems, types of sampling operations, Sample and Hold operations, Sampling theorem, Basic discrete time signals.

Module II: Stability Methods
Mapping between s-plane and z-plane, stability methods: Modified Routh Criterion, Jury’s method, modified Schur-Cohn criterion.

Module III: Models of Digital Control Systems

Module IV: Control Systems Analysis Using State Variable Methods
State variable representation, conversion of state variable models to transfer function and vice-versa, Eigen values and eigen vectors, Solution of state equations, Concepts of controllability and observability.

Module V: State Variable analysis of Digital Control Systems
State variable description of digital control systems, conversion of state variable models to pulse transfer function and vice versa, solution of state difference equations, controllability and observability.

Examination Scheme:

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</table>

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

Text & References:

- M. Gopal, Digital Control and State Variable Methods, Tata Mc-Graw-Hill.
- B.C Kuo, Digital Control Systems, Prentice Hall.
DIGITAL SIGNAL PROCESSING

Course Code: MTE 105
Credit Units: 04

Course Objective:
Digital Signal Processing gives a brief overview of the evolution of Digital Signal from its parent Analog Signal, its processing in terms of detection, classification, quantization and discrete response to various hardware and software techniques. It also realizes the need of Analog signal construction to various complex mathematical operations on, unit impulse responses in any considerate measuring domain and preparing the synthesized signal for accurate, fast and pre-determinedly programmed digital conversion.

Course Contents:

Module I: Discrete – Time Description of Signals & Systems
Discrete – time sequences, response sequence, time invariant systems, stability and causality criterion for discrete – time systems, linear constant coefficient difference equation, properties of real valued sequences, convolution, correlation.

Module II: The Z – Transform

Module III: The Discrete Fourier Transform (DFT)
Definition, its properties, DFT, IDFT pair, circular convolution, Computations for evaluating the DFT, FFT algorithm, Analytic derivation of the “decimation-intime FFT algorithm”, Some general observation on the FFT.

Module IV: Infinite Impulse Response (IIR) Filter Design Techniques
Introduction, Analog filter system function & frequency response, Analog low pass filter design techniques for Butterworth, Chebyshev Type-I and Type-II filter, Impulse invariance and Bilinear Transformation methods to convert Analog filters into Digital Filters. Transformation for converting low pass filters into other types.

Module V: Finite Impulse Response (FIR) Filter Design Techniques
Digital Filter Structure: The direct from I & II structure, Cascade & parallel combination of IInd order sections.

Examination Scheme:

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Text & References:

LOW POWER VLSI DESIGN LAB

Course Code: MTE 120 Credit Units: 02

Course Contents:

List of Experiments:

1) Layout of CMOS Inverter.
2) Layout of NAND & NOR Gates.
3) Design & Simulation of SR Latch using NAND & NOR Representations.
4) Design & Simulation of D Flip Flop using NAND & NOR Representations.
6) Design & Simulation of T Flip Flop using NAND & NOR Representations.
7) Design & Simulation of Master Slave JK Flip Flop using NAND & NOR Representations.

Examination Scheme:

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Note: IA – Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.
ADVANCED DIGITAL COMMUNICATION SYSTEMS LAB

Course Code: MTE 121
Credit Units: 02

Course Contents:

List of Experiments:

1. To study carrier modulation techniques using Amplitude shift keying and frequency shift keying
2. To study carrier modulation techniques using binary phase shift and differential shift keying.
3. To study data coding and decoding for NRZ format (NRZ L, M&S)
4. To study data coding and decoding for phase encoding format (Biphase L, M&S).
5. To study data coding and decoding for unipolar to bipolar and vice versa (Rz, AMI, URZ)
6. To study slop overload and increased gain in data modulation.
7. To study delta modulation and demodulation with CVSD modulation.
8. To study compander and expander

Examination Scheme:

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Note: IA – Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.
Course Code: MTE 122
Credit Units: 02

Course Contents:

List of Experiments:

1. To design FIR Filter using Hamming window
2. To convert Analog filter into Digital Filter using bilinear transformation
3. To determine z and inverse z transform of a given sequence
4. To verify 7 points FFT algorithm in decimation in time (DIT) & decimation in frequency (DIF).
5. To determine the filter coefficient using Ramaz exchange algorithm
6. To design an IIR digital filter and its parallel realization

Examination Scheme:

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

Course Code: MTE 141  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:

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</table>

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

Examination Scheme:

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Text & References:

- Towers, Marc: Self Esteem, 1st Edition 1997, American Media
- Covey, R. Stephen: Seven habits of Highly Effective People, 1992 Edition, Simon & Schuster Ltd.,
- Dr. Dinkmeyer Don, Dr. Losoney Lewis, The Skills of Encouragement: St. Lucie Press.
Course Code: MTE 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:**

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C – Project + Presentation
I – Interaction/Conversation Practice

**Text & References:**
- le livre à suivre: Campus: Tome 1
GERMAN - I

Course Code: MTE 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 Diphongs

Module IV: Countries, nationalities and their languages
To make the students acquainted with the most widely used country names, their nationalität 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:

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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 – I

Course Code: MTE 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:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras
**JAPANESE - I**

**Course Code:** MTE 147  
**Credit Units:** 02

**Course Objective:**
To enable the students to learn the basic rules of grammar and Japanese language to be used in daily life that will later help them to strengthen their language.

**Course Contents:**

**Module I: Salutations**  
Self introduction, Asking and answering to small general questions

**Module II: Cardinal Numbers**  
Numerals, Expression of time and period, Days, months

**Module III: Tenses**  
Present Tense, Future tense

**Module IV: Prepositions**  
Particles, possession, Forming questions

**Module V: Demonstratives**  
Interrogatives, pronoun and adjectives

**Module VI: Description**  
Common phrases, Adjectives to describe a person

**Module VII: Schedule**  
Time Table, everyday routine etc.

**Module VIII: Outings**  
Going to see a movie, party, friend’s house etc.

**Learning Outcome**
- Students can speak the basic language describing above mentioned topics

**Methods of Private study /Self help**
- Handouts, audio-aids, and self-do assignments and role-plays will support classroom teaching

**Examination Scheme:**

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C – Project + Presentation  
I – Interaction/Conversation Practice

**Text & References:**

**Text:**
- Teach yourself Japanese

**References:**
- Shin Nihongo no kiso 1
Course Code: MTC 148
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 3rd 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:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- “Elementary Chinese Reader Part I” Lesson 1-10
INFORMATION THEORY AND CODING

Course Code: MTE 201 Credit Units: 04

Course Objective:
This course introduces how various coding takes place in communication and what type of different codes are used in communication system. It also introduces different entropies, channel capacity and purpose of encoding.

Course Contents:

Module I: Basic Concepts of Information Theory
A measure of Uncertainty, Binary Sources, Measure of Information for two – dimensional discrete finite probability Scheme, Noise characteristics of channel, Basic relationship among different entropies, Measure of mutual information channel capacity, Capacity of channel with symmetric noise structure BSC and BEC.

Module II: Element of Encoding
Propose of encoding separable binary codes, Shannon Fano encoding, Noiseless coding Theorem of decidability, Mc Millen’s Theorem, Average length of encoding massage, Shannon’s Binary encoding, Fundamental Theorem of discrete Noiseless coding, Huffman’s Minimum Redundancy codes

Coding for Reliable Digital Transmission & Storage
Introduction, types of codes, Modulation and Demodulation, Maximum likelihood decoding, types of error, error control strategies.

Module III: Introduction to Algebra
Groups, Fields Binary field Arithmetic, Construction of Galois field GF (2m), Basic Properties of Galois Field GF (2m), Vector Spaces, Matrices.
Linear Block Codes: Introduction to Linear Block codes, Syndrome and Error detection, Minimum distance of block code, error detecting and Error correcting capability a block code Hamming Code.
Cyclic Codes: Description of Cyclic codes, Generator and parity check matrices of cyclic codes, encoding of cyclic codes syndrome computation & error detection decoding of cyclic codes, Error trapping decoding of cyclic codes, Goley Codes.

Module IV: BCH Codes
Description of codes, Decoding of BCH codes, Implementation of Galois Field Arithmetic, Implementation of error connection,
Convolution Codes: Encoding of convolution codes, structural properties of Convolution codes, distance properties of Convolution codes, Distance Properties of convolution codes, Maximum likelihood decoding of convolution codes.

Automatic Repeat Request Strategies
Stop and wait, Go back and selective repeat ARQ strategies, Hybrid ARQ Schemes.

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Text & References:
- F.M. Reza: Information Theory, McGraw Hill
- ShuLin & J Costeib: Error Control Coding, (PHI)
ADVANCED COMPUTER NETWORKS

Course Code: MTE 202  Credit Units: 04

Course Objective:
This course gives a thorough understanding of the advanced concepts of Computer Network by giving in-depth knowledge of protocol used at various layers of the reference model. It also introduces the students with network topologies and applications of Computer Networks.

Course Contents:

Module I
Introduction to computer Networks, Evolution of Computer networks and its uses, reference models, example networks
The physical layer: Theoretical basis for data communication, Transmission media, wireless transmission. Telecom infrastructure, PSTN, Communication satellites, Mobiles telephone System

Module II: The data link layer
Data link layer design issues, Error detection and correction, data link protocols, sliding window protocols, example of data link protocols – HDLC, PPP Access

Module III: Medium access layer
Channel allocation problem, multiple access protocols, ALOHA, CSMA/CD, IEEE standard 802 for LAN and MAN, Bridges

Module IV: The network layer
Network layer concepts, design issues, static and dynamic routing, algorithm, shortest path routing, flooding, distance vector routing, link state routing, distance vector routing, multicast routing, congestion control algorithm, internetworking, IPv4

Module V: The transport layer
The transport services, elements of transport, TCP and UDP the application layer: Brief introduction to presentation and session layer, DNS, E-mail, WWW

Examination Scheme:

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Text & References:

Text:

References:
- Stallings W., “Computer Communication Networks”, PHI.
- William A. Shay, “Understanding Data Communications & Networks”.
ADVANCED MICROWAVE ENGINEERING

Course Code: MTE 203 Credit Units: 04

Course Objective:
This course provides the comprehensive knowledge of microwave frequencies; construction and characteristic of Transistor, FET at Microwave frequency, Microwave Devices, Concept of MICS, Materials used for fabrication in MICS, different fabrication techniques, concept of Transmission line on MICS. This course also deals with the study of microwave sources, detection diodes and applications of microwave in modern technology.

Course Contents:

Module I
Microwave frequencies, microwave transistor, microwave field effect transistor

Module II

Module III: Microwave Integrated Circuit
Introduction, Circuit Forms, Transmission lines for MICs, Lumped Elements for MICs, Material for MICs: Substrate, Conductor, dielectric and resistive Materials, Fabrication techniques, Typical example of fabrication, Hybrid fabrication.

Module IV: Microwave tubes
Klystron, Reflex Klystron and Magnetron, Traveling wave tubes, microwave detection diodes, application of microwave

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

Text & References:
- Microwave Devices and Circuits by S. Y. Liao, PHI
- Microwave Engineering and application by O.P. Gandhi, Maxwell Macmillan Pub.
- Microelectronic Devices by E. S. Yang, MGH
ADVANCED OPTICAL COMMUNICATION

Course Code: MTE 204  Credit Units: 04

Course Objective:
The objective of this course is to introduce the student to the fundamental basics and understanding of fiber optical communications. This includes the properties of optical fibers and how they are used to establish optical links for communication systems. The course also gives exposure of Advance Optical Communication use in present communications networks.

Introduction:
Concepts of information, general communication systems, evolution of optical fiber communication systems, advantages, disadvantages of optical fiber, communication systems.

Course Contents:

Module I: Wave propagation in dielectric waveguide
snell’s law, internal reflection, dielectric slab wave guide, numerical aperture, propagation of model & rays. step-index fibers, graded index fibers.

Module II: Attenuation in optics fibers
Fiber attenuation, connectors &splices, bending loses, Absorption, scattering, very low loss materials, plastic & polymer-clad-silica fibers.

Module III: Wave propagation in fibers
wave propagation in step index & graded index fiber, fiber dispersion, single mode fibers, multimode fibers, dispersion shifted fiber, dispersion flattened fiber, polarization.

Module IV: Optical sources & detectors
Principles of light emitting diodes (LED’s), design of LED’s for optical fiber communications, semiconductor LASER for optical fiber communication system, principles of semiconductor photodiode detectors, PIN photodiode, Avalanche photodiode detectors.

Module V: Optical fiber communication system
Telecommunication, local distribution series, computer networks local data transmission & telemetry, digital optical fiber communication system, first & second generation system, future system.

Module VI: Advanced multiplexing strategies
Optical TDM, subscriber multiplexing (SCM), WDM
Optical networking: data communication networks, network topologies, MAC protocols, Network Architecture- SONET/SDH, optical transport network, optical access network, optical premise network.

Examination Scheme:

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

Text & References:

- Senior J., optical fiber communications, principles & practice, PHI.
- Keiser G., optical fiber communications, Mcgraw-hill.
- Gowar J., optical communication systems, PHI.
- William B. Jones jr., Introduction to optical fiber communication systems, Holt, Rinehart and Winston, Inc.
ADVANCED COMPUTER NETWORKS LAB

Course Code: MTE 220  Credit Units: 02

Course Contents:

**List of Experiments:**

1. Study of Router Configuration in interface mode. (Cisco 800 & Cisco 1751)
2. Router Configuration with LAN setup by using 1700 Series Router and using belnet modem.
3. Study of CISCO switch 5100 series (12 ports) and setup VLAN
4. Socket Programming with JAVA
5. Network Programming by using JAVA Program.
6. Router Configuration with ISDN Line.
7. To study wide area network through serial ports via DTF & DLE cable.
8. To interconnect different network through routers
9. To study Real (Lease Line Scenario) DCE devices using RAD Modems
10. Recovering ISCO router password.
11. To study ISDN (BRI & PRI)
12. To study accessing of router from different location using> For CCNA, ISDN is required & card is ISDN card Removable)

**Examination Scheme:**

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Note: IA–Internal Assessment, EE- External Exam, PR-Performance, LR – Lab Record, V – Viva.
Course Code: MTE 221

Credit Units: 02

Course Contents:

List of Experiments:

1. Layout & Simulation of CMOS Inverter using CAD Tools.
2. Layout & Simulation of NAND & NOR Gates with Optimal Aspect Ratio.
3. Design & Simulation of SR Latch using NAND & NOR Representations.
6. Design & Simulation of R2R Ladder DAC.
7. Design & Simulation of ADC using DAC.

Examination Scheme:

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

Course Code: MTE 222
Credit Units: 02

Course Contents:

List of Experiments:
1. To study LASER free space Communication.
2. To study losses in optical fiber.
3. To measure the Numerical Aperture of the Fiber.
4. To characterize optical sources.
5. Design and evaluation of LD digital transmission system.
6. To study video transmission through optical fiber link.
7. To study WDM in optical fibers.

Examination Scheme:

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Note: IA – Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.
Course Objective:
This course contents topics related with technologies envolved with modern satellite communication systems. It also gives indeath knowledge about on board equipment use in Satellite Transponder and earth station. Various multiaccess techniques used in Satellite Communication alont with link engineering are also covered.

Course Contents:

Module I: Introduction
Satellite communication, Brief History, Orbits of satellite: Low, medium and geo-synchronous main characteristics, Angle period, Returning period, Angle of Evaluation, Propagation Delay, Orbital spacing.

Module II Satellite Links
Delay transponder, Earth Stations, Antennas and Earth Coverage, Altitude and eclipses.

Module III: Earth space propagation effects
Frequency window, Free space loss, Atmospheric absorption, Rainfall Attenuation, Inospheric scintillatin, Telemetry, Tracking and command of satellites.
Detection: QPSK offset QPSK and MSK, Coherent and non-coherent detection, Error rate performance.

Module IV: Synchronization
Principal and techniques, Multiple Access Techniques, FDMA, SPADE system, TDMA system, Concept and configuration, system timing frames format, SSMA Basu Principles, VSAT, Random Access, space communication, link design descripsion of operational in TELSAT and INSAT system.

Examination Scheme:

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Text & References:

- J. Martin: Communication Satellite System, PH Englewood
- Tri Ha Digital Satellite Communication Tata Mc Graw-Hill
BLUETOOTH TECHNOLOGY

Course Code: MTE 206  
Credit Units: 04

Course Objective:
This subject provides Introduction to various wireless technologies with special emphasis on Bluetooth networking and Implementation.

Course Contents:

Module I: Introduction to wireless technologies
WAP services, Serial and Parallel Communication, Asynchronous and synchronous Communication, FDM, TDM, TFM, Spread spectrum Technology

Module II: Introduction to Bluetooth
Specification, Core protocols, Cable replacement protocol Bluetooth Radio: Type of Antenna, Antenna Parameters, Frequency hoping

Module III: Bluetooth Networking
Wireless networking, wireless network types, devices roles and states, adhoc network, scatternet Connection establishment procedure, notable aspects of connection establishment, Mode of connection, Bluetooth security, Security architecture, Security level of services,

Module IV: Profile and usage model
Generic access profile (GAP), SDA, Serial port profile, Secondary bluetooth profile.

Module V: Hardware

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Text & References:
- Bluetooth Technology by C.S.R. Prabhu and A.P. Reddi; PHI
Course Code: MTE 207 Credit Units: 04

Course Objective:
The basic objective of Cluster and Grid Computing is to provide introduction to Cluster Computing with special and details emphassion grid technologies and Applications execution.

Course Contents:

Module I: Cluster Computing
Introduction, Parallel systems, Cluster Architecture, Parallel Paradigms.

Module II: Programming
Parallel Programming with MPI, Resource management and scheduling.

Module III: Grid Computing
Introduction, Grids and Grid Technologies, Programming models and Parallelization Techniques, Standard application development tools and paradigms such as message-passing and parameter parallel programming, Grid Security Infrastructure, Data Management.

Module IV: Application Case Study
Molecular Modeling for Drug Design and Brain Activity, Analysis, Resource management and scheduling, Setting up Grid, deployment of Grid, software and tools, and application execution.

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Text & References:

REAL TIME SYSTEMS AND SOFTWARE

Course Code: MTE 208  Credit Units: 04

Course Objective:
The basic objective of Real Time System and Software Engineering is to study different real time systems their application in time constraints software that can scale up for large systems and that can be used to consistently produce high-quality software at low cost and accurate time limit.

Course Contents:

Module I: Introduction

Module II: Requirements and Design Specifications

Module III: Declarative Specifications
Regular Expressions and Extensions, Traditional Logics- Propositional Logic, Predicates, Temporal logic, Real time Logic Deterministic Scheduling: Assumptions and Candidate Algorithms, Basic RM and EDF Results.

Module IV

Module V: Programming Languages
Real Time Language Features, Ada-Core Language, Annex Mechanism for Real Time Programming, Ada and Software Fault Tolerance, Java and Real-time Extensions, CSP and Occam

Examination Scheme:

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Text & References:

- Real – Time Systems and software by Alan C. Shaw; John Wiley & Sons Inc
MEMS AND IC INTEGRATION

Course Code: MTE 209  Credit Units: 04

Course Objective:
This course gives the exposure of various techniques used in MEMS and IC Integration. RF and Optical MEMS are also covered.

Course Contents:

Module I
Overview of CMOS process in IC fabrication, MEMS system-level design methodology.

Module II
Equivalent Circuit representation of MEMS, signal-conditioning circuits, and sensor, noise calculation.

Module III
Pressure sensors with embedded electronics (Analog/Mixed signal): Accelerometer with transducer, Gyroscope, RF MEMS switch with electronics, Bolo meter design

Module IV
RF MEMS, and Optical MEMS MECS, thermo actuator MOEMS CILV, Digital Micro mirror device Laser light.

Examination Scheme:

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Text & References:

- Ljubisa Ristic, Editor, Sensor Technology and Devices, Artech House, 1994
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:

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</table>

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
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

Examination Scheme:

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Text & References:

- Julia T. Wood, Interpersonal Communication everyday encounter
- Harvard Business School, Effective Communication: United States of America
- Beebe, Beebe and Redmond; Interpersonal Communication, 1996; Allyn and Bacon Publishers.
FRENCH - II

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:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1
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 propositions with their use
Both theoretical and figurative use

Module VIII: Dialogues
Dialogue reading: ‘In the market place’
‘At the Hotel’

Examination Scheme:

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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, Schmö, Deutsch als Fremdsprache 1A, Grundkurs
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 (e.g., 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:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras
Course Code: MTE 247  Credit Units: 02

Course Objective:
To enable the students to converse in the language with the help of basic particles and be able to define the situations and people using different adjectives.

Course Contents:

Module I: Verbs
Transitive verbs, intransitive verbs

Module II: More prepositions
More particles, articles and likes and dislikes.

Module III: Terms used for instructions
No parking, no smoking etc.

Module IV: Adverbs
Different adverbial expression.

Module V: Invitations and celebrations
Giving and receiving presents,
Inviting somebody for lunch, dinner, movie and how to accept and refuse in different ways

Module VI: Comprehension’s
Short essay on Family, Friend etc.

Module VII: Conversations
Situational conversations like asking the way, At a post office, family

Module VIII: Illness
Going to the doctor, hospital etc.

Learning Outcome
➢ Students can speak the language describing above-mentioned topics.

Methods of Private study /Self help
➢ Handouts, audio-aids, and self-do assignments.
➢ Use of library, visiting and watching movies in Japan and culture center every Friday at 6pm.

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

Text:
• Teach yourself Japanese

References:
• Shin Nihongo no kiso 1
CHINESE– II

Course Code: MTC 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 much it 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.
Moming, Afternoon, Evening, Night.

Module III
Use of words of location like-li, wais 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:

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<tr>
<th>Components</th>
<th>CT1</th>
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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

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

Course Code: MTE 301 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: Transducers:
Classification of Transducers including analog and digital transducers, Selection of Transducers, Static and Dynamic response of transducer System.

Module II

Module III: Telemetry
Basic Principles, Proximity & remote Action Telemetry systems, Multiplexing; Time Division and frequency division.

Module IV: Various types of Display Device

Module V
Fibre Optic Technology for data transmission, Supervisory Control and Data Acquisition Systems (SCADA), Q-meter. Electrical noise in control signals, its remedial measures.

Examination Scheme:

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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.
- Electrical Transducers for Industrial Measurement by pH Mansfield.
- Instrumentation systems by Mani Sharma, Rangan.
- Principles & Methods of Telemetry by Borden & Thgnel.
- Telemetry Method by Foster.
NANO SCIENCE AND TECHNOLOGY

Course Code: MTE 302  Credit Units: 04

Course Objective:
Introduction to nanoscience and nanotechnology includes concept of quantum electronics, nanoscale fabrication technology, nanomaterials, i.e CNT and fullerenes.

Course Contents:

Module I: Introduction to Nanoscale Science
Concept of quantum electronics, Molecules as building blocks of nanomaterials, band energy etc.

Module II: Introduction to Nanoscale Technology
Nanoscale fabrication techniques, Molecular self-assembly, wet chemical synthesis, top down and bottom up approaches

Module III: Nanostructured Materials
Buckballs, Nanoparticle preparation in emulsion and microemulsion, Nanostructures and nanoparticles in thin organic films, Amphiphiles and surfactants.

Module IV: Applications of Nanomaterials
Details of nanostructured materials, applications in Sensors, clothes, paints, health care, electronics, computers, and other industrial and consumer products.

Module V: Fullereness and Carbon Nanotubes
Importance, properties and application of CNT and Fullerenes.

Examination Scheme:

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</tbody>
</table>

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

Text & References:

- Introduction to nanotechnology, Charles P Poole, Jr. and Franks J Qwens
- Synthesis, Functionlization and surface treatment of Nanoparticle, Marie Isabella Buraton
- The Chemistry of Nanomaterials, CNR Rao, A K Cheethan
- Surface and Interface, M C Rastogi
ADVANCED IMAGE PROCESSING

Course Code: MTE 303 Credit Units: 04

Course Objective:
Processing color and grayscale images or other two-dimensional signals has become an important tool for research and investigation in many areas of science and engineering. Advance Image Processing is designed to give professionals and students a powerful collection of fundamental and advanced image processing tools on the desktop. Advance Image Processing takes full advantage of the computational technology of Mathematica.

Course Contents:

Module I: Introduction and Digital Image Fundamentals
Human visual system and image perception, monochrome & color vision models, color representation; image sampling & quantization; 2-D systems; image transforms; image coding, stochastic models for image representation, some basic relationships like neighbours, connectivity, Distance measure between pixels, Imaging Geometry.

Histogram: Definition, decision of contrast basing on histogram, operations basing on histograms like image stretching, image sliding, Image classification. Definition and Algorithm of Histogram equalization.

Module II: Image enhancement, restoration & reconstruction

Image Transforms: Discrete Fourier Transform, Some properties of the two-dimensional fourier transform, Fast Fourier transform, Inverse FFT, Walsh, Hadamard, Discrete cosine, Haar, Slant, KL Transforms

Image Enhancement: SPATIAL Domain Methods: Arithmetic and logical operations, pixel or point operations, size operations, Smoothing filters-Mean, Median, Mode filters, Comparative study, Edge enhancement filters – Directorial filters, Sobel, Laplacian, Robert, KIRSCH Homogeneity & DIFF Filters, prewitt filter, Contrast Based edge enhancement techniques, Colour image processing.


Module III: Image analysis using multiresolution techniques

Image Segmentation: Definition, characteristics of segmentation. Detection of Discontinuities, Thresholding, Pixel based segmentation method. Region based segmentation methods – segmentation by pixel aggregation, segmentation by sub region aggregation, histogram based segmentation, split and merge technique. Use of motion in segmentation (spatial domain technique only), Threshold detection methods, edge based image segmentation

Morphology: Dilation, Erosion, Opening, closing, Hit-and-Miss transform, Boundary extraction, Region filling, connected components, thinning, Thickening, skeletons, Morphological segmentation -particles segmentation and watersheds, particles segmentation.

Module IV: Wavelet Transform for Image Processing
Harr wavelets, Daubechies wavelets, Frequency analysis, Wavelet packet transforms, Continuous wavelet transforms, multi-resolution analysis, Image Restoration using Multiresolution Texture Synthesis

Module V: Image Compression

Representation and Description: Representation schemes like chain coding, Polygonal Approximation, Signatures, Boundary Segments, Skeleton of region, Boundary description, Regional descriptors, Morphology.

Recognition and Interpretation: Elements of Image Analysis, Pattern and Pattern Classes, Decision-Theoretic Methods, Structural Methods, Interpretation.

Examination Scheme:

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</table>

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Text & References:


References:
• Rosefield Kak, “Digital Picture Processing”,
• Fundamentals of Electronic Image Processing by Arthyr - R – Weeks, Jr. (PHI)
• Image processing, Analysis, and Machine vision by Milan Sonka vaclan Halavac Roger Boyle, Vikas Publishing House.
Course Objective:
This course deals with the systematic study of the Architecture and programming issues of microprocessor family and its applications. The aim of this course is to give the students detailed knowledge of the above microprocessor needed to develop the systems using it.

Course Contents:

Module I: Microprocessor
Intel 8085 - Introduction, register structure, memory Addressing, Addressing Modes, Instruction Set, Timing Methods, CPU Pins and Associated Signals, Instruction timing and execution. programming I/O. Interrupt System, DMA, SID & SOD lines, Instruction set, 8085 based system design.

Module II: Intel 8086
Introduction, Architecture, Addressing modes, instruction set, memory management, assembler dependent instructions, Input/Output, system design using 8086.

Module III: Pentium Processors

Module IV: Peripheral Interfacing
Parallel versus serial transmission, synchronous and asynchronous serial data transmission. Interfacing or hexadecimal keyboard and display unit, interfacing of cassette recorders and parallel, serial interface standards. Study of Peripheral Devices 8255, 8253, 8257, 8251, 8259.

Module V: Microprocessor applications to Power Engineering
Protective Relaying: over-current, impedance, MHO, reactance, bi-directional relays.

Examination Scheme:

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Text & References:

ADVANCED INSTRUMENTATION LAB

Course Code: MTE 320  Credit Units: 01

Course Contents:

List of Experiments:

1. Measurement of thickness & resolution of LVDI (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:

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

Course Code: MTE 321  Credit Units: 01

Course Contents:

List of Experiments:

1. Simulate all programs using MATLAB
2. To study about the basic image processing tools.
3. Write program for histogram processing.
4. Write program for filtering in frequency domain.
5. Write program for filtering in spatial domain.
6. Write programs for different compression schemes.
7. Write program image restoration.
8. Write program for performing different morphological operations.
9. Write program for image segmentation.

Examination Scheme:

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Note: IA – Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.
Course Code: MTE 322  Credit Units: 01

Course Contents:

List of Experiments:

1. To load the numbers 49H and 53H ion memory location 9510 & 9511.
2. Respectively and add the contents of memory location 9601.
3. To write the Assembly Language Programming for 8 bit addition with and without carry.
4. To write the Assembly Language Programming for 8 bit subtraction with and without borrow.
5. To write the Assembly Language Programming for 8 bit Multiplication and Division.
6. To write the Assembly Language Programming for sorting an array of numbers in Ascending & Decending order.
7. To write the Assembly Language Programming with Additional Instructions.
8. To write and execute a program using Stacks.
9. To study and program the programmable Peripheral interface (8255 board).
10. To study and program the programmable interval timer (8253 board).
11. To study and program the programmable DMA Controller (8257 board).
12. To study and program the programmable Interrupt Controller (8259 board).
13. To study of programmable Serial Communication interface (8251 board).

Examination Scheme:

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Note: IA – Internal Assessment, EE – External Exam, PR – Performance, LR – Lab Record, V – Viva.
Course Code: MTE 305  Credit Units: 04

Course Objective:
The objective of this subject is to make students familiar about the basic concepts mobile technology, computing and market

Course Contents:

Module I: Introduction
Wireless Networks, Wireless VS Wired Networks, Mobile Devices, Mobile Applications, Challenges in mobile computing, coping with uncertainties, resource poorness, bandwidth, etc. Cellular architecture, co-channel interference, frequency reuse, capacity increase by cell splitting, GSM Architecture, GSM-Air Interface, protocols, localization & calling.

Third Generation (3G) Mobile Services: Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G.


Module II: (Wireless) Medium Access Control
Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

Mobile Network Layer: Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission time-out freezing, Selective retransmission, Transaction oriented TCP.

Module III: Database Issues
Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and transactional models, query processing, recovery, and quality of service issues.

Data Dissemination: Communications asymmetry, classification of new data delivery mechanisms, push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

Context Aware Computing: Ubiquitous computing, concept of context, context aware computing and applications, middleware support.

Module IV: Mobile Data Communication
WLANs (Wireless LANs) IEEE 802.11 standard, Mobile IP.

Wireless Application Protocol (WAP): The Mobile Internet standard, WAP Gateway and Protocols, wireless mark up Languages (WML).

Wireless Local Loop (WLL): Introduction to WLL Architecture, wireless Local Loop Technologies.

Module V: Global Mobile Satellite Systems
Mobile Satellite Systems (GEO, MEO and LEO), case studies of the IRIDIUM and GLOBALSTAR systems. GPS.

Wireless Enterprise Networks: Introduction to Virtual Networks, Blue tooth technology, Blue tooth Protocols.


Examination Scheme:

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Text & References:

Text:
References:

OPTIMIZATION TECHNIQUES

Course Code: MTE 306 Credit Units: 04

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 inequality 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:

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Text & References:

- G.V. Reklaitis, Engg. optimization Methods & applications, Wiley.
ADVANCED POWER ELECTRONICS

Course Code: MTE 307 Credit Units: 04

Course Objective:
The course aims to introduce them to the theory of operation, analytical, circuit models and basic design concepts of Electric Power components and system.

Course Contents:

Module I: Power Semiconductor Diodes

Module II: Thyristor
V-I Characteristics, Turn ON & Turn OFF Characteristics, di/dt and dv/dt protection, Series and Parallel Operation of Thyristors, Thyristor firing circuits, UJT and PUJT, Thyristor commutation Techniques.

Module III: Power Transistors
Bipolar Junction Transistors, their steady State & Switching Characteristics, Power MOSFET's and their steady state & switching characteristics, Gate drive SIT’s & IGBT's, Series & Parallel Operation, di/dt and dv/dt limitations.

Module IV: Controlled Rectifiers
Single Phase & Three Phase full Converters with R-L load, Single phase &: three phase dual converters, Power factor improvement technique.

Module V: A.C. Voltage Controllers
Principle of phase control, Single phase and three phase full controllers, Cycloconvertor, A.C. voltage Controllers with PWM Control, Effects of source & Load Inductances.

Module VI: D.C Choppers
Chopper Classification, Thyristor Chopper Circuits, Chopper Circuit Design.

Module VII: PWM Inverters
Principle of Operation, Performance parameters, single phase bridge invertors and their voltage Control, Harmonic Reduction, Inverter Circuit Design.

Examination Scheme:

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Text & References:

- M.H. Rashid, Power Electronics Circuits Devices application, PHI.1994
Course Objective:
This course builds basic knowledge of different types of Radar systems along with link designing & application. It also covers different modulation schemes & channels used.

Course Contents:

Module I: Introduction & basic working principle of radar
Basic radar, radar equation, its block diagram, frequencies, applications and origins
Different radar systems MTI and pulse Doppler radar, tracking radar delay line cancellers, staggered pulse repetition frequencies Doppler filler banks digital MTI processing AMTI, tracking with radar, mono-pulse tracking limitation of tracking ADT.

Module II: Detection of signals in noise
Receiver noise and S/N ratio, probability density function probabilities of detection and false alarm, integrating radar pulses, radar cross section of targets, cross section fluctuations, PRF matched filter receiver, detectors, automatic detection, integrators, constant, pulse alarm rate receivers, radar operators, signal management

Module III: Radar signal processing & clutter
Basic radar measurement accuracy & radar measurement ambiguity diagram, pulse compression, target recognition. Introduction to radar clutter, surface clutter radar equation, land clutter, sea clutter, statistical models for surface clutter, weather clutter, non spherical clutter, detection of targets in clutter.

Module IV: Radar transmitter & receivers
Aspects of radar transmitters & receivers, linear beam power tubes solid state RF power sources. Receiver noise figure, super heterodyne receiver duplexers and receiver protectors, radar displays.

Examination Scheme:

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</table>

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Text & References:
- Introduction to Radar System – M. I. Skolnik
- Radar Fundamentals – G.J Wheeler
- Radar Engineering – D. G. Rink
Course Objective:
The primary objective of this presentation is to share the experience gained in improving reliability and
maintainability (R&M) features of the Advances Light Helicopter (ALH), designed and developed by the
Hindustan Aeronautics Limited, Bangalore, India. The presentation briefly describes the advance technology
features adopted and their impact on R&M and outlines the reliability management aspects adopted during
prototype development and production phases. The specific R&M features incorporated in design are elaborated.
The failure reporting, analysis and corrective action system (FRACAS) established for R&M analysis is
described and efforts made to improve R&M are illustrated with examples of held service data obtained from
customers on initial production batches. The ALH experience reinforces the need for a well – established
FRACAS and a system for customer interaction to improve product R&M.

Course Contents:

Module I: Reliability Mathematics
Random experiments, probability, random variables, distribution functions, discrete distributions, Continuous
distributions.

Module II: Network Modelling and reliability evaluation of simple systems
Series systems, parallel system, series-parallel systems, partially redundant systems, standby redundant systems.

Module III: Networks and reliability evaluation of complex systems

Module IV: Probability distributions in reliability Evaluation
General reliability function, Poisson distribution, normal distribution, exponential distribution.

Module V: Discrete Markov Chains
General modelling Concept, Stochastic transitional prob. matrix, Time dependent prob. evaluation, Limiting
state Prob. evaluation, Absorbing States.

Module VI: Continuous Markov Processes
General modeling concepts, state space diagrams, Stochastic transitional probability matrix, Evaluating limiting
state probabilities.

Examination Scheme:

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Text & References:

  Press, N.Y. and London.
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, Emails; 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:

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</table>

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Krishnaswamy, N, Creative English for Communication, Macmillan
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

Examination Scheme:

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</table>

Text & References:

- Organizational Behaviour, Davis, K.
- LaFasto and Larson: When Teams Work Best, 2001, Response Books (Sage), New Delhi
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:

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<tr>
<th>Components</th>
<th>CT1</th>
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C – Project + Presentation
I – Interaction/Conversation Practice

• le livre à suivre: Campus: Tome 1
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:

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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:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

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

Course Code: MTE 347 Credit Units: 02

Course Objective:
To enable the students to converse in the language with the help of basic verbs and to express themselves effectively and narrate their everyday short encounters. Students are also given projects on Japan and Japanese culture to widen their horizon further.
Note: The Japanese script is introduced in this semester.

Course Contents:

Module I: Verbs
Different forms of verbs: present continuos verbs etc

Module II
More Adverbs and adverbial expressions

Module III: Counters
Learning to count different shaped objects

Module IV: Tenses
Past tense, Past continuous tense.

Module V: Comparison
Comparative and Superlative degree

Module VI: Wishes and desires
Expressing desire to buy, hold, possess. Usage in negative sentences as well. Comparative degree, Superlative degree.

Module VII: Appointment
Over phone, formal and informal etc.

Learning Outcome
➢ Students can speak the language and can describe themselves and situations effectively
➢ They also gain great knowledge in terms of Japanese lifestyle and culture, which help them at the time of placements.

Methods of Private study /Self help
➢ Handouts, audio-aids, and self-do assignments.
➢ Use of library, visiting and watching movies in Japan and culture center every Friday at 6pm.

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

Text:
➢ Teach yourself Japanese

References:
➢ Shin Nihongo no kiso 1
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, nambian, 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:**

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C – Project + Presentation  
I – Interaction/Conversation Practice

**Text & References:**

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

Course Code: MTE 360  Credit Units: 02

The student will submit a synopsis at the beginning of the semester for the approval to the school project committee in a specified format. The student will have to present the progress of the work through seminars and progress report. A report must be submitted to the school for evaluation purpose at the end of the semester in a specified format.

Examination Scheme:

<table>
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<tr>
<th>Component</th>
<th>Marks</th>
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<tr>
<td>Written Report</td>
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<td>Viva</td>
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<td>Presentation</td>
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<td><strong>Total</strong></td>
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GUIDELINES FOR PROJECT FILE AND PROJECT REPORT

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation. Research is genuine exploration of the unknown that leads to new knowledge which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critically analyzed by the faculty guide and corrected by the student at each stage.

PROJECT FILE

The Project File may be a very useful tool for undertaking an assignment along with a normal semester, an exploratory study, sponsored projects, a project undertaken during summer period or any other period where the researcher is not working with a company/organization. The project/assignment may also be a part of the bigger research agenda being pursued by a faculty/institution/department. The Project File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation. This file may be considered in continuous assessment.

In general, the File should be comprehensive and include:
A short account of the activities that were undertaken as part of the project;
A statement about the extent to which the project has achieved its stated objectives;
A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
Any problems that have arisen and may be useful to document for future reference.

PROJECT REPORT

The Project Report is the final research report that the student prepares on the project assigned to him. In case of sponsored project the lay out of the project could be as prescribed by the sponsoring organization. However, in other cases the following components should be included in the project report:

Title or Cover Page
The title page should contain Project Title; Student’s Name; Programme; Year and Semester and Name of the Faculty Guide.

Acknowledgement(s)
Acknowledgment to any advisory or financial assistance received in the course of work may be given. It is incomplete without student’s signature.

Abstract
A good "Abstract" should be straight to the point; not too descriptive but fully informative. First paragraph should state what was accomplished with regard to the objectives. The abstract does not have to be an entire summary of the project, but rather a concise summary of the scope and results of the project. It should not exceed more than 1000 words.

Table of Contents
Titles and subtitles are to correspond exactly with those in the text.

Introduction
Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

Materials and Methods
This section should aim at experimental designs, materials used (wherever applicable). Methodology should be mentioned in details including modifications undertaken, if any. It includes organization site(s), sample, instruments used with its validation, procedures followed and precautions.

Results and Discussion
Present results, discuss and compare these with those from other workers, etc. In writing this section, emphasis should be laid on what has been performed and achieved in the course of the work, rather than discuss in detail what is readily available in textbooks. Avoid abrupt changes in contents from section to section and maintain a lucid flow throughout the thesis. An opening and closing paragraph in every chapter could be included to aid in smooth flow.

Note that in writing the various sections, all figures and tables should as far as possible be next to the associated text, in the same orientation as the main text, numbered, and given appropriate titles or captions. All major equations should also be numbered and unless it is really necessary, do not write in “point” form.

While presenting the results, write at length about the various statistical tools used in the data interpretation. The result interpretation should be simple but full of data and statistical analysis. This data interpretation should be in congruence with the written objectives and the inferences should be drawn on data and not on impression. Avoid writing straightforward conclusion rather, it should lead to generalization of data on the chosen sample.

Results and its discussion should be supporting/contradicting with the previous research work in the given area. Usually one should not use more than two researches in either case of supporting or contradicting the present case of research.

**Conclusion(s) & Recommendations**

A conclusion should be the final section in which the outcome of the work is mentioned briefly. Check that your work answers the following questions:

- Did the research project meet its aims (check back to introduction for stated aims)?
- What are the main findings of the research?
- Are there any recommendations?
- Do you have any conclusion on the research process itself?

**Implications for Future Research**

This should bring out further prospects for the study either thrown open by the present work or with the purpose of making it more comprehensive.

**Appendices**

The Appendices contain material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

**References**

References should include papers, books etc. referred to in the body of the report. These should be written in the alphabetical order of the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

**Examples**

**For research article**


**For book**


**The Layout Guidelines for the Project File & Project Report**

- A4 size Paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top and bottom margins: 1 inch/2.5 cm; left and right margins: 1.25 inches/3 cm

**ASSESSMENT OF THE PROJECT FILE AND THE PROJECT REPORT**

Essentially, the assessment will be based on the quality of the report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project. Project execution is concerned with assessing how much work has been put in.

The Project should fulfill the following assessment objectives

- Range of Research Methods used to obtain information
- Execution of Research
- Data Analysis (Analyze Quantitative/Qualitative information)
Assessment Scheme:

**Continuous Evaluation:** 40% (Based on punctuality, regularity of work, adherence to plan and methodology, refinements/ mid-course corrections etc. as reflected in the Project File.)

**Final Evaluation:** 60% (Based on the Documentation in the file, Final report layout, analysis and results, achievement of objectives, presentation/ viva)
The aim of the dissertation is to provide you with an opportunity to further your intellectual and personal development in your chosen field by undertaking a significant practical unit of activity, having an educational value at a level commensurate with the award of your degree.

The dissertation can be defined as a scholarly inquiry into a problem or issues, involving a systematic approach to gathering and analysis of information/data, leading to production of a structured report.

Selecting the Dissertation Topic
It is usual to give you some discretion in the choice of topic for the dissertation and the approach to be adopted. You will need to ensure that your dissertation is related to your field of specialization.

Deciding this is often the most difficult part of the dissertation process, and perhaps, you have been thinking of a topic for some time.

It is important to distinguish here between ‘dissertation topic’ and ‘dissertation title’. The topic is the specific area that you wish to investigate. The title may not be decided until the dissertation has been written so as to reflect its content properly.

Few restrictions are placed on the choice of the topic. Normally we would expect it to be:

- relevant to business, defined broadly;
- related to one or more of the subjects or areas of study within the core program and specialisation stream;
- clearly focused so as to facilitate an in-depth approach, subject to the availability of adequate sources of information and to your own knowledge;
- of value and interest to you and your personal and professional development.

Planning the Dissertation
This will entail following:

- Selecting a topic for investigation.
- Establishing the precise focus of your study by deciding on the aims and objectives of the dissertation, or formulating questions to be investigated. Consider very carefully what is worth investigating and its feasibility.
- Drawing up initial dissertation outlines considering the aims and objectives of the dissertation. Workout various stages of dissertation
- Devising a timetable to ensure that all stages of dissertation are completed in time. The timetable should include writing of the dissertation and regular meetings with your dissertation guide.

The Dissertation plan or outline
It is recommended that you should have a dissertation plan to guide you right from the outset. Essentially, the dissertation plan is an outline of what you intend to do, chapter wise and therefore should reflect the aims and objectives of your dissertation.

There are several reasons for having a dissertation plan

- It provides a focus to your thoughts.
- It provides your faculty-guide with an opportunity, at an early stage of your work, to make constructive comments and help guide the direction of your research.
- The writing of a plan is the first formal stage of the writing process, and therefore helps build up your confidence.
- In many ways, the plan encourages you to come to terms with the reading, thinking and writing in a systematic and integrated way, with plenty of time left for changes.
- Finally, the dissertation plan generally provides a revision point in the development of your dissertation report in order to allow appropriate changes in the scope and even direction of your work as it progresses.
**Keeping records**
This includes the following:

- Making a note of everything you read; including those discarded.
- Ensuring that when recording sources, author’s name and initials, date of publication, title, place of publication and publisher are included. (You may consider starting a card index or database from the outset).
- Making an accurate note of all quotations at the time you read them.
- Make clear what is a direct a direct quotation and what is your paraphrase.

**Dissertation format**
All students must follow the following rules in submitting their dissertation.

- Front page should provide title, author, Name of degree/diploma and the date of submission.
- Second page should be the table of contents giving page references for each chapter and section.
- The next page should be the table of appendices, graphs and tables giving titles and page references.
- Next to follow should be a synopsis or abstract of the dissertation (approximately 500 words)
- Next is the ‘acknowledgements’.
- Chapter I should be a general introduction, giving the background to the dissertation, the objectives of the dissertation, the rationale for the dissertation, the plan, methodological issues and problems. The limitations of the dissertation should also be hinted in this chapter.
- Other chapters will constitute the body of the dissertation. The number of chapters and their sequence will usually vary depending on, among others, on a critical review of the previous relevant work relating to your major findings, a discussion of their implications, and conclusions, possibly with a suggestion of the direction of future research on the area.
- After this concluding chapter, you should give a list of all the references you have used. These should be cross-references with your text. For articles from journals, the following details are required e.g.


  For books, the following details are required:

- Finally, you should give any appendices. These should only include relevant statistical data or material that cannot be fitted into the above categories.

**The Layout Guidelines for the Dissertation**

- A4 size Paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top and bottom margins: 1 inch/ 2.5 cm; left and right margins: 1.25 inches/ 3 cm

**Guidelines for the assessment of the Dissertation**
While evaluating the dissertation, faculty guide will consider the following aspects:

1. Has the student made a clear statement of the objective or objective(s).
2. If there is more than one objective, do these constitute parts of a whole?
3. Has the student developed an appropriate analytical framework for addressing the problem at hand.
4. Is this based on up-to-date developments in the topic area?
5. Has the student collected information / data suitable to the frameworks?
6. Are the techniques employed by the student to analyse the data / information appropriate and relevant?
7. Has the student succeeded in drawing conclusion form the analysis?
8. Do the conclusions relate well to the objectives of the project?
9. Has the student been regular in his work?
10. Layout of the written report.

**Assessment Scheme:**

**Continuous Evaluation:**
(Based on Abstract, Regularity, Adherence to initial plan, Records etc.) 40%

**Final Evaluation:** Based on, Contents & Layout of the Report, 60%
Conceptual Framework: 05
Objectives & Methodology and: 05
Implications & Conclusions: 10
Viva & Presentation: 20