Bachelor of Technology (Civil Engineering)

Programme Code: BTV

Duration – 4 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:

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<th>Components</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

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**TERM PAPER DURING SUMMER BREAK**
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**Note:** The following courses have been deferred to summer months (May-June 2010) for 2009 Batch.

*Geo Informatics (BTV404)
*Functional Design of Buildings (BTV405)

### IN-HOUSE PRACTICAL TRAINING DURING SUMMER BREAK

### FIFTH SEMESTER

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**SIXTH SEMESTER**

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**SUMMER TRAINING (6- 8 WEEKS)**

**SEVENTH SEMESTER**

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Curriculum & Scheme of Examination

APPLIED MATHEMATICS - I

Course Code: BTV 101       Credit Units: 04

Course Objective:
The knowledge of Mathematics is necessary for a better understanding of almost all the Engineering and Science subjects. Here our intention is to make the students acquainted with the concept of basic topics from Mathematics, which they need to pursue their Engineering degree in different disciplines.

Course Contents:

Module I: Differential Calculus
Successive differentiation, Leibnitz’s theorem (without proof), Mean value theorem, Taylor’s theorem (proof), Remainder terms, Asymptote & Curvature, Partial derivatives, Chain rule, Differentiation of Implicit functions, Exact differentials, Tangents & Normals, Maxima, Approximations, Differentiation under integral sign, Jacobians & transformations of coordinates.

Module II: Integral Calculus
Fundamental theorems, Reduction formulae, Properties of definite integrals, Applications to length, area, volume, surface of revolution, improper integrals, Multiple Integrals - Double integrals, Applications to areas, volumes.

Module III: Ordinary Differential Equations
Formation of ODEs, Definition of order, degree & solutions, ODE of first order: Method of separation of variables, homogeneous & non homogeneous equations, Exactness & integrating factors, Linear equations & Bernoulli equations, General linear ODE of n\textsuperscript{th} order, Solution of homogeneous equations, Operator method, Method of undetermined coefficients, Solution of simple simultaneous ODE.

Module IV: Vector Calculus
Scalar & Vector Field, Derivative of a Vector, Gradient, Directional Derivative, Divergence and Curl and their Physical Significance, Arc Length, Tangent, Directional Derivative, Evaluation of Line Integral, Green’s Theorem in Plane (without proof), Representation of Surfaces, Tangent Plane and Surface Normal, Surface Integral, Stoke’s Theorem (without proof), Gauss Divergence Theorem (without proof).

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:

Text:
- Differential Calculus by Shanti Narain
- Integral Calculus by Shanti Narain

References:
- Differential Equation by A.R. Forsyth
- Higher Engineering Mathematics by H.K. Dass
APPLIED PHYSICS - I - FIELDS AND WAVES

Course Code: BTV 102 Credit Units: 03

Course Objective:
Aim of this course is to introduce the students to fundamentals of graduate level physics, which form the basis of all applied science & engineering

Course Contents:

Module I: Oscillations & Waves
Ultrasonics: Generation & application of ultrasonic waves.

Module II: Wave Nature of Light
Interference: Coherent Sources, Conditions of interference, Interference due to division of wavefront, Fresnel's biprism. Interference due to division of amplitude, Newton's rings, Interference due to thin films.
Diffraction: Fresnel & Fraunhofer diffraction, Fraunhofer diffraction at a single slit, double slit, N Slits, Transmission grating, Rayleigh criterion & Resolving power of grating.

Module III: Electromagnetics

Examination Scheme:

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Text & References:
- Waves & oscillation, A. P. French
- Physics of waves, W. C. Elmore & M. A. Heald
- Introduction to Electrodynamics, D. J. Griffith
- Electrodynamics, Gupta, Kumar & Singh
- Optics, A. K. Ghatak
- Engineering Physics, Satya Prakash
Course Code: BTV 103  
Credit Units: 03

Course Objective:
Four basic sciences, Physics, Chemistry, Mathematics & Biology are the building blocks in engineering & technology. Chemistry is essential to develop analytical capabilities of students, so that they can characterize, transform & use materials in engineering & apply knowledge in their field. All engineering fields have unique bonds with chemistry whether it is Aerospace, Mechanical, Environmental & other fields the makeup of substances is always a key factor, which must be known. For electronics & computer science engineering, apart from the material, computer modeling & simulation knowledge can be inherited from the molecule designing. The upcoming field of technology like Nanotechnology & Biotechnology depends fully on the knowledge of basic chemistry. With this versatile need in view, course has been designed in such a way so that the student should get an overview of the whole subject.

Course Contents:

Module I: Water Technology
Introduction & specifications of water,
Hardness & its determination (EDTA method only),
Alkalinity,
Boiler feed water, boiler problems – scale, sludge, priming & foaming: causes & prevention, Boiler problems – caustic embrittlement & corrosion: causes & prevention,
Carbonate & phosphate conditioning, colloidal conditioning & calgon treatment

Module II: Fuels
Classification, calorific value of fuel, (gross & net),
Determination of calorific value of fuels, bomb calorimeter,
Solid fuels - Proximate & ultimate analysis,
Octane & Cetane No. & its significance
Numericals on combustion

Module III: Instrumental Methods of analysis
Introduction; Principles of spectroscopy; Laws of absorbance
IR: Principle, Instrumentation, Application
UV: Principle, Instrumentation, Application
NMR: Principle, Instrumentation, Application

Module IV: Lubricants
Introduction; Mechanism of Lubrication;
Types of Lubricants; Chemical structure related to Lubrication;
Properties of lubricants; Viscosity & Viscosity Index; Iodine Value; Aniline Point; Emulsion number; Flash Point; Fire Point; Drop Point; Cloud Point; Pour Point.
Selection of Lubricants.

Module VI: Corrosion
Introduction, Mechanism of dry & wet corrosion,
Types of corrosion-Galvanic, Concentration cell, soil, pitting, intergranular, waterline. Passivity.
Factors influencing corrosion.
Corrosion control.

Examination Scheme:

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Text & References:

Text:
- Engineering Chemistry - Jain & Jain
- Engineering Chemistry - Sunita Rattan
- Engineering Chemistry - Shashi Chawla
References:
- Engineering Chemistry – Dara & Dara
- Spectroscopy - Y.R Sharma
- Corrosion Engineering – Fontenna & Greene
Course Objective:
The objective of this course is to impart the basic knowledge of thermodynamics, stress - strain, materials & their properties and various manufacturing processes to the students of all engineering discipline.

Course Contents:

Module I: Fundamental Concepts

Module II: Stress & Strain Analysis
Simple stress & strain: introduction, normal shear, and stresses-strain diagrams for ductile & brittle materials. Elastic constants, one-dimensional loadings of members of varying cross-section, Strain Energy. Properties of material-strength, elasticity, stiffness, malleability, ductility, brittleness, hardness & plasticity etc; Concept of stress & strain stress strain diagram, tensile test, impact test, hardness test.

Module III: Casting & Forging
Introduction of casting, pattern, mould making procedures, sand mould casting, casting defects, allowances of pattern. Forging-introduction, upsetting & drawing out, drop forging, press forging & m/c forging.

Module IV: Welding & Sheet metal working

Examination Scheme:

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Text & References:

INTRODUCTION TO COMPUTERS AND PROGRAMMING IN C

Course Code: BTA 105  Credit Units: 02

Course Objective:
The objective of this course module is to acquaint the students with the basics of computers system, its components, data representation inside computer & to get them familiar with various important features of procedure oriented programming language i.e. C.

Course Contents:

Module I: Introduction
Introduction to computer, history, von-Neumann architecture, memory system (hierarchy, characteristics & types), H/W concepts (I/O Devices), S/W concepts (System S/W & Application S/W, utilities). Data Representation: Number systems, character representation codes, Binary, octal, hexadecimal & their interconversions. Binary arithmetic, floating point arithmetic, signed & unsigned numbers, Memory storage unit.

Module II: Programming in C

Module III: Fundamental Features in C
C Statements, conditional executing using if, else, nesting of if, switch and break Concepts of loops, example of loops in C using for, while and do-while, continue and break. Storage types (automatic, register etc.), predefined processor, Command Line Argument.

Module IV: Arrays and Functions
One dimensional arrays & example of iterative programs using arrays, 2-D arrays Use in matrix computations. Concept of Sub-programming, functions Example of user defined functions. Function prototype, Return values and their types, calling function, function argument, function with variable number of argument, recursion.

Module V: Advanced features in C
Pointers, relationship between arrays & pointers Argument passing using pointers, Array of pointers. Passing arrays as arguments.
Strings & C string library.
Structure & Union. Defining C structures, Giving values to members, Array of structure, Nested structure, passing strings as arguments.
File Handling.

Examination Scheme:

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Text & References:

Text:
- “ANSI C” by E Balagurusamy

References:
Course Objective:
The objective of the course is to provide a brief knowledge of Electrical Engineering to students of all disciplines. This course includes some theorems related to electrical, some laws related to flow of current, voltages, basic knowledge of Transformer, basic knowledge of electromagnetism, basic knowledge of electrical network.

Course Contents:

Module I: Basic Electrical Quantities

Module II: Network Analysis Techniques & Theorems

Module III: Alternating Current Circuits
Peak, Average & RMS values for alternating currents, Power calculation: reactive power, active power, Complex power, power factor, impedance, reactance, conductance, susceptance Resonance: series Resonance, parallel resonance, basic definition of Q factor & Band-width.

Module IV: Transformers
Basic Transformer Operation principle, Construction, Voltage relations, current relations, Linear circuit models, open circuit test, short circuit test, Transformer Efficiency.

Examination Scheme:

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Text & References:

- R.J. Smith, R.C. Dorf: Circuits, devices & Systems
- B.L. Thareja: Electrical Technology: Part -1 & 2
- V. Deltoro: Electrical Engineering fundamentals
- Schaum's Series: Electrical Circuits
APPLIED PHYSICS LAB - I

Course Code: BTA 120          Credit Units: 01

List of Experiments:

1. To determine the wavelength of sodium light by Newton’s rings method.
2. To determine the dispersive power of the material of prism with the help of a spectrometer.
3. To determine the specific rotation of sugar by Bi-quartz or Laurent half shade polarimeter.
4. To determine the speed of ultrasonic waves in liquid by diffraction method.
5. To determine the width of a narrow slit using diffraction phenomena.
6. To determine the temperature coefficient of platinum wire, using a platinum resistance thermometer & a Callender & Griffith’s bridge.
7. To determine the value of specific charge (ratio of e/m) of an electron by Thomson method.
8. To determine the internal resistance of Leclanche cell with the help of Potentiometer.
9. To determine the resistance per unit length of a Carey Foster’s bridge wire & also to find out the specific resistance of a given wire.
10. To plot graph showing the variation of magnetic field with distance along the axis of a circular coil carrying current, & hence estimate the radius of the coil.
11. To determine the value of acceleration due to gravity (‘g’) in the laboratory using bar pendulum.
12. To determine the moment of inertia of a flywheel about its own axis of rotation.
13. To determine the density of material of the given wire with the help of sonometer.

Examination Scheme:

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

Course Code: BTA 121 Credit Units: 01

Course Contents:

List of Experiments:

(Any 10 Experiments)

1. To determine the ion exchange capacity of a given cation exchanger.

2. To determine the temporary, permanent & total hardness of a sample of water by complexometric titration method.

3. To determine the type & extent of alkalinity of given water sample.

4. To determine the number of water molecules of crystallization in Mohr’s salt (ferrous ammonium sulphate) provided standard potassium dichromate solution (0.1N) using diphenylamine as internal indicator.

5. To determine the ferrous content in the supplied sample of iron ore by titrimetric analysis against standard \( K_2Cr_2O_7 \) solution using potassium ferricyanide \( [K_3Fe(CN)_6] \) as external indicator.

6. (a) To determine the surface tension of a given liquid by drop number method.
   (b) To determine the composition of a liquid mixture A and B (acetic acid & water) by surface tension method.

7. To prepare & describe a titration curve for phosphoric acid – sodium hydroxide titration using pH-meter.

8. (a) To find the cell constant of conductivity cell.
   (b) Determine the strength of hydrochloric acid solution by titrating it against standard sodium hydroxide solution conductometrically


10 To determine the total residual chlorine in water.

11 Determination of amount of oxalic acid and \( H_2SO_4 \) in 1 L of solution using N/10 NaOH and N/10 KMnO_4 solution.

12 Determination of viscosity of given oil by means of Redwood viscometer I.

13 To determine flash point & fire point of an oil by Pensky Martin’s Apparatus

14 To determine the Iodine value of the oil.

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

Course Code: BTA 122	Credit Units: 01

Course Contents:

1. Welding
   (a) Arc Welding - Butt Joint
       - Lap Joint
       - T Joint
   (b) Gas Welding - Butt Joint
       - Lap Joint
       - Brazing of Broken pieces
2. Foundry
   - Sand mould casting by single piece pattern
     Split pattern bracket with cores
3. Sheet Metal
   - Dust Bin
   - Mug
   - Funnel
   - Cylindrical Mug with handle-Rectangular
4. Fitting Shop
   - Male – Female Joint
   - Rectangular piece
   - Filing the job

Examination Scheme:

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

Course Code: BTV 123 Credit Units: 01

Software Required: Turbo C

Course Contents:

- C program involving problems like finding the nth value of cosine series, Fibonacci series. Etc.
- C programs including user defined function calls
- C programs involving pointers, & solving various problems with the help of those.
- File handling

Examination Scheme:

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Note: IA – Internal Assessment, EE - External Exam, PR - Performance, LR – Lab Record, V – Viva.
Course Code: BTV 124  Credit Units: 01

List of Experiments:
1. To verify KVL & KCL in the given network.
2. To verify Superposition Theorem.
3. To verify Maximum Power Transfer Theorem.
4. To verify Reciprocity Theorem.
5. To determine & verify RTh, VTh, RN, IN in a given network.
6. To perform open circuit & short circuit test on a single-phase transformer.
7. To study transient response of a given RLC Circuit.
8. To perform regulation, ratio & polarity test on a single-phase transformer.
9. To measure power & power factor in a three phase circuit by two wattmeter method.
10. To measure power & power factor in a three phase load using three ammeter & three voltmeter method.

Examination Scheme:

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

Course Code: BTV 125
Credit Units: 01

Course Objective:
This course will provide students concepts on the drawings of different curves like straight line, parabola, ellipse etc. After completion of this course, students will be able to draw different figures manually & will be capable of using various instruments involved in drawings.

Course Contents:

Module I: General
Importance, Significance & scope of engineering drawing. Lettering, Dimensioning, Scales, Sense of proportioning, Different types of projections, Orthographic Projection, B.I.S. Specifications.

Module II: Projections of Point & Lines
Introduction of planes of projection, Reference & auxiliary planes, projections of points & Lines in different quadrants, traces, inclinations, & true lengths of the lines, projections on Auxiliary planes, shortest distance, intersecting & non-intersecting lines.

Module III: Planes other than the Reference Planes
Introduction of other planes (perpendicular & oblique), their traces, inclinations etc., Projections of points & lines lying in the planes, conversion of oblique plane into auxiliary Plane & solution of related problems.

Module IV: Projections of Plane Figures
Different cases of plane figures (of different shapes) making different angles with one or both reference planes & lines lying in the plane figures making different given angles (with one of both reference planes). Obtaining true shape of the plane figure by projection.

Module V: Projection of Solids
Simple cases when solid is placed in different positions, Axis faces & lines lying in the faces of the solid making given angles.

Module VI: Development of Surface
Development of simple objects with & without sectioning. Isometric Projection

Examination Scheme:

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

Text & References:
- PS Gill, Engineering Drawing, Kataria Publication
- ND Bhatt, Engineering Drawing, Charotar publications
- N. Sidheshwar, Engineering Drawing, Tata McGraw Hill
- CL Tanta, Mechanical Drawing, “Dhanpat Rai”
**ENGLISH**

**Course Objective:**
The course is intended to give a foundation of English Language. The literary texts are intended to help students to inculcate creative & aesthetic sensitivity & critical faculty through comprehension, appreciation and analysis of the prescribed literary texts. It will also help them to respond from different perspectives.

**Course Contents:**

**Module I: Vocabulary**
- Use of Dictionary
- Use of Words: Diminutives, Homonyms & Homophones

**Module II: Essentials of Grammar - I**
- Articles
- Parts of Speech
- Tenses

**Module III: Essentials of Grammar - II**
- Sentence Structure
- Subject - Verb agreement
- Punctuation

**Module IV: Communication**
- The process and importance
- Principles & benefits of Effective Communication

**Module V: Spoken English Communication**
- Speech Drills
- Pronunciation and accent
- Stress and Intonation

**Module VI: Communication Skills - I**
- Developing listening skills
- Developing speaking skills

**Module VII: Communication Skills - II**
- Developing Reading Skills
- Developing writing Skills

**Module VIII: Written English Communication**
- Progression of Thought/ideas
- Structure of Paragraph
- Structure of Essays

**Module IV: Short Stories**
- Of Studies, by Francis Bacon
- Dream Children, by Charles Lamb
- The Necklace, by Guy de Maupassant
- A Shadow, by R.K. Narayan
- Glory at Twilight, Bhabani Bhattacharya

**Module V: Poems**
- All the Worlds a Stage, Shakespeare
- To Autumn, Keats
- O! Captain, My Captain, Walt Whitman
- Where the Mind is Without Fear, Rabindranath Tagore
- Psalm of Life, H.W. Longfellow

**Examination Scheme:**

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</table>
Text & References:

- Madhulika Jha, Echoes, Orient Long Man
- Successful Communications, Malra Treece (Allyn and Bacon)
- Effective Technical Communication, M. Ashraf Rizvi.

* 30 hrs Programme to be continued for Full year
BEHAVIOURAL SCIENCE - I  
(UNDERSTANDING SELF FOR EFFECTIVENESS)

Course Code: BTV 143  Credit Units: 01

Course Objective:
This course aims at imparting:
- Understanding self & process of self exploration
- Learning strategies for development of a healthy self esteem
- Importance of attitudes and its effective on personality
- Building Emotional Competence

Course Contents:

Module I: Self: Core Competency
Understanding of Self
Components of Self – Self identity
Self concept
Self confidence
Self image

Module II: Techniques of Self Awareness
Exploration through Johari Window
Mapping the key characteristics of self
Framing a chart for self
Stages – self awareness, self acceptance and self realization

Module III: Self Esteem & Effectiveness
Meaning and Importance
Components of self esteem
High and low self esteem
Measuring your self esteem

Module IV: Building Positive Attitude
Meaning and nature of attitude
Components and Types of attitude
Importance and relevance of attitude

Module V: Building Emotional Competence
Emotional Intelligence – Meaning, components, Importance and Relevance
Positive and Negative emotions
Healthy and Unhealthy expression of emotions

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:
- Organizational Behaviour, Davis, K.
- Bates, A. P. and Julian, J.: Sociology - Understanding Social Behaviour
- Dressler, David and Cans, Donald: The Study of Human Interaction
• LaFasto and Larson: When Teams Work Best, 2001. Response Books (Sage), New Delhi
• J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company
Course Code: BTV 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: BTV 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!, 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 nationaliteit 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: BTV 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: BTV 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 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.

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
- “Elementary Chinese Reader Part I” Lesson 1-10
APPLIED MATHEMATICS – II

Course Code: BTV 201 Credit Units: 04

Course Objective:
The knowledge of Mathematics is necessary for a better understanding of almost all the Engineering and Science subjects. Here our intention is to make the students acquainted with the concept of basic topics from Mathematics, which they need to pursue their Engineering degree in different disciplines.

Course Contents:

Module I: Linear Algebra

Module II: Infinite Series

Module III: Complex Analysis
De Moivre’s Theorem and Roots of Complex Numbers, Logarithmic Functions, Circular, Hyperbolic Functions and their Inverses.
Functions of a Complex Variables, Limits, Continuity and Derivatives, Analytic Function, Cauchy-Riemann Equations (without proof), Harmonic Function, Harmonic Conjugates, Conformal Mapping, Bilinear Transformations, Complex Line Integral, Cauchy Integral Theorem, Cauchy Integral Formula, Derivative of Analytic Function, Power Series, Taylor Series, Laurent Series, Zeros and Singularities, Residues, Residue Theorem, Evaluation of Real Integrals of the Form \[ \int_{0}^{2\pi} F(\cos \theta, \sin \theta) \, d\theta \quad \text{and} \quad \int_{-\infty}^{\infty} \frac{f(x)}{F(x)} \, dx \].

Module IV: Statistics and Probability

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:

- Engineering Mathematics by Erwin Kreyszig.
- Engineering Mathematics by B.S. Grewal.
- Differential Calculus by Shanti Narain.
- Integral Calculus by Shanti Narain.
- Linear Algebra- Schaum Outline Series.
APPLIED PHYSICS - II - MODERN PHYSICS

Course Code: BTV 202 Credit Units: 03

Course Objective:
Aim of this course is to introduce the students to fundamentals of graduate level physics which form the basis of all applied science and engineering.

Course Contents:

Module I: Special Theory of Relativity
Michelson-Morley experiment, Importance of negative result, Inertial & non-inertial frames of reference, Einstein’s postulates of Special theory of Relativity, Space-time coordinate system, Relativistic Space-Time transformation (Lorentz transformation equation), Transformation of velocity, Addition of velocities, Length contraction and Time dilation, Mass-energy equivalence (Einstein’s energy mass relation) & Derivation of Variation of mass with velocity.

Module II: Wave Mechanics
Wave particle duality, De-Broglie matter waves, phase and group velocity, Heisenberg uncertainty principle, wave function and its physical interpretation, Operators, expectation values. Time dependent & time independent Schrödinger wave equation for free & bound states, square well potential (rigid wall), Step potential.

Module III: Atomic Physics
Vector atom model, LS and j-j coupling, Zeceman effect (normal & anomalous), Paschen-Bach effect, X-ray spectra and energy level diagram, Moseleys Law, Lasers – Einstein coefficients, conditions for light amplification, population inversion, optical pumping, three level and four level lasers, He-Ne and Ruby laser, Properties and applications of lasers.

Module IV: Solid State Physics
Sommerfeld’s free electron theory of metals, Fermi energy, Introduction to periodic potential & Kronig-Penny model (Qualitative) Band Theory of Solids, Semi-conductors: Intrinsics and Extrinsic Semiconductors, photoconductivity and photovoltaics, Basic aspects of Superconductivity, Meissner effect.

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

Text & References:

- Concept of Modern Physics, A. Beiser
- Applied Physics II, Agarawal & Goel
- Solid State Physics, S. O. Pallai
- Physics of Atom, Wehr & Richards
ENVIRONMENTAL STUDIES

Course Code: BTV 203  Credit Units: 04

Course Objective:
The term environment is used to describe, in the aggregate, all the external forces, influences and conditions, which affect the life, nature, behaviour and the growth, development and maturity of living organisms. At present a great number of environment issues, have grown in size and complexity day by day, threatening the survival of mankind on earth. A study of environmental studies is quite essential in all types of environmental sciences, environmental engineering and industrial management. The objective of environmental studies is to enlighten the masses about the importance of the protection and conservation of our environment and control of human activities which has an adverse effect on the environment.

Course Contents:

Module I: The multidisciplinary nature of environmental studies
Definition, scope and importance
Need for public awareness

Module II: Natural Resources
Renewable and non-renewable resources:
Natural resources and associated problems
Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, salinity, case studies.
Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.
Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

Module III: Ecosystems
Concept of an ecosystem
Structure and function of an ecosystem
Producers, consumers and decomposers
Energy flow in the ecosystem
Ecological succession
Food chains, food webs and ecological pyramids
Introduction, types, characteristic features, structure and function of the following ecosystem:
  a. Forest ecosystem
  b. Grassland ecosystem
  c. Desert ecosystem
  d. Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries)

Module IV: Biodiversity and its conservation
Introduction – Definition: genetic, species and ecosystem diversity
Biogeographical classification of India
Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and option values
Biodiversity at global, national and local levels
India as a mega-diversity nation
Hot-spots of biodiversity
Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts
Endangered and endemic species of India
Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

Module V: Environmental Pollution
Definition
Causes, effects and control measures of:
  a. Air pollution
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. Nuclear pollution

Solid waste management: Causes, effects and control measures of urban and industrial wastes.
Role of an individual in prevention of pollution.
Pollution case studies
Disaster management: floods, earthquake, cyclone and landslides.

Module VI: Social Issues and the Environment
From unsustainable to sustainable development
Urban problems and related to energy
Water conservation, rain water harvesting, watershed management
Resettlement and rehabilitation of people; its problems and concerns. Case studies.
Environmental ethics: Issues and possible solutions
Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
Wasteland reclamation
Consumerism and waste products
Environmental Protection Act
Air (Prevention and Control of Pollution) Act
Water (Prevention and control of Pollution) Act
Wildlife Protection Act
Forest Conservation Act
Issues involved in enforcement of environmental legislation
Public awareness

Module VII: Human Population and the Environment
Population growth, variation among nations
Population explosion – Family Welfare Programmes
Environment and human health
Human Rights
Value Education
HIV / AIDS
Women and Child Welfare
Role of Information Technology in Environment and Human Health
Case Studies

Module VIII: Field Work
Visit to a local area to document environmental assets - river / forest / grassland / hill / mountain.
Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
Study of common plants, insects, birds
Study of simple ecosystems - pond, river, hill slopes, etc (Field work equal to 5 lecture hours)

Examination Scheme:

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</table>

Text & References:

- Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad 380 013, India, Email: mapin@icenet.net (R)
- Clark R.S., Marine Pollution, Claderson Press Oxford (TB)
- De A.K., Environmental Chemistry, Wiley Eastern Ltd.
- Down to Earth, Centre for Science and Environment (R)
- Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
• Mhaskar A.K., Matter Hazardous, Techno-Science Publication (TB)
• Survey of the Environment, The Hindu (M)
• Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Science
• Trivedi R.K., Handbook of Environmental Laws, Rules Guidelines, Compliances and Standards, Vol I and II, Enviro Media (R)
• Trivedi R. K. and P.K. Goel, Introduction to air pollution, Techno-Science Publication (TB)
OBJECT ORIENTED PROGRAMMING USING C++

Course Code: BTV 204  Credit Units: 03

Course Objective:
The objective of this module is to introduce object oriented programming. To explore and implement the various features of OOP such as inheritance, polymorphism. Exceptional handling using programming language C++. After completing this course student can easily identify the basic difference between the programming approaches like procedural and object oriented.

Course Contents:

Module I: Introduction

Module II: Classes and Objects
Abstract data types, Object & classes, attributes, methods, C++ class declaration, Local Class and Global Class, State identity and behaviour of an object, Local Object and Global Object, Scope resolution operator, Friend Functions, Inline functions, Constructors and destructors, instantiation of objects, Types of Constructors, Static Class Data, Array of Objects, Constant member functions and Objects, Memory management Operators.

Module III: Inheritance
Inheritance, Types of Inheritance, access modes – public, private & protected, Abstract Classes, Ambiguity resolution using scope resolution operator and Virtual base class, Aggregation, composition vs classification hierarchies, Overriding inheritance methods, Constructors in derived classes, Nesting of Classes.

Module IV: Polymorphism
Polymorphism, Type of Polymorphism – Compile time and runtime, Function Overloading, Operator Overloading (Unary and Binary) Polymorphism by parameter, Pointer to objects, this pointer, Virtual Functions, pure virtual functions.

Module V: Strings, Files and Exception Handling

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:

Text:
- “Object Oriented Programming with C++” By E. Balagurusamy.

References:
ENGINEERING MECHANICS

Course Code: BTV 205 Credit Units: 03

Course Objective:
Objective of this course is to provide fundamental knowledge of force system and its effect on the behaviour of the bodies that may be in dynamic or in static state. It includes the equilibrium of different structures like beams, frames, truss etc and the force transfer mechanism in the different components of a body under given loading condition.

Course Contents:

Module I: Force system & Structure
Free body diagram, Equilibrium equations and applications. Plane truss, perfect and imperfect truss, assumption in the truss analysis, analysis of perfect plane trusses by the method of joints, method of section.

Module II: Friction
Static and Kinetic friction, laws of dry friction, co-efficient of friction, angle of friction, angle of repose, cone of friction, friction lock, efficiency of screw jack, transmission of power through belt

Module III: Distributed Force
Determination of center of gravity, center of mass and centroid by direct integration and by the method of composite bodies, mass moment of inertia and area moment of inertia by direct integration and composite bodies method, radius of gyration, parallel axis theorem, Pappus theorems and its application, polar moment of inertia.

Module IV: Work -Energy
Work energy equation, conservation of energy, Virtual work, impulse, momentum conservation, impact of bodies, co-efficient of restitution, loss of energy during impact, D’alembert principle

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:

- S.S. Bhavikatti, Engineering Mechanics, New Age International Ltd
- Timoshenko, Engineering Mechanics, McGraw Hill
APPLIED PHYSICS LAB - II

Course Code: BTV 220
Credit Units: 01

Course Contents:

List of Experiments:

1. To determine the wavelength of prominent lines of mercury spectrum using plane transmission grating.
2. To determine the thickness of a given wire by Wedge method.
3. To determine the wavelength of He-Ne laser light using single slit.
4. To determine the frequency of an electrically maintained tuning fork by Melde’s method.
5. To study the variation of magnetic field along the axis of Helmholtz coil and to find out reduction factor.
6. To draw the V – I characteristics of a forward and reverse bias PN junction diode.
7. To determine the frequency of AC mains using sonometer.
8. To determine the energy band-gap of Germanium crystal using four probes method.
9. To draw V – I characteristics of a photocell and to verify the inverse square law of radiation.
10. To determine the acceleration due to gravity (‘g’) using Keter’s reversible pendulum.
11. To study the characteristics of photo voltaic cell (solar cell).

Examination Scheme:

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Note: IA – Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.
OBJECT ORIENTED PROGRAMMING USING C++ LAB

Course Code: BTV 221
Credit Units: 01

Software Required: Turbo C++

Course Contents:

- Creation of objects in programs and solving problems through them.
- Different use of private, public member variables and functions and friend functions.
- Use of constructors and destructors.
- Operator overloading
- Use of inheritance in and accessing objects of different derived classes.
- Polymorphism and virtual functions (using pointers).
- File handling.

Examination Scheme:

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

**Course Code:** BTV 222  
**Credit Units:** 01

## Course Contents:

Engineering Mechanics:

- To verify the law of Force Polygon
- To verify the law of Moments using Parallel Force apparatus. (Simply supported type)
- To determine the co-efficient of friction between wood and various surface (like Leather, Wood, Aluminum) on an inclined plane.
- To find the forces in the members of Jib Crane.
- To determine the mechanical advantage, Velocity ratio and efficiency of a screw jack.
- To determine the mechanical advantage, Velocity ratio and Mechanical efficiency of the Wheel and Axle
- To determine the MA, VR, $\eta$ of Worm Wheel (2-start)
- Verification of force transmitted by members of given truss.
- To verify the law of moments using Bell crank lever
- To find CG and moment of inertia of an irregular body using Computation method

## Examination Scheme:

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

Course Code: BTV 240  Credit Units: 03

Course Objective:
The course is intended to give a foundation of English Language. The literary texts are intended to help students to inculcate creative & aesthetic sensitivity and critical faculty through comprehension, appreciation and analysis of the prescribed literary texts. It will also help them to respond from different perspectives.

Course Contents:

Module I: Vocabulary
Use of Dictionary
Use of Words: Diminutives, Homonyms & Homophones

Module II: Essentials of Grammar - I
Articles
Parts of Speech
Tenses

Module III: Essentials of Grammar - II
Sentence Structure
Subject -Verb agreement
Punctuation

Module IV: Communication
The process and importance
Principles & benefits of Effective Communication

Module V: Spoken English Communication
Speech Drills
Pronunciation and accent
Stress and Intonation

Module VI: Communication Skills-I
Developing listening skills
Developing speaking skills

Module VII: Communication Skills-II
 Developing Reading Skills
Developing writing Skills

Module VIII: Written English communication
Progression of Thought/ideas
Structure of Paragraph
Structure of Essays

Module IV: Short Stories
Of Studies, by Francis Bacon
Dream Children, by Charles Lamb
The Necklace, by Guy de Maupassant
A Shadow, by R.K. Narayan
Glory at Twilight, Bhabani Bhattacharya

Module V: Poems
All the Worlds a Stage  Shakespeare
To Autumn  Keats
O! Captain, My Captain,  Walt Whitman
Where the Mind is Without Fear  Rabindranath Tagore
Psalm of Life  H.W. Longfellow

Examination Scheme:

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</table>
Text & References:

- Madhulika Jha, Echoes, Orient Long Man
- Successful Communications, Malra Treece (Allyn and Bacon)
- Effective Technical Communication, M. Ashraf Rizvi.
BEHAVIOURAL SCIENCE - II
(PROBLEM SOLVING AND CREATIVE THINKING)

Course Code: BTV 243  Credit Units: 01

Course Objective:
To enable the students:
- Understand the process of problem solving and creative thinking.
- Facilitation and enhancement of skills required for decision-making.

Course Contents:

Module I: Thinking as a tool for Problem Solving
What is thinking: The Mind/Brain/Behaviour
Critical Thinking and Learning:
- Making Predictions and Reasoning
- Memory and Critical Thinking
- Emotions and Critical Thinking
Thinking skills

Module II: Hindrances to Problem Solving Process
Perception
Expression
Emotion
Intellect
Work environment

Module III: Problem Solving
Recognizing and Defining a problem
Analyzing the problem (potential causes)
Developing possible alternatives
Evaluating Solutions
Resolution of problem
Implementation
Barriers to problem solving:
- Perception
- Expression
- Emotion
- Intellect
- Work environment

Module IV: Plan of Action
Construction of POA
Monitoring
Reviewing and analyzing the outcome

Module V: Creative Thinking
Definition and meaning of creativity
The nature of creative thinking
- Convergent and Divergent thinking
- Idea generation and evaluation (Brain Storming)
- Image generation and evaluation
- Debating
The six-phase model of Creative Thinking: ICEDIP model

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:

- Michael Steven: How to be a better problem solver, Kogan Page, New Delhi, 1999
- Geoff Petty: How to be better at creativity; Kogan Page, New Delhi, 1999
- Phil Lowe Koge Page: Creativity and Problem Solving, New Delhi, 1996
Course Code: BTV 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
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: BTV 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, Schmoe, Deutsch als Fremdsprache 1A, Grundkurs
SPANISH – II

Course Code: BTV 246
Credit Units: 02

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

Course Contents:

Module I
Revision of earlier modules.

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

Module III
More verbal phrases (eg, Dios Mio, Que lastima etc), adverbs (bueno/malo, muy, mucho, bastante, poco). Simple texts based on grammar and vocabulary done in earlier modules.

Module IV
Possessive pronouns

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

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

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

Course Code: BTV 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: BTV 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.
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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- “Elementary Chinese Reader Part I” Lesson 11-20
Course Code: BTV 301
Credit Units: 04

Course Objective:
The knowledge of Mathematics is necessary for a better understanding of almost all the Engineering and Science subjects. Here our intention is to make the students acquainted with the concept of basic topics from Mathematics, which they need to pursue their Engineering degree in different disciplines.

Course Contents:

Module I: Partial Differential Equations
Formation of PDE, Equations solvable by direct integration, Linear equations of the first order, Non-linear equations of the first order, Charpit’s method, Homogeneous linear equations with constant coefficients, Non homogeneous linear equations.

Module II: Fourier Series
Periodic Functions, Fourier Series, Functions having points of discontinuity, Even or Odd Functions, Change of Interval, Half-range series, Parseval’s Formula, Complex form of Fourier series, Practical Harmonic Analysis, Fourier Transforms, Sine and Cosine Transforms.

Module III: Laplace Transformation

Module IV: Linear Programming

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:

Text:
- Differential Calculus by Shanti Narain
- Integral Calculus by Shanti Narain
- Higher Engineering Mathematics by B.S. Grewal

References:
- Differential Equations by A.R. Forsyth
- Higher Engineering Mathematics by H.K. Dass
- Partial Differential Equations by I.N. Snedon
ENGINEERING GEOLOGY

Course Code: BTV 302  Credit Units: 03

Course Objective:
The student is given an introduction to basics of Geology genesis and characteristic of rocks: Geological structure and other effects of civil engineering structures. Geology of India is introduced.

Course Contents:

Module I: Branches and scope of geology
Physical geology
Geological agents and their action, weathering, volcanism, earthquake and plate tectonics

Module II: Elements of crystallography and mineralogy
Petrology
Types of rocks, genesis and physical and chemical characters, Building stones

Module III: Structural geology
Types of structures and classification and their effect on civil engineering projects and Geological mapping
Hydrogeology
Groundwater and occurrence, investigations, quality, artificial recharge

Module IV: Geology in Civil Engineering
Tunnels, dams, reservoirs, bridges, Runways, Roads and Buildings,
Slope failures and landslides. Investigations, Remote sensing and GIS applications
Geology of India
Types, age and occurrence of rock formations and economic importance

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:

- Parbin Singh, Engineering & General Geology, S.K. Kataria & Sons, New Delhi (2008)
MECHANICS OF SOLIDS

Course Code: BTV 303    Credit Units: 03

Course Objective:
The objective of this course is to make the students understand the concept of stress and strain in different types of structure/machine under different loading conditions. The course also covers the simple and compound stresses due to forces, stresses and deflection in beams due to bending, torsion in circular section, strain energy, different theories of failure, stress in thin cylinder thick cylinder and spheres due to external and internal pressure.

Course Contents:

Module I: Simple stresses and strains
Concept of stress and strain; Hooke’s law, Young’s modulus, Poisson ratio, stress at a point, stress and strains in bars subjected to axial loading. Modulus of elasticity, stress produced in compound bars subject to axial loading. Temperature stress and strain calculations due to applications of axial loads and variation of temperature in single and compound walls. Impact loading.

Module II: Compound stress and strains
The two dimensional system; stress at a point on a plane, principal stresses and principal planes; Mohr’s circle of stress. Graphical and Analytical methods for stresses on oblique section of body. Shear force and bending moment diagrams for cantilever, simply supported and overhanging beams.

Module III
Theory of bending stresses in beams due to bending, assumptions in the simple bending theory, derivation of formula: its application to beams of rectangular, circular and channel sections, composite / flitched beams, bending and shear stresses in composite beams.

Module IV: Torsion
Derivation of torsion equation and its assumptions. Applications of the equation of the hollow and solid circular shafts torsional rigidity, combined torsion and bending of circular shafts principal stress and maximum shear stresses under combined loading of bending and torsion, analysis of close-coiled-helical springs.

Module V: Thin cylinders and spheres
Derivation of formulae and calculation of hoop stress, longitudinal stress in a cylinder and sphere subjected to internal pressure.

Module VI: Columns and struts
Columns and failure of columns, Euler’s formulas; Rankine-Gordon’s formula, Johnson’s empirical formula for axially loaded columns and their applications.

Module VII: Slope and deflection
Relationship between moment, slope and deflection, Mohr’s theorem; Moment area method; method of integration; Macaulay’s method: Use of all these methods to calculate slope and deflection for the following:
   a) Cantilevers
   b) Simply supported beams with or without overhang
   c) Under concentrated loads, uniformly distributed loads or combination of concentrated and uniformly distributed loads

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Text & References:

Text:
References:

MECHANICS OF FLUIDS

Course Code: BTV 304  Credit Units: 04

Course Objective:
The objective of Fluid Mechanics subject is that students should understand the properties of fluids, pressure measurement devices, hydraulic forces on surfaces, buoyancy and flotation in fluids, kinematics and static behavior of fluids, dimension and model analysis, laminar and turbulent flow, flow through pipes and orifices, boundary layer theory.

Course Contents:

Module I: Fluid Properties and Fluid Statics
Newtonian and Non-Newtonian Fluids; Viscosity; Incompressible and compressible fluids, compressibility. Forces on plane surfaces, forces on curved surfaces, buoyant forces, and stability of floating bodies, metacentre and metacentre height.

Module II: Kinematics of Fluid Motion
Steady and unsteady flow; uniform and non-uniform flow; Laminar and turbulent flow; streamline, path line and streak line; continuity equation, irrotational and rotational flow, velocity potential and stream function, vortex flow, free and forced vortex.

Module III: Dynamics of Fluid Flow
Euler’s equation of motion and its integration to yield Bernoulli’s equation, its practical applications – Pilot tube, Venturi meter; steady flow momentum equation, force exerted on a pipe bend.

Module IV: Dimensional Analysis and Principles of Similarity
Buckingham π-Theorem and its applications, Geometric, Kinematics and Dynamic similarity; Dimensionless numbers-Reynolds, Froude, Euler, Mach, Weber Number and their significance.

Module V: Laminar and Turbulent Flow
Reynold’s experiment, critical velocity, steady lamnar flow through a circular tube, flow between parallel plates, measurement of viscosity. Transition from laminar to turbulent flow, courses of turbulence, velocity distribution law near a solid boundary, velocity distribution in rough pipes, Hazen – Williams’s formula.

Module VI: Analysis of Pipe Flow
Energy losses, minor losses in pipe lines, concept of equivalent length, flow between two reservoirs, and multiple pipe systems – in series and parallel, siphon.

Module VII: Flow Measurements

Examination Scheme:

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Text & References:

Text:

References:
- F. M. White, Introduction to Fluid Mechanics, McGraw Hill
BUILDING TECHNOLOGY

Course Code: BTV 305  Credit Units: 03

Course Objective:
The course covers building materials and their testing, cement and its applications foundation and structural members of building. Different areas and utilities of building like floors, doors etc.

Course Contents:

Module I
Building stones - Classification of rocks - Quarrying - Dressing - Properties and uses of common type of stones; Timber - Defects - Seasoning - Decay - Preservation - Plywood, fibre board, particle board; Clay products - Bricks - Manufacture - IS classifications - Properties and testing - Types of bricks - Tiles - Manufacture, properties and uses - Types of tiles; Ceramic products - Lime - Classification - Manufacture, properties and uses.

Module II
Cement - Ingredients - Manufacture - Types of cement - Properties and testing - Uses; Mortar - Sand - Properties - Types of mortar and uses; Concrete - Properties of fresh concrete and tests - Proportioning of concrete mixes - Properties of hardened concrete and tests – Recent developments in concrete; Iron and steel - Structural sections - Properties and uses of structural steel - Recent developments; Miscellaneous materials - Glass - Plastics - A.C.sheets – Thermocole.

Module III
Foundation - Timbering of foundation trenches - Bearing capacity of soils - Improvement of bearing capacity - Settlement of foundation - Description of spread, grillage, raft and pile foundations; Brick and stone masonry - Bonds in brick work - Types of stone masonry - Cavity walls - Lintels and arches; concrete construction - Batching, mixing, placing, compacting and curing of concrete - form work - Precast concrete - Prestressed concrete - Recent developments in concreting; Partition walls - Types and features.

Module IV
Floors and flooring – Different types and applications; Doors, windows and ventilators - Different types; Finishing works; Building Failures - Concrete failure - Steel failure -Foundation failure - Other types of failures – Causes and Remedial measures – Building repairs - Shoring - Underpinning – Scaffolding; Tall buildings - Framed structures - Steel and concrete frames – Joints in steel and concrete frames - Introduction to prefabrication – Slip form and lift slab constructions; Fire proof construction - Fire load - Fire resisting properties of building materials – Fire extinguishing methods – Fire proof construction methods.

Examination Scheme:

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Text & References:

SURVEYING

Course Code: BTV 306  
Credit Units: 02

Course Objective:
Surveying is the basic element of mapping areas for civil engineering construction. Methods of surveying including leveling, and leveling methods, contours, estimation of volumes etc are covered.

Course Contents:

Module I
Introduction - classification of surveys - plane surveying - geodetic surveying – topographic surveying - reconnaissance - principle of working from whole to part - provision of control - conventional signs - chain survey - instruments - principles of chain survey - field book - plotting - tie line and check line - chaining and ranging - obstacles - chaining on sloping ground - errors in chain survey - uses of cross staff and optical square

Module II
Compass survey - prismatic compass - surveyor’s compass - whole circle and reduced bearing - true and magnetic bearing - dip and declination - local attraction - traversing - plotting - error of closure - graphical and analytical adjustments - plane table survey - instruments and accessories - different methods - orientation - advantages and disadvantages of plane tabling - two point problem - three point problem - errors in plane tabling - minor instruments - hand levels - clinometer - Ceylon ghat tracer - hypsometer - pantagraph - edigraph - box sextant - telescopic alidade

Module III
Levell ing - definition of level surfaces - mean sea level - reduced level - bench marks - levelling instruments - temporary and permanent adjustments - fly levelling - booking - reduction of levels - corrections for refraction and curvature - reciprocal levelling - longitudinal levelling and cross sectioning - contour survey - definition - characteristics of contour - uses of contour - methods of contouring - direct and indirect interpolation - plotting - areas and volumes - trapezoidal rule - Simpson’s rule - area from latitude and departure - uses of planimeter - volumes - trapezoidal and prismatic formula

Module IV

Examination Scheme:

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Text & References:
MECHANICS OF SOLIDS AND FLUIDS LAB

Course Code: BTV 320 Credit Units: 01

Course Contents:

Experimental work will be based on the following papers:
Mechanics of Solids
Fluid Mechanics

MECHANICS OF SOLIDS LAB

List of Experiments

- Universal Testing Machine
- Tensile Test (MS)
- Double Shear Test (MS)
- Compression Test (CI)
- Brinell Hardness No.
- Izod Impact
- Testing Machine
- Rockwell Hardness Tester
- Spring Stiffness (Spring Compression Testing machine)
- Torsion testing machine

FLUID MECHANICS LAB

List of Experiments

- Verification of Bernoulli’s Theorem
- Experiment using Venturimeter
- Determination of coefficient of Discharge $C_d$, $C_r$, $C_t$ Using
- Circular/triangular/rectangular orifice
- To find major head losses in a pipe line
- To find minor head losses in a pipe line (sudden expansion/contraction/bend)

Examination Scheme:

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Note: IA – Internal Assessment, EE – External Exam, PR – Performance, LR – Lab Record, V – Viva.
CIVIL ENGINEERING DRAWING LAB

Course Code: BTV 321  Credit Units: 01

Course Contents:

1. Panelled doors, glazed windows and ventilators in wood.
2. Steel and aluminium windows.
3. Steel roof trusses.
4. Reinforced concrete staircase.
5. Residential buildings with flat and pitched roof – RC and tiled.
6. Public buildings like office, dispensary, post office, bank etc.
7. Industrial buildings.

Examination Scheme:

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

Text & References:

- National Building Code of India
- Local Building Bye-laws
- Callender, John Hancock, Time Saver Standards for Architectural design Data, Tata McGraw Hill.
- Chiara, Callender, John Hancock, Time Saver Standards for Building Type, McGraw Hill
- Chiara, Joseph De, Time Saver Standards for Site Planning, McGraw Hill
SURVEYING PRACTICAL I

Course Code: BTV 322 Credit Units: 01

List of Exercises:

2. Compass survey - Traversing with compass and plotting.
8. Levelling Fly leveling – Rise and Fall method.
9. Levelling Longitudinal and cross sectioning.
10. Levelling Contour surveying.

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: BTV 341
Credit Units: 01

Course Objective:
To form written communication strategies necessary in the workplace

Course Contents:

Module I: Introduction to Writing Skills
Effective Writing Skills
Avoiding Common Errors
Paragraph Writing
Note Taking
Writing Assignments

Module II: Letter Writing
Types
Formats

Module III
Memo
Agenda and Minutes
Notice and Circulars

Module IV: Report Writing
Purpose and Scope of a Report
Fundamental Principles of Report Writing
Project Report Writing
Summer Internship Reports

Examination Scheme:

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</table>

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

Text & References:

- Business Communication, Raman – Prakash, Oxford
- Creative English for Communication, Krishnaswamy N, Macmillan
- Textbook of Business Communication, Ramaswami S, Macmillan
- Working in English, Jones, Cambridge
- Effective Writing, Withrow, Cambridge
- Writing Skills, Coe/Rycroft/Ernest, Cambridge
- Welcome!, Jones, Cambridge
BEHAVIOURAL SCIENCE - III  
(INTERPERSONAL COMMUNICATION)

Course Code: BTV 343  
Credit Units: 01

Course Objective:
This course provides practical guidance on
- Enhancing personal effectiveness and performance through effective interpersonal communication
- Enhancing their conflict management and negotiation skills

Course Contents:

Module I: Interpersonal Communication: An Introduction
Importance of Interpersonal Communication
Types – Self and Other Oriented
Rapport Building – NLP, Communication Mode
Steps to improve Interpersonal Communication

Module II: Behavioural Communication
Meaning and Nature of behavioural communication
Persuasion, Influence, Listening and Questioning
Guidelines for developing Human Communication skills
Relevance of Behavioural Communication for personal and professional development

Module III: Interpersonal Styles
Transactional Analysis
Life Position/Script Analysis
Games Analysis
Interational and Transactional Styles

Module IV: Conflict Management
Meaning and nature of conflicts
Styles and techniques of conflict management
Conflict management and interpersonal communication

Module V: Negotiation Skills
Meaning and Negotiation approaches (Traditional and Contemporary)
Process and strategies of negotiations
Negotiation and interpersonal communication

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
- Foster John, Effective Writing Skills: Volume-7, First Edition 2000, Institute of Public Relations (IPR)
  Beebe, Beebe and Redmond; Interpersonal Communication, 1996; Allyn and Bacon Publishers
FRENCH - III

Course Code: BTV 344 Credit Units: 02

Course Objective:
To provide the students with the know-how
- To master the current social communication skills in oral and 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

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
- le livre à suivre: Campus: Tome 1
Course Code: BTV 345

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
Course Code: BTV 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

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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: BTV 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.

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

Text:
➢ Teach yourself Japanese

References:
➢ Shin Nihongo no kiso 1
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
Dialog practice
Observe picture and answer the question.
Introduction of written characters.
Practice reading aloud
Practice using the language both by speaking and by taking notes.
Character writing and stroke order

Module II
Measure words
Position words e.g. inside, outside, middle, in front, behind, top, bottom, side, left, right, straight.
Directional words – beibian, xibian, nanbian, dongbian, zhongjian.
Our school and its different building locations.
What game do you like?
Difference between “hi” 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 “jìu” 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” (Complement 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
A term (or research) paper is primarily a record of intelligent reading in several sources on a particular subject. The students will choose the topic at the beginning of the session in consultation with the faculty assigned. The progress of the paper will be monitored regularly by the faculty. At the end of the semester the detailed paper on the topic will be submitted to the faculty assigned. The evaluation will be done by Board of examiners comprising of the faculties.

GUIDELINES FOR TERM PAPER

The procedure for writing a term paper may consist of the following steps:
1. Choosing a subject
2. Finding sources of materials
3. Collecting the notes
4. Outlining the paper
5. Writing the first draft
6. Editing & preparing the final paper

1. Choosing a Subject
The subject chosen should not be too general.

2. Finding Sources of materials
a) The material sources should be not more than 10 years old unless the nature of the paper is such that it involves examining older writings from a historical point of view.
b) Begin by making a list of subject-headings under which you might expect the subject to be listed.
c) The sources could be books and magazine articles, news stories, periodicals, scientific journals etc.

3. Collecting the notes
Skim through sources, locating the useful material, then make good notes of it, including quotes and information for footnotes.
   a) Get facts, not just opinions. Compare the facts with author's conclusion.
b) In research studies, notice the methods and procedures, results & conclusions.
c) Check cross references.

4. Outlining the paper
   a) Review notes to find main sub-divisions of the subject.
b) Sort the collected material again under each main division to find sub-sections for outline so that it begins to look more coherent and takes on a definite structure. If it does not, try going back and sorting again for main divisions, to see if another general pattern is possible.

5. Writing the first draft
Write the paper around the outline, being sure that you indicate in the first part of the paper what its purpose is. You may follow the following:
   a) statement of purpose
   b) main body of the paper
   c) statement of summary and conclusion
Avoid short, bumpy sentences and long straggling sentences with more than one main idea.

6. Editing & Preparing the final Paper
   a) Before writing a term paper, you should ensure you have a question which you attempt to answer in your paper. This question should be kept in mind throughout the paper. Include only information/details/analyses of relevance to the question at hand. Sometimes, the relevance of a particular section may be clear to you but not to your readers. To avoid this, ensure you briefly explain the relevance of every section.
b) Read the paper to ensure that the language is not awkward, and that it "flows" properly.
c) Check for proper spelling, phrasing and sentence construction.
d) Check for proper form on footnotes, quotes, and punctuation.
e) Check to see that quotations serve one of the following purposes:
   (i) Show evidence of what an author has said.
   (ii) Avoid misrepresentation through restatement.
   (iii) Save unnecessary writing when ideas have been well expressed by the original author.
f) Check for proper form on tables and graphs. Be certain that any table or graph is self-explanatory.

Term papers should be composed of the following sections:
1) Title page
2) Table of contents
3) Introduction
4) Review
5) Discussion & Conclusion
6) References
7) Appendix

Generally, the introduction, discussion, conclusion and bibliography part should account for a third of the paper and the review part should be two thirds of the paper.

Discussion
The discussion section either follows the results or may alternatively be integrated in the results section. The section should consist of a discussion of the results of the study focusing on the question posed in the research paper.

Conclusion
The conclusion is often thought of as the easiest part of the paper but should by no means be disregarded. There are a number of key components which should not be omitted. These include:
   a) summary of question posed
   b) summary of findings
   c) summary of main limitations of the study at hand
   d) details of possibilities for related future research

Reference
From the very beginning of a research project, you should be careful to note all details of articles gathered. The bibliography should contain ALL references included in the paper. References not included in the text in any form should NOT be included in the bibliography.
The key to a good bibliography is consistency. Choose a particular convention and stick to this.

Conventions
Monographs

Edited volumes
[(eds.) is used when there is more than one editor; and (ed.) where there is only one editor. In German the abbreviation used is (Hrsg.) for Herausgeber].

Edited articles

Journal articles

Electronic book

Electronic journal articles

Other websites

Unpublished papers
Unpublished theses/dissertations

Appendix
The appendix should be used for data collected (e.g. questionnaires, transcripts, ...) and for tables and graphs not included in the main text due to their subsidiary nature or to space constraints in the main text.

Assessment Scheme:

Continuous Evaluation: 40%
(Based on abstract writing, interim draft, general approach, research orientation, readings undertaken etc.)

Final Evaluation: 60%
(Based on the organization of the paper, objectives/problem profile/issue outlining, comprehensiveness of the research, flow of the idea/ideas, relevance of material used/presented, outcomes vs. objectives, presentation/viva etc.)
NUMERICAL ANALYSIS AND PROGRAMMING

Course Code: BTV 401  Credit Units: 03

Course Objective:
This course deals with the techniques of numerical analysis, which gives the solution to applied problem when ordinary analytical method fails. Emphasis is given on computer programming also so that the given techniques can be used in design of engineering and scientific problems.

Course Contents:

Module I
Solution of Algebraic and Transcendental Equation
Error in a series approximation, Bisection Method, Iteration method, Method of false position, Newton-Raphson method
Solutions of Simultaneous equation
Gauss elimination method, Jacobi iteration method, Gauss Seidal method

Module II: Interpolation
Finite Differences, Difference tables
Polynomial Interpolation: Newton’s forward and backward formula
Central Difference Formulae: Gauss forward and backward formula.
Interpolation with unequal intervals: Lagrange’s Interpolation, Newton Divided difference formula

Module III: Numerical Integration and Differentiation
Introduction, Numerical differentiation Numerical Integration: Trapezoidal rule, Simpson’s 1/3 and 3/8 rules

Module IV: Solution of differential Equations
Euler’s Method, Runga-Kutta Methods

Module V: Statistical Computation
Frequency chart, Curve fitting by method of least squares, fitting of straight lines, polynomials, exponential curves etc, Data fitting with Cubic splines

Examination Scheme:

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Text & References:

Text:
- Gerald & Whealey, “Applied Numerical Analyses”, AW

References:
- Pradip Niyogi, “Numerical Analysis and Algorithms”, TMH
- Francis Scheld,” Numerical Analysis”, TMH
- Sastry S.S., “Introductory Methods of Numerical Analysis”, Pearson Education
- Goyal, M, “Computer Based Numerical and Statistical Techniques”, Firewall Media, New Delhi
Course Code: BTV 402  
Credit Units: 04

Course Objective:
Structural Analysis, being the critical part in designing building and other structures, is important. Elastic theorems fixed and continuous beams, circular beams over simple support and theory of columns are covered in this course.

Course Contents:

Module I: Deflection of beams
Differential equation of the elastic curve - slope and deflection of beams by method of successive integration - Macaulay’s method - Moment area method - Conjugate beam method - Deflection due to shear.

Module II: Elastic theorems and energy principles
Strain energy and complementary energy - review of strain energy due to axial load - bending, shear and torsion - principle of superposition - principle of virtual work - Castigliano’s theorem for deflection - theorem of complementary energy - Betti’s theorem - Maxwell’s law of reciprocal deflections - principle of least work - application of method of virtual work (unit load method) and strain energy method for determination of deflections of statically determinate beams - pin-joined trusses and rigid frames - temperature effects.

Module III: Fixed and continuous beams
Statically indeterminate structures - degree of static and kinematic indeterminacies - brief introduction to force and displacement methods - fixed and continuous beams - force method - analysis by consistent deformation method - application of moment area and conjugate beam methods for fixed beams - theorem of three moments for continuous beams - shear force and bending moment diagrams - deflection and support settlement.

Module IV: Beams curved in plan
Analysis of cantilever beam curved in plan - analysis of circular beams over simple supports

Theory of columns
Axial loading of short strut - long columns - Euler’s Formula - Rankine Formula – Secant Formula - eccentric loading - direct and bending stresses – Buckling Load as an eigen value problem.

Examination Scheme:

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Texts & References:

HYDRO SYSTEMS

Course Code: BTV 403  Credit Units: 03

Course Objective:
Water flowing in various conditions like open channels weirs, canals systems are covered in this syllabus.

Course Contents:

Module I
Open channel flow in rigid boundary channels - Comparison with pipe flow, Classification of flow, uniform flow – Equations for uniform flow such as Chezy’s and Manning’s formula, Most efficient channel section – Circular. Rectangular, and Trapezoidal channel sections, Velocity distribution in open channels, Conveyance, Normal depth, Hydraulic exponent for uniform flow, Determination of normal depth and velocity, Specific energy and Specific force diagrams, Critical flow, Hydraulic exponent for critical flow, Channel transitions, Venturi, Standing wave and Parshall flumes.

Module II

Module III

Module IV
Components of a distribution system (no detailed design) - Head and Cross Regulator, Canal Falls, Canal Outlets, Cross Drainage Works, Canal Escapes - Surplusing arrangements in minor irrigation tanks.

Examination Scheme:

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Texts & References:

GEOINFORMATICS

Course Code: BTV 404 Credit Units: 03

Course Objective:
Geoinformatics is an important data system for all civil engineering activities including construction of structures, dams, water systems etc. Correct and reliable information and geographical data are a requirement today. The course thus addresses this issue.

Course Contents:

Module I
Triangulation - principle - reconnaissance - selection of site for baseline - selection of stations - orders of triangulation - triangulation figures - scaffolds and signals - marking of stations - intervisibility and heights of stations - satellite stations - baseline measurement - equipment and corrections - adjustment of observations.

Module II

Module III

Module IV

Examination Scheme:

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Texts & References:
FUNCTIONAL DESIGN OF BUILDING

Course Code: BTV 405                Credit Units: 03

Course Objective:
Modern buildings are not mere load bearing structures. They have to be provided with all facilities and amenities for the purposes for which they are meant, be it office space, residential building, warehouses or large shopping malls. Consideration of comfort and functional requirements are significant and energy efficiency is now a critical factors. The course exposes the students these aspects of modern building design and construction.

Course Contents:

Module I: Building Physics
Climate: Global climatic factors – Elements of climate – Data and measurement of elements of climate – Graphical representation methods - Site climate - Classification of climates.
Thermal comfort: Thermal balance of human body - Subjective variables - Thermal comfort indices and uses - Comfort zone.
Thermo-physical properties of building materials: Thermal quantities and their units - Periodic heat flow and its characteristics - Heat flow calculations.
Sun's movement and building: Solar temperature concept - Solar gain factor – Apparent movement of sun - Solar charts and its use - Sun control devices – External shading devices, Internal blinds and curtains and Special glasses
Heat flow and thermal insulation
Heat flow through buildings - Thermal gradient; Insulating materials - Properties – Thermal insulation of roofs, Exposed walls and Openings

Module II: Building services
Vertical transportation: Stairs - Types and design considerations; Elevators - Types and design considerations; Escalators - features, operation & arrangement; Ramps.
Ventilation and air conditioning: Ventilation requirements - Natural and mechanical ventilation; Air conditioning - Heat exchange of building - Calculation of air conditioning load - Summer and winter air conditioning - Parts and operation of a/c plant - Systems of air conditioning.
Plumbing services: Typical details of water supply and sewage disposal arrangements for buildings - Standard requirements.

Module III: Lighting
Acoustics
Properties of sound - Frequency - Pitch - Intensity - Power- Pressure - Loudness – Decibel scale; Room acoustics - Reverberation - Sabine's formula - Acoustical defects – Sound absorbing materials and constructions; Requirements for good acoustics - General principles of acoustic design; Sound insulation -Transmission loss – Methods of sound insulation construction of walls, floors and roofs.

Module IV: Environment
Introduction to environment – site and built up space relationships – Design as a human activity – principles of architectural design.

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Texts & References:

TRANSPORTATION ENGINEERING - I

Course Code: BTV 406  Credit Units: 03

Course Objective:
Modern road design and construction are covered in the syllabus.

Course Contents:

Module I: Highway Classification, Alignment and Geometrical Design
Introduction – Highway development in India - Classification of roads - Typical cross sections of roads in urban and rural area - Requirements and factors controlling alignment of roads - Engineering surveys for highway location - Pavement surface characteristics - Camber and width requirements – Sight distances - stopping and overtaking sight distances, overtaking zone requirements - Design of horizontal alignment - speed, radius, super elevation, methods of providing super elevation, extra widening of pavements, transition curves - Design of vertical alignment - gradient, grade compensation, summit curves and valley curves - worked out problems on all the above topics.

Module II: Traffic engineering
Introduction - Road user, vehicle and traffic characteristics - Speed and volume studies - Simple worked out problems - Principles of design of at-grade intersections -Simple layouts - Objectives, classification and uses of traffic signs and markings - Design of isolated signals by Webster's method.

Module III: Pavement Materials and Design
Desirable properties and testing of highway materials: road aggregates, bituminous materials and subgrade soil - Factors influencing the design of pavements - CBR method and IRC guidelines of flexible pavements design - Design of rigid pavements using IRC charts - worked out problems.

Module IV: Pavement Construction and Maintenance
Historical development of road construction -Construction of earth roads, WBM roads, stabilized roads, bituminous pavements, cement concrete roads and joints in cement concrete roads - Types and causes of failures in flexible & rigid pavements.

Examination Scheme:

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Text & References:
NUMERICAL ANALYSIS LAB - I

Course Code: BTV 420  
Credit Units: 01

Course Contents:

Assignments will be provided for the following:

- Analysis of various numerical and statistical techniques

Examination Scheme:

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

Course Code: BTV 421
Credit Units: 01

Course Contents:

List of Exercises:

1. Tests on aggregate for concrete
   (a) Grain size distribution (b) Specific gravity (c) Density (d) Voids (e) Bulking (f) Aggregate crushing value (g) Aggregate impact value.

2. Tests on cement
   (a) Fineness (b) Normal consistency (c) Setting time (d) Compressive strength

3. Test on Timber beam – Bending test

4. Tests on tiles – Dimension, Transverse Strength, Water Absorption and Crazing

5. Tests on bricks – Crushing strength, water absorption and efflorescence

6. Tests on metals – Hardness test and impact test

Examination Scheme:

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

Course Code: BTV 422
Credit Units: 01

Course Contents:

List of Exercises:

1. Determination of tacheometric constants.
2. Heights and distances by stadia tacheometry.
3. Heights and distances by tangential tacheometry.
4. Heights and distances by solution of triangles.
5. Setting out of simple curves – linear methods.
7. Setting out of transition curve.
8. Permanent adjustments of theodolite.
9. Heights and distances by using subtense bar.
10. Study of modern instruments – Automatic levels and Total station.

Examination Scheme:

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

Course Code: BTV 441  Credit Units: 01

Course Objective:
To teach the participants strategies for improving academic reading and writing. Emphasis is placed on increasing fluency, deepening vocabulary, and refining academic language proficiency.

Course Contents:

Module I: Social Communication Skills
Small Talk
Conversational English
Appropriateness
Building rapport

Module II: Context Based Speaking
In general situations
In specific professional situations
Discussion and associated vocabulary
Simulations/Role Play

Module III: Professional Skills
Presentations
Negotiations
Meetings
Telephony Skills

Examination Scheme:

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

Text & References:

- Essential Telephoning in English, Garside/Garside, Cambridge
- Working in English, Jones, Cambridge
- Business Communication, Raman – Prakash, Oxford
- Speaking Personally, Porter-Ladousse, Cambridge
- Speaking Effectively, Jermy Comfort, et.al, Cambridge
- Business Communication, Raman – Prakash, Oxford
BEHAVIOURAL SCIENCE - IV
(RELATIONSHIP MANAGEMENT)

Course Code: BTV 443                          Credit Units: 01

Course Objective:
To understand the basis of interpersonal relationship
To understand various communication style
To learn the strategies for effective interpersonal relationship

Course Contents:

Module I: Understanding Relationships
Importance of relationships
Role and relationships
Maintaining healthy relationships

Module II: Bridging Individual Differences
Understanding individual differences
Bridging differences in Interpersonal Relationship – TA
Communication Styles

Module III: Interpersonal Relationship Development
Importance of Interpersonal Relationships
Interpersonal Relationships Skills
Types of Interpersonal Relationships

Module IV: Theories of Interpersonal Relationships
Theories: Social Exchange, Uncertainty Reduction Theory
Factors Affecting Interpersonal Relationships
Improving Interpersonal Relationships

Module V: Impression Management
Meaning & Components of Impression Management
Impression Management Techniques (Influencing Skills)
Impression Management Training-Self help and Formal approaches

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
- Foster John, Effective Writing Skills: Volume-7, First Edition 2000, Institute of Public Relations (IPR)
- Beebe, Beebe and Redmond; Interpersonal Communication, 1996; Allyn and Bacon Publishers.
Course Code: BTV 444  Credit Units: 02

Course Objective:
To enable students:
• To develop strategies of comprehension of texts of different origin
• To present facts, projects, plans with precision

Course Contents:

Module C: pp. 104 – 139: Unités 8, 9

Contenu lexical:  
Unité 8: Découvrir le passé
1. parler du passé, des habitudes et des changements.
2. parler de la famille, raconter une suite d’événements/préciser leur date et leur durée.
3. connaître quelques moments de l’histoire

Unité 9: Entreprendre
1. faire un projet de la réalisation: (exprimer un besoin, préciser les étapes d’une réalisation)
2. parler d’une entreprise
3. parler du futur

Contenu grammatical:  
1. Imparfait
2. Pronom « en »
3. Futur
4. Discours rapporté au présent
5. Passé récent
6. Présent progressif

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
• le livre à suivre: Campus: Tome 1
GERMAN - IV

Course Code: BTV 445  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 Advanced Grammar Language and Professional Jargon

Course Contents:

Module I: Present perfect tense
Present perfect tense, usage and applicability
Usage of this tense to indicate near past
Universal applicability of this tense in German

Module II: Letter writing
To acquaint the students with the form of writing informal letters.

Module III: Interchanging prepositions
Usage of prepositions with both accusative and dative cases
Usage of verbs fixed with prepositions
Emphasizing on the action and position factor

Module IV: Past tense
Introduction to simple past tense
Learning the verb forms in past tense
Making a list of all verbs in the past tense and the participle forms

Module V: Reading a Fairy Tale
Comprehension and narration
  • Rotkäppchen
  • Froschprinzessin
  • Die Fremdsprache

Module VI: Genitive case
Genitive case – Explain the concept of possession in genitive
Mentioning the structure of weak nouns

Module VII: Genitive prepositions
Discuss the genitive prepositions and their usage: (während, wegen, statt, trotz)

Module VIII: Picture Description
Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

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, Schmoe, Deutsch als Fremdsprache 1A, Grundkurs
SPANISH - IV

Course Code: BTV 446 Credit Units: 02

Course Objective:
To enable students acquire working knowledge of the language; to give them vocabulary, grammar, voice modulations/intonations to handle everyday Spanish situations with ease.

Course Contents:

Module I
Revision of earlier semester modules
Introduction to Present Continuous Tense (Gerunds)

Module II
Translation with Present Continuous Tense
Introduction to Gustar, Parecer, Apetecer, doler

Module III
Imperatives (positive and negative commands of regular verbs)

Module IV
Commercial/business vocabulary

Module V
Simple conversation with help of texts and vocabulary
En la recepcion del hotel
En el restaurante
En la agencia de viajes
En la tienda/supermercado

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español Sin Fronteras (Nivel – Elemental)
Course Code: BTV 447
Credit Units: 02

Course Objective:
To enable the students to comfortably interact using basic Japanese.
Note: Teaching is done in roman as well as Japanese script, students will be taught katankana (another form of script) in this semester i.e. to be able to write all the foreign words in Japanese.

Course Contents:

Module I
Comparison using adjectives, making requests

Module II
Seeking permission

Module III
Practice of conversations on:
Visiting people, Party, Meetings, after work, at a ticket vending machine etc

Module IV
Essays, writing formal letters

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

Methods of Private study /Self help
➢ Handouts, audio-aids, and self-do assignments, role-plays.
➢ Students are also encouraged to attend Japanese film festival and other such fairs and workshops organized in the capital from time to time.

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: BTV 448
Credit Units: 02

Course Objective:
How many characters are there? The early Qing dynasty dictionary included nearly 50,000 characters the vast majority of which were rare accumulated characters over the centuries. An educate person in China can probably recognize around 6000 characters. 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
Dialogue Practice
Observe picture and answer the question
Pronunciation and intonation
Character writing and stroke order.
Electronic items

Module II
Traveling – The Scenery is very beautiful
Weather and climate
Grammar question with – “bu shi …. Ma?”
The construction “yao … le” (Used to indicate that an action is going to take place)
Time words “yiqian”, “yiwi” (Before and after).
The adverb “geng”.

Module III
Going to a friend house for a visit meeting his family and talking about their customs.
Fallen sick and going to the Doctor, the doctor examines, takes temperature and writes prescription.
Aspect particle “guo” shows that an action has happened some time in the past.
Progressive aspect of an action “zhengzai” Also the use if “zhe” with it.
To welcome someone and to see off someone …. I cant go the airport to see you off… etc.

Module IV
Shipment. Is this the place to checking luggage?
Basic dialogue on – Where do u work?
Basic dialogue on – This is my address
Basic dialogue on – I understand Chinese
Basic dialogue on – What job do u do?
Basic dialogue on – What time is it now?

Module V
Basic dialogue on – What day (date) is it today?
Basic dialogue on – What is the weather like here.
Basic dialogue on – Do u like Chinese food?
Basic dialogue on – I am planning to go to China.

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- “Elementary Chinese Reader, Part-2” Lesson 31-38
Course Objective:
The course builds upon the earlier course of Structural Analysis I and deals with more advanced methods.

Course Contents:

Module I: Force method of analysis of indeterminate structures
Analysis of rigid frames of different geometry by consistent deformation method – settlement effects - analysis of pin-jointed trusses by consistent deformation method - externally and internally redundant trusses - effects of settlement and prestrains.

Module II: Displacement method of analysis of indeterminate structures
Slope deflection method - analysis of continuous beams - beams with overhang - analysis of rigid frames - frames with sloping legs - gabled frames - frames without sway and with sway - settlement effects - moment distribution method as successive approximation of slope deflection equations - analysis of beams and frames - non-sway and sway analyses - Kani’s method as iterative method of analysis of frames (outline only).

Module III: Moving Loads & Influence Lines
Introduction to moving loads - concept of influence lines - influence lines for reaction, shear force and bending moment in simply supported beams - influence lines for forces in trusses – analysis for different types of moving loads - single concentrated load - several concentrated loads - uniformly distributed load shorter and longer than the span.

Module IV: Cables, suspension bridges and arches
Analysis of forces in cables - suspension bridges with three-hinged and two-hinged stiffening girders - theory of arches - Eddy’s theorem - analysis of three-hinged and two-hinged arches - settlement and temperature effects.

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:

- Reddy C.S., Basic Structural Analysis, Tata McGraw Hill
- Rajasekaran S. & Sankarasubramanian G., Computational Structural Mechanics, PHI
PRINCIPLES OF STRUCTURAL DESIGN

Course Code: BTV 501  Credit Units: 04

Course Objective:
Based on the course Structural Analysis the student should be able to start design of structures using various types of materials.

Course Contents:

Module I: Design Philosophy

Module II: Reinforced Concrete

Module III: Steel
Steel - introduction to connections - analysis and design of riveted, bolted and welded joints for direct force and moment - struts and ties made of single and double angles. 
A design project involving the design and detailing of a typical connection is envisaged at this stage.

Module IV: Timber
Classification and allowable stresses - design of beams for flexure, shear & bearing – deflection criteria - design of solid and built-up columns – flitched beam – formwork design. 
A design project involving the design and specification of the formwork for a typical concrete structure is envisaged at this stage.

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:

- Shetty M.S., Concrete Technology, S. Chand, 1988.
- Punmia B.C., Reinforced Concrete Structures Vol. I, Standard Book House, 2005
- BIS Codes (IS 875, IS 10262, SP 23, IS 456, IS 800, SP 6, IS 883, IS 2750).
GEOTECHNICAL ENGINEERING - I

Course Code: BTV 503  Credit Units: 03

Course Objective:
Soil mechanics and related topics are important areas in Civil Engineering and the first part of Geotechnical Engineering deals with soils and their characteristics.

Course contents:

Module I: Nature of soil and functional relationships
Soil type - Concepts of single grained, honey combed and flocculent structure and their effects on the basic soil properties - 3 phase system - void ratio - specific gravity - dry density - porosity - water content - saturated unit weight - submerged unit weight - degree of saturation. Laboratory and field identification of soils: Determination of water content by oven drying - Specific gravity using pycnometer and specific gravity bottle - Grain size analysis by sieve analysis, hydrometer analysis and pipette analysis - Atterberg limits and indices – Visual identification by simple field tests - Field density by core cutter, sand replacement and wax coating methods. Classification of soils: Necessity - Principles of classification - I.S. classification – Plasticity charts - Group index.

Module II: Soil Water, Permeability and Stress Distribution

Module III: Consolidation and Compation
Consolidation: Definition - Concepts of coefficient of compressibility - Coefficient of volume change and compression index - e-log p curves - Terzaghi’S theory of one dimensional consolidation – Determination of coefficient of consolidation- pre-consolidation pressure difference between consolidation and compaction. Compaction: Definition and objectives of compaction - Proctor test and modified proctor test - Concept of OMC and maximum dry density - Zero air voids line - Factors influencing compaction - Effect of compaction on soil properties - Field compaction methods - Proctor needle for field control.

Module IV: Shear Strength and Stability of Slopes

Examination Scheme:

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Text & References:
- Khan I.H., Text Book of Geotechnical Engineering, Prentice Hall of India
Course Objective:
This course deals with the design concept of railways, airport and tunnel.

Course Contents:

Module I: Components & Geometric Design of Railways

Module II: Railway Operation and Control

Module III: Tunneling

Module IV: Airport planning and Design

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:

- Agarwal M.M., Railway Engineering, Prabha and Co
- Horonjeff R., Planning and Design of Airports, Mc Graw Hill
HYDRAULIC MACHINES
(Ref. Fluid Power Systems of B.Tech MAE)

Course Code: BTV 505  Credit Units: 03

Course Objective:
Fluid power systems cover generation, transmission, and control applications of power by using pressurized fluids. This course imparts the knowledge of different fluid power systems which are used in industries and hydropower plants.

Course Contents:

Module I: Introduction
Euler’s equations for turbo machines; impulse and reaction forces due to fluid systems on stationery and moving system of vanes; jet propulsion.

Module II: Water Turbines
Classification: Pelton, Francis, Propeller and Kaplan turbines; velocity triangles; efficiency; draft tubes, governing.

Module III: Pumps
Centrifugal pumps, velocity triangles, efficiency, turbine pumps, axial and mixed flow pumps.

Module IV: Performance of Fluid Machines
Similarity laws applied to rotodynamic machines; specific speed, unit quantities; characteristic curves; use of models; cavitations and attendant problems in turbo machines; selection of turbines hydroelectric plants.

Module V: Hydraulic Power Transmission
Transmission of hydraulic power through pipe lines; water hammer; precautions against water hammer in turbine and pump installations; hydraulic ram.

Module VI: Power Hydraulics
Positive pumps: gear, vane, screw, pump, variable delivery valves: flow control, pressure control, direction control, solenoid operated valve, hydraulic circuits, fluid coupling and torque converter.
Pneumatic Power: Basic principles, comparison of pneumatic and hydraulic Systems.

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:

Text:

References:
MATERIAL TESTING LAB – II

Course Code: BTV 520

Credit Units: 01

List of Exercises

1. Tension test on MS rod.
2. Shear Test on MS rod.
3. Torsion test on MS Specimen.
5. Spring test – open and close coil springs.
7. Compression test on cubes and cylinders – determination of modulus of elasticity.
8. Split test on concrete cylinders and flexure test on concrete.
9. Study of extensometers and strain gauges.

Examination Scheme:

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

Course Code: BTV 521 Credit Units: 01

Name of Experiments

1. To conduct a test on Centrifugal Pump and plot its characteristics.
2. To Plot the characteristics of Pelton turbine.
3. To conduct an experiment on Francis turbine.
4. To study the effect of a draft tube on reaction turbines.
5. To find the friction factor for flow through pipes.
6. To study the hydraulic controls rig.
7. To conduct an experiment for verifying model laws.
8. To study the cavitations phenomenon in turbines.
9. Study of hydraulic couplings and torque converters.

Examination Scheme:

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

Course Code: BTV 541 Credit Units: 01

Course Objective:
To equip the participant with linguistic skills required in the field of science and technology while guiding them to excel in their academic field.

Course Contents:

Module I  
Reading Comprehension  
Summarising  
Paraphrasing

Module II  
Essay Writing  
Dialogue Report

Module III  
Writing Emails  
Brochure  
Leaflets

Module IV: Introduction to Phonetics  
Vowels  
Consonants  
Accent and Rhythm  
Accent Neutralization  
Spoken English and Listening Practice

Examination Scheme:

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

Text & References:
- Effective English for Engineering Students, B Cauveri, Macmillan India  
- Creative English for Communication, Krishnaswamy N, Macmillan  
- A Textbook of English Phonetics, Balasubramanian T, Macmillan
BEHAVIOURAL SCIENCE - V
(GROUP DYNAMICS AND TEAM BUILDING)

Course Code: BTV 543
Credit Units: 01

Course Objective:
To inculcate in the students an elementary level of understanding of group/team functions.
To develop team spirit and to know the importance of working in teams.

Course Contents:

Module I: Group formation
Definition and Characteristics
Importance of groups
Classification of groups
Stages of group formation
Benefits of group formation

Module II: Group Functions
External Conditions affecting group functioning: Authority, Structure, Org. Resources, Organizational policies etc.
Internal conditions affecting group functioning: Roles, Norms, Conformity, Status, Cohesiveness, Size, Inter group conflict.
Group Cohesiveness and Group Conflict
Adjustment in Groups

Module III: Teams
Meaning and nature of teams
External and internal factors effecting team
Building Effective Teams
Consensus Building
Collaboration

Module IV: Leadership
Meaning, Nature and Functions
Self leadership
Leadership styles in organization
Leadership in Teams

Module V: Power to empower: Individual and Teams
Meaning and Nature
Types of power
Relevance in organization and Society

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:

- Organizational Behaviour, Davis, K.
- Dressers, David and Cans, Donald: The Study of Human Interaction.
- LaFasto and Larson: When Teams Work Best, 2001, Response Books (Sage), New Delhi
FRENCH - V

Course Code: BTV 544 Credit Units: 02

Course Objective:
To furnish some basic knowledge of French culture and civilization for understanding an authentic document and information relating to political and administrative life

Course Contents:

Module D: pp. 131 – 156 Unités 10, 11

Contenu lexical:

Unité 10: Prendre des décisions
1. faire des comparaisons
2. décrire un lieu, le temps, les gens, l'ambiance
3. rédiger une carte postale

Unité 11: faire face aux problèmes
1. Exposer un problème.
2. parler de la santé, de la maladie
3. interdire/demander/donner une autorisation
4. connaître la vie politique française

Contenu grammatical:

1. comparatif - comparer des qualités/quantités/actions
2. supposition: Si + présent, futur
3. adverbe - caractériser une action
4. pronom "y"

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1
Course Code: BTV 545  
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 Advanced Grammar and Business Language and Professional Jargon.

Course Contents:

Module I: Genitive case
Genitive case – Explain the concept of possession in genitive
Mentioning the structure of weak nouns

Module II: Genitive prepositions
Discuss the genitive propositions and their usage: (während, wegen, statt, trotz)

Module III: Reflexive verbs
Verbs with accusative case
Verbs with dative case
Difference in usage in the two cases

Module IV: Verbs with fixed prepositions
Verbs with accusative case
Verbs with dative case
Difference in the usage of the two cases

Module V: Texts
A poem ‘Maxi’
A text Rocko

Module VI: Picture Description
Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

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C – Project + Presentation  
I – Interaction/Conversation Practice

Text & References:

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- 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 - V

Course Code: BTV 546  Credit Units: 02

Course Objective:
To enable students acquire working knowledge of the language; to give them vocabulary, grammar, voice modulations/intonations to handle everyday Spanish situations with ease.

Course Contents:

Module I
Revision of earlier semester modules

Module II
Future Tense

Module III
Presentations in English on
Spanish speaking countries’
Culture
Sports
Food
People
Politics
Society
Geography

Module IV
Situations:
En el hospital
En la comisaria
En la estacion de autobus/tren
En el banco/cambio

Module V
General revision of Spanish language learnt so far.

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español Sin Fronteras, Greenfield
Course Code: BTV 547  
Credit Units: 02

Course Objective:
To enable the students to converse, read and write language comfortably and be able to converse using different patterns and forms taught throughout. Students are taught and trained enough to get placed themselves in Japanese companies.

Note: Teaching is done in roman as well as Japanese script.

Course Contents:

Module I
Dictionary form of the verbs, Joining of verbs
Negative form of verbs
Potential form

Module II
Joining of many actions together
Usage of dictionary form of the verbs in sentences
Introducing colloquial language.

Module III
Direct form of the speech, quotations,
Expressing thoughts
Actions and reasoning

Module IV
Conclusion
Receiving and giving things, favour etc.
Different forms like ‘tara’ form.

Module V
Revision of the whole syllabus

Learning Outcome
➢ Students can speak and use different patterns, ways to describe a particular situation and can converse comfortably in mentioned situations throughout.
➢ Students can appear in the interviews for placements in Japanese companies.

Methods of Private study /Self help
➢ Teaching will be supported by handouts, audio-aids, and self-do assignments and role plays.
➢ 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: BTV 548  Credit Units: 02

Course Objective:
What English words come from Chinese? Some of the more common English words with Chinese roots are: ginseng, silk, dim sum, fengshui, typhoon, yin and yang, T’ai chi, kung-fu. 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.
Pronunciation and intonation.
Character writing and stroke order

Module II
Intonation
Chinese foods and tastes – tofu, chowmian, noodle, Beijing duck, rice, sweet, sour…etc. Learning to say phrases like – Chinese food, Western food, delicious, hot and spicy, sour, salty, tasteless, tender, nutritious, god for health, fish, shrimps, vegetables, cholesterol is not high, pizza, milk, vitamins, to be able to cook, to be used to, cook well, once a week, once a month, once a year, twice a week……
Repetition of the grammar and verbs taught in the previous module and making dialogues using it.
Compliment of degree “de”.

Module III
Grammar the complex sentence “suiran … danshi….”
Comparison – It is colder today than it was yesterday…..etc.
The Expression “chule….yiwai”. (Besides)
Names of different animals.
Talking about Great Wall of China
Short stories

Module IV
Use of “huozhe” and “haishi”
Is he/she married?
Going for a film with a friend.
Having a meal at the restaurant and ordering a meal.

Module V
Shopping – Talking about a thing you have bought, how much money you spent on it? How many kinds were there? What did you think of others?
Talking about a day in your life using compliment of degree “de”. When you get up? When do you go for class?
Do you sleep early or late? How is Chinese? Do you enjoy your life in the hostel?
Making up a dialogue by asking question on the year, month, day and the days of the week and answer them.

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- “Elementary Chinese Reader” Part-II Lesson 39-46
ENVIRONMENTAL ENGINEERING - I

Course Code: BTV 601  Credit Units: 03

Course Objective:
Based on course Environmental studies, the water resources and their management for environmental suitability are studied in this course.

Course Contents:

Module I: Scope of Environmental Engineering

Module II: Sources of water

Module III: Treatment of water

Module IV: Water supply schemes

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:

- Relevant BIS Codes.
STRUCTURAL CONCRETE DESIGN

Course Code: BTV 602  Credit Units: 03

Course Objective:
This course deals with the design concept of designing concrete structure. As a prerequisite the students should have knowledge of principal of structural design.

Course Contents:

Module I: Introduction to limit state method of design
Limit State of Collapse: Flexure. Limit state of collapse for flexure as per IS. Assumptions. Moment capacity of rectangular and flanged sections. Singly and doubly reinforced sections. Design tables and charts. Critical sections for bending in important structural elements such as slabs, beams, retaining wall, footings, staircase etc. Design project for the design and detailing of a floor slab system and staircase of a residence (load bearing masonry walls).

Module II: Shear and Torsion
Limit State of Collapse: Shear. Nominal shear stress. Design shear strength of concrete. Design of shear reinforcement. Use of SP16 for shear design. Critical sections for shear in important structural elements such as slabs, beams, retaining walls, footings etc. Design project for the design and detailing the beams of a framed system.

Module III: Compression
Limit State of Collapse: Compression. Analysis and design of columns of rectangular and circular cross sections. Axially loaded columns. Columns with uniaxial and biaxial eccentricity using SP 16 design charts. Short and slender columns. Design project for the design and detailing the columns of a framed system and isolated and combined footings.

Module IV: Limit State of Serviceability

Examination Scheme:

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Text & References:

- Punmia B.C., Reinforced Concrete Structures Vol. I, Standard Book House, 2005
- Jain & Jaikrishna, Plain & Reinforced Concrete Vol. I, Nemchand, 2000
- Sinha S.N., Reinforced Concrete Design, Tata McGraw Hill, 2005
- BIS codes (IS 456, SP 16, SP 24, SP 34)
GEOTECHNICAL ENGINEERING - II

Course Code: BTV 603  Credit Units: 04

Course Objective:
Advanced topics of soil mechanics and the design of foundations are covered in this course.

Course Contents:

Module I: Earth pressure
Earth pressure at rest. Active and passive earth pressure for cohesionless and cohesive soils. Coulomb’s and Rankine’s theories. Point of application of earth pressure for cases of with and without surcharge in cohesionless and cohesive soils. Culmann’s and Rebhan’s graphical construction for active earth pressure. Friction circle method for active earth pressure.  

Module II: Bearing capacity


Module III: Foundations


Module IV: Pile foundations

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:

- Teng W.C., Foundation Design, PHI, 1984
- Terzaghi & Peck, Soil Mechanics in Engineering Practice, Asia Publishing
- Murthy V.N.S., Soil Mechanics & Foundations.
COMPUTER APPLICATION IN CIVIL ENGINEERING

Course Code: BTV 604 Credit Units: 03

Course Objective:
Application of the course on Numerical Analysis & Programming and use of linear and non-linear programming are given in this course.

Course Contents:

Module I: Overview of Numerical Methods

Module II: Application of Eigenvalue Problems and Interpolations to Civil Engineering
Eigen Value Problems: determination of eigen values and eigen vectors by Power method and Jacobi’s method. Interpolation: Newton’s formulae - Gauss’ formulae - Lagrangian interpolation – Cubic spline interpolation. Applications in Civil Engineering Problems

Module III: Numerical differentiation and integration
Numerical differentiation using Newton’s formula - maximum and minimum values of tabulated functions - numerical integration -trapezoidal formula - Simpson’s formulae and Gauss quadrature - development of computer algorithms for numerical integration. Numerical solution of ordinary differential equations. Applications in Civil Engineering Problems

Module IV: Linear and Non-Linear Programming Problems

Examination Scheme:

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Text & References:
- Scarborough J.B., Numerical Mathematical Analysis, Oxford & IBH
Course Objective:
Types of concrete and their manufacture and applications are covered in this course.

Course Contents:

Module I: Materials
Materials: cement - different types - chemical composition and physical properties - tests on cement - I.S. specifications - aggregates - classification - mechanical properties and tests as per I.S. - alkali aggregate reaction - grading requirements - heavy weight - light weight - normal weight - aggregate - sampling of aggregate - water - quality of water - permissible impurities as per I.S. - admixtures - accelerators - retarders - water reducing agents - super plasticizers - use of silica fumes.

Module II: Manufacture

Module III: Properties of Concrete

Module IV: Special Concretes

Examination Scheme:

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Text & References:
- Neville A.M., Properties of Concrete, Pitman
- John. H. Bungey, The Testing of Concrete in Structures, Urrey University of Press Hall
BUILDING DESIGN AND DRAWING

Course Code: BTV 606  Credit Units: 04

Course Objective:
The objective of the course is to develop the capability for carrying out independent design. Information in the form of sketch and images to be illustrated as a part of discussion.

Course Contents:

PART A: PLANNING

Module I: Function, Structure and Appearance
Evolution of architectural styles. Roman, Greek, Medieval and Modern architecture. Examples.

Module II: Creative principles

Module III: Functional factors
Lighting, ventilation, thermal and acoustics factors and their effects on architectural form.

Module IV: Spaces
Space planning of buildings such as residential, public and commercial. Design process. Activity areas and linkages. Proximity matrix. Adjacency diagram. Form development with respect to site conditions and functional requirements. Preparation of drawings. Elementary perspective and rendering.

PART B: DRAWING

Planning, designing from given requirements of areas and specifications and preparation of sketch design and working drawings for:
1. Residential building- flat and pitched roof, economic domestic units, cottages, bungalows and building flats.
2. Public building – small public utility shelters, dispensaries, banks, schools, offices, libraries, hostels, restaurants, commercial complexes, factories etc.
3. Preparation of site plans and service plans as per Building Rules
5. Plumbing, water supply and drainage for buildings.

Examination Scheme:

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Text & References:

- SP 7:2005, National Building Code of India
- Local Building Bye-laws
- Chiara, Callender, John Hancock, Time Saver Standards for Building Type, McGraw Hill
- Chiara, Joseph De, Time Saver Standards for Site Planning, McGraw Hill
- Scott, Robert Gillan, Design Fundamentals, Mc-Graw Hill.
- Balagopal T S Prabhu, Building Drawing and Detailing, Spades Publishers
COMPUTER APPLICATIONS LAB

Course Code: BTV 620
Credit Units: 01

Course Objective:
To familiarize and give hands on training to students in the following areas of Civil Engineering Application software.

Course Contents:
1. Drafting and documentation.
2. Surveying – terrain mapping, computation of areas & volumes.
4. Water resources
5. Geotechnical Engineering
6. Road/Railway system
7. Environmental Engineering
8. Estimation and costing
9. Project management

Examination Scheme:

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

Course Code: BTV 621  Credit Units: 01

Course Contents:

1. Specific gravity of coarse and fine grained soils.
2. Grain size analysis (a) Sieve analysis (b) Pipette analysis
3. Atterberg’s limits and indices
4. Determination of field density (a) sand replacement method (b) core cutter method
5. Determination of coefficient of permeability by
   (a) Constant head method (b) Variable head method
6. Consolidation test
7. Compaction test (a) IS light compaction test (b) IS heavy compaction test
8. California Bearing Ratio test
9. Direct shear test
10. Triaxial shear test
11. Unconfined compressive strength test
12. Laboratory vane shear test

Examination Scheme:

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

Course Code: BTV 641 Credit Units: 01

Course Objective:
To enhance the skills needed to work in an English-speaking global business environment.

Course Contents:

Module I: Business/Technical Language Development
Advanced Grammar: Syntax, Tenses, Voices
Advanced Vocabulary skills: Jargons, Terminology, Colloquialism
Individualised pronunciation practice

Module II: Social Communication
Building relationships through Communication
Communication, Culture and Context
Entertainment and Communication
Informal business/ Technical Communication

Module III: Business Communication
Reading Business/ Technical press
Listening to Business/ Technical reports (TV, radio)
Researching for Business /Technology

Module IV: Presentations
Planning and getting started
Design and layout of presentation
Information Packaging
Making the Presentation

Examination Scheme:

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

Text & References:

- Business Vocabulary in Use: Advanced Mascull, Cambridge
- Business Communication, Raman – Prakash, Oxford
- Business Communications, Rodgers, Cambridge
- Working in English, Jones, Cambridge
- New International Business English, Jones/Alexander, Cambridge
Course Objective:
To develop an understanding the concept of stress its causes, symptoms and consequences.
To develop an understanding the consequences of the stress on one’s wellness, health, and work performance.

Course Contents:

Module I: Stress
Meaning & Nature
Characteristics
Types of stress

Module II: Stages and Models of Stress
Stages of stress
The physiology of stress
Stimulus-oriented approach.
Response-oriented approach.
The transactional and interactional model.
Pressure – environment fit model of stress.

Module III: Causes and symptoms of stress
Personal
Organizational
Environmental

Module IV: Consequences of stress
Effect on behaviour and personality
Effect of stress on performance
Individual and Organizational consequences with special focus on health

Module V: Strategies for stress management
Importance of stress management
Healthy and Unhealthy strategies
Peer group and social support
Happiness and well-being

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:

- Blonna, Richard; Coping with Stress in a Changing World: Second edition
- Pestonjee, D.M, Pareek, Udai, Agarwal Rita; Studies in Stress And its Management
- Pestonjee, D.M.; Stress and Coping: The Indian Experience
- Clegg, Brian; Instant Stress Management – Bring calm to your life now
Course Code: BTV 644  
Credit Units: 02

Course Objective:
To strengthen the language of the students both in oral and written so that they can:

i) express their sentiments, emotions and opinions, reacting to information, situations;

ii) narrate incidents, events;

iii) perform certain simple communicative tasks.

Course Contents:

Module D: pp. 157 – 168 – Unité 12

Unité 12: s'évader
1. présenter, caractériser, définir
2. parler de livres, de lectures
3. préparer et organiser un voyage
4. exprimer des sentiments et des opinions
5. téléphoner
6. faire une réservation

Contenu grammatical:
1. proposition relative avec pronom relatif "qui", "que", "où" - pour caractériser
2. faire + verbe

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1
GERMAN - VI

Course Code: BTV 645 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 Advanced Grammar and Business Language and Professional Jargon

Course Contents:

Module I: Adjective endings
Adjective endings in all the four cases discussed so far
Definite and indefinite articles
Cases without article

Module II: Comparative adverbs
Comparative adverbs as and like

Module III: Compound words
To learn the structure of compound words and the correct article which they take
Exploring the possibility of compound words in German

Module IV: Infinitive sentence
Special usage of ‘to’ sentences called zu+ infinitive sentences

Module V: Texts
A Dialogue: ‘Ein schwieriger Gast’
A text: ‘Abgeschlossene Vergangenheit’

Module VI: Comprehension texts
Reading and comprehending various texts to consolidate the usage of the constructions learnt so far in this semester.

Module VII: Picture Description
Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

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
Course Code: BTV 646  Credit Units: 02

Course Objective:
To enable students acquire working knowledge of the language; to give them vocabulary, grammar, voice modulations/intonations to handle everyday Spanish situations in Present as well as in Present Perfect Tense with ease.

Course Contents:

Module I
Revision of the earlier modules

Module II
Present Perfect Tense

Module III
Commands of irregular verbs

Module IV
Expressions with Tener que and Hay que

Module V
En la embajada
Emergency situations like fire, illness, accident, theft

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras
Course Objective:
To enable the students to converse in the language with the help of verbs and the usage of different sentence patterns, which help them to strengthen the language.
Students are taught and trained enough to get placed in Japanese companies.
Note: The teaching is done in roman as well as Japanese script. 10 more kanjis are introduced in this semester.

Course Contents:

Module I: Polite form of verbs
Expressing feelings with the polite forms of verb.

Module II: Potential form
Ability of doing or not doing something

Module III: Conjunctions
Joining two sentences with the help of shi and mo

Module IV: Intransitive Verbs
Sentence patterns of indirect speech

Module V: Feelings and expressions
Regret, existence etc.

Learning Outcome
➢ Students can speak the language with the use of different forms of verb.

Methods of Private study/Self help
➢ Hand-outs, audio-aids, assignments and role-plays will support classroom teaching.
➢ Students are encouraged to watch Japanese movies at Japan Cultural and information center.

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Shin Nihon-go no Kiso Lesson No. 26 to 30.
- All vocabulary and topics taught are from the above-mentioned book.
Course Objective:
Chinese emperor Qin Shi Huang – Ti who built the great wall of China also built a network of 270 palaces, linked by tunnels, and was so afraid of assassination that he slept in a different palace each night. 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.
Pronunciation and intonation.
Character writing and stroke order.

Module II
Going out to see a science exhibition
Going to the theatre.
Train or Plane is behind schedule.
Indian Economy-Chinese Economy
Talking about different Seasons of the Year and Weather conditions. Learning to say phrases like -spring, summer, fall, winter, fairly hot, very cold, very humid, very stuffy, neither hot nor cold, most comfortable, pleasant .... etc.

Module III
Temperature – how to say – What is the temperature in May here?
– How is the weather in summer in your area?
– Around 30 degrees
– Heating, air-conditioning
– Is winter is Shanghai very cold?
Talking about birthdays and where you were born?
The verb “shuo” (speak) saying useful phrases like speak very well, do not speak very well, if speak slowly then understand if speak fast then don’t understand, difficult to speak, difficult to write, speak too fast, speak too slow, listen and can understand, listen and cannot understand … etc.
Tell the following in Chinese – My name is …. I was born in … (year). My birthday is …….. Today is … (date and day of the week). I go to work (school) everyday. I usually leave home at, (O’clock). In the evening, I usually ………. (do what)? At week end, I ………. On Sundays I usually ……………. It is today….. It will soon be my younger sisters birthday. She was born in ….. (year). She lives in ……. ….. (where). She is working (or studying)……. where… She lives in ……. (where.)

Examination Scheme:

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

Text & References:
• Elementary Chinese Reader Part-2, 3; Lesson 47-54
STRUCTURAL STEEL DESIGN

Course Code: BTV 701
Credit Units: 04

Course Objective:
This course deals with design of various steel structures. The prerequisite of this course is that the students should have good understanding of principles of structural design.

Course Contents:

Module I: Design of steel girders

Module II: Design of compression members
Axially and eccentrically loaded compression members - built up columns - lacings and battens - design of column bases.
A project involving the design and detailing of a Mill bent is envisaged at this stage.

Module III: Roof truss
Introduction to steel roof systems - design of roof trusses – design of roofing elements and purlin – wind bracings.
A project involving the design and detailing of a roof truss is envisaged at this stage.

Module IV: Plastic Analysis
Plastic theory: introduction - plastic hinge concept - plastic modulus - shape factor - redistribution of moments - collapse mechanism - plastic analysis of beams and portal frames by equilibrium and mechanism methods

Examination Scheme:

<table>
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<th>Components</th>
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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:

- P. Dayaratnam, Design of Steel Structures, (Wheeler), 1998
- M. Raghupathi, Design of Steel Structures, Tata McGraw Hill, 1985
- Lin & Breslar, Design of Steel Structures, John Wiley & Sons, 1963
- BIS codes (IS 800, SP: 6 – Part 1 to 6).
ENVIRONMENTAL ENGINEERING - II

Course Code: BTV 702

Credit Units: 03

Course Objective:
This course deals with advanced environmental engineering concepts. It explains the design of various plumbing, treatment plant and solid waste management.

Course Contents:

Module I

Module II

Module III
Anaerobic treatment- Anaerobic digesters- Septic Tanks- Soak pits
Waste water disposal – disposal into stream –fundamentals of stream sanitation- disposal by irrigation – sludge treatment and disposal

Module IV
Solid waste management: Generation- on site handling and storage- transfer and transportprocessing- resource recovery- treatment and disposal.
Air pollution and control – sources –pollutants and their health effects – particulate and gaseous pollution control devices (fundamentals)-Settling chambers- Electrostatic precipitators- Cyclones- Wet Collectors-Gas absorption by tray and packed towers

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:

- Duggal K.N., Elements of Environmental Engineering, S. Chand and Co. Ltd. (2000), New Delhi
WATER RESOURCES ENGINEERING

Course Code: BTV 703  Credit Units: 03

Course Objective:
This course deals with various concepts of water resources engineering. The course introduces the concept of hydrology, ground water and then deals with irrigation engineering. It also deals with design of dam.

Course Contents:

Module I: Hydrology

Module II: Irrigation
Necessity of irrigation and type of irrigation systems.-Total planning concept-Water requirements of crops-Command area-duty-delta. Consumptive use of water –Irrigation efficiency-Irrigation requirement of crops-Reservoir planning-Site investigation-Zones of storage-Reservoir yield-Reservoir losses and Control-Life of reservoir

Module III
Diversion head works-Location – Essential components of Weir and Barrage-Weirs on permeable foundations-Blighs and khoslas seepage theories - Design procedure.
Dams - Types of dams and their selection-Gravity dam-Analysis and design.
Spillways-Different types and suitability.

Module IV
Regulation and control of canal system-Purpose, Types of canal regulation works and their functional aspects. Irrigation Outlets-Requirements, types, non-modular, semi-module and rigid module, selection criterion. River Training - Objective and need, classification of rivers, and river training works, meandering, stages, methods of river training, bank protection, Methods for measurement of discharge.

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:

- Irrigation, Water Resources, and Water power Engineering By Dr P.N.Modi, Standard Book House 1990
- Engineering Hydrology by K. Subramanya, TMH.
- Water Resources Engg. By Larry W. Mays, John Wiley India
- Water resources Engg. By Wurbs and James, John wiley India
- Irrigation and water Resources Engg. By G L Asawa, New age International Publishers
- Irrigation Theory and practices by A.M. Michel.
- Irrigation and water Power engineering by B.C. Punmia, Laxmi Publications.
Course Code: BTV 720
Credit Units: 01

Course Contents:

1. Determination of solids (total, dissolved, organic, inorganic and settleable) in water
2. Determination of turbidity and the optimum coagulant dose
3. Determination of alkalinity and pH of water
4. Determination of hardness and chlorides in water
5. Determination of iron and manganese in water
6. Determination of sulphates and sulphides in water
7. Determination of D.O and B.O.D of waste water
8. Determination of available chlorine in bleaching powder and the chlorine dose required to treat the given water sample
9. Determination of coliforms in water
10. Demonstration of Instrumental methods of pollutant analysis

Examination Scheme:

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

Text & References:

- Standard method for the examination of water and waste water, 2005, APHA, AWWA, WPCF Publication
Course Code: BTV 721  Credit Units: 01

Course Contents:

Preparation of working drawings for the following using any drafting software:

RC Beams - Simply supported, Continuous, Cantilever

T – beam / L-beam floor

Slabs – Simply supported, Continuous, One way and two way slabs.

Columns – Tied Columns and Spirally reinforced columns.

Isolated footings for RC Columns.

Combined rectangular and trapezoidal footings.

Examination Scheme:

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</table>

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

Course Code: BTV 741 Credit Units: 01

Course Objective:
To facilitate the learner with Academic Language Proficiency and make them effective users of functional language to excel in their profession.

Course Contents:

Module I
Introduction to Public Speaking
Business Conversation
Effective Public Speaking
Art of Persuasion

Module II: Speaking for Employment
Types of Interview
Styles of Interview
Facing Interviews-Fundamentals and Practice Session
Conducting Interviews- Fundamentals and Practice Session
Question Answer on Various Dimensions

Module III
Resume Writing
Covering Letters
Interview Follow Up Letters

Module IV: Basic Telephony Skills
Guidelines for Making a Call
Guidelines for Answering a Call

Module V: Work Place Speaking
Negotiations
Participation in Meetings
Keynote Speeches

Examination Scheme:

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</table>

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

Text & References:
Jermy Comfort, Speaking Effectively, et.al, Cambridge
Krishnaswamy, N, Creative English for Communication, Macmillan
Raman Prakash, Business Communication, Oxford.
Taylor, Conversation in Practice.
Course Objective:
This course aims at enabling students towards:
Understand the importance of individual differences
Better understanding of self in relation to society and nation
Facilitation for a meaningful existence and adjustment in society
Inculcating patriotism and national pride

Course Contents:

Module I: Individual differences & Personality
Personality: Definition & Relevance
Importance of nature & nurture in Personality Development
Importance and Recognition of Individual differences in Personality
Accepting and Managing Individual differences (adjustment mechanisms)
Intuition, Judgment, Perception & Sensation (MBTI)
BIG5 Factors

Module II: Managing Diversity
Defining Diversity
Affirmation Action and Managing Diversity
Increasing Diversity in Work Force
Barriers and Challenges in Managing Diversity

Module III: Socialization
Nature of Socialization
Social Interaction
Interaction of Socialization Process
Contributions to Society and Nation

Module IV: Patriotism and National Pride
Sense of pride and patriotism
Importance of discipline and hard work
Integrity and accountability

Module V: Human Rights, Values and Ethics
Meaning and Importance of human rights
Human rights awareness
Values and Ethics - 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:

<table>
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</table>

Text & References:
- Davis, K. Organizational Behaviour,
- Bates, A. P. and Julian, J.: Sociology - Understanding Social Behaviour
- Dressler, David and Cans, Donald: The Study of Human Interaction
- Lapiere, Richard, T – Social Change
- Robbins O.B. Stephen,: Organizational Behaviour
Course Code:  BTV 744  Credit Units: 02

Course Objective:
Revise the portion covered in the first volume, give proper orientation in communication and culture.

Course Contents:
Module A: Unités 1 – 3: pp. 06 - 46

Contenu lexical:
Unité 1: Rédiger et présenter son curriculum vitae
- Expresser une opinion
- Caractériser, mettre en valeur
- Parler des rencontres, des lieux, des gens

Unité 2: Imaginer - Faire des projets
- Proposer - conseiller
- Parler des qualités et des défauts
- Faire une demande écrite
- Raconter une anecdote
- Améliorer son image

Unité 3: Exprimer la volonté et l’obligation
- Formuler des souhaits
- Expresser un manque/un besoin
- Parler de l’environnement, des animaux, des catastrophes naturelles

Contenu grammatical:
1. Le passé: passé composé/imparfait
2. Pronoms compléments directs/indirects, y/en (idées/choses)
3. Propositions relatives introduites par qui, que, où
4. Comparatif et superlatif
5. Le conditionnel présent
6. Situer dans le temps
7. Féminin des adjectifs
8. La prise de paroles: expressions
9. Le subjonctif: volonté, obligation

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
- le livre à suivre: Campus: Tome 2
GERMAN - VII

Course Code: BTV 745
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 Advanced Grammar and Business Language and Professional Jargon

Course Contents:

Module I: Dass- Sätze
Explain the use of the conjunction “-that”, where verb comes at the end of the sentence

Module II: Indirekte Fragesätze
To explain the usage of the “Question Pronoun” as the Relative Pronoun in a Relative Sentence, where again the verb falls in the last place in that sentence.

Module III: Wenn- Sätze
Equivalent to the conditional “If-” sentence in English. Explain that the verb comes at the end of the sentence.

Module IV: Weil- Sätze
Explain the use of the conjunction “because-” and also tell that the verb falls in the last place in the sentence.

Module V: Comprehension texts
Reading and comprehending various texts to consolidate the usage of the constructions learnt so far in this semester.

Module VI: Picture Description
Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

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 - VII

Course Code: BTV 746 Credit Units: 02

Course Objective:
To enable students acquire working knowledge of the language; to give them vocabulary, grammar, expressions used on telephonic conversation and other situations to handle everyday Spanish situations with ease.

Course Contents:

Module I
Revision of earlier semester modules

Module II
Zodiac signs. More adjectives…to describe situations, state of minds, surroundings, people and places.

Module III
Various expressions used on telephonic conversation (formal and informal)

Module IV
Being able to read newspaper headlines and extracts (Material to be provided by teacher)

Module V
Negative commands (AR ending verbs)

Module VI
Revision of earlier sessions and introduction to negative ER ending commands, introduction to negative IR ending verbs

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español En Directo I A, IB
- Español Sin Fronteras
- Material provided by the teacher from various sources
Course Objective:
To enable the students to converse in the language with the help of different speech, possibilities, probabilities etc.

Note: The teaching is done in roman as well as Japanese script. 10 more kanjis (Japanese characters) are taught in this semester.

Course Contents:

Module I: Thought
Expressing one’s thought and intentions on different situations.

Module II: Advice
Giving advice, probability, possibility and suggestions.

Module III: Informal Speech
Addressing friends and close people using informal ways.

Module IV: Simultaneous Verbs
Describing two situations simultaneously.

Module V: Possibility
Explaining the probability and possibility of any situation.

Learning Outcome
Students can interact in a formal as well as informal way on above-mentioned topics.

Methods of Private study/Self help
Hand-outs, audio-aids, assignments and role-plays will support classroom teaching.

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
- Shin Nihon-go no Kiso Lesson No.-31 to 35.
- All vocabulary and topics taught to the students are from the above mentioned book.
Course Code: BTV 748  Credit Units: 02

Course Objective:
The story of Cinderella first appears in a Chinese book written between 850 and 860 A.D. 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.
About china part –I Lesson 1, 2.

Module II
Pronunciation and intonation
Character Writing and stroke order.

Module III
Ask someone what he/she usually does on weekends?
Visiting people, Party, Meeting, After work….etc.

Module IV
Conversation practice
Translation from English to Chinese and vise-versa.
Short fables.

Module V
A brief summary of grammar.
The optative verb “yuanyi”.
The pronoun “ziji”.

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
- “Kan tu shuo hua” Part-I Lesson 1-7
PROJECT

Course Code: BTV 760  Credit Units: 02

Methodology
The topic for the project work can be a design/experimental/field surveying/analytical/simulation project in any topic of Civil Engineering arena. The work can be done individually or by a group of students under the guidance of a faculty of the Department. On completion of the project, the students are to present a report covering various aspects learnt by them and give a presentation on same.

Examination Scheme:

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<tr>
<td>Written Report</td>
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INDUSTRIAL TRAINING

Course Code: BTV 750       Credit Units: 06

Methodology:
Practical training is based on the theoretical subjects studied by students. An industry visit will be planned for each student and on-site practical training will be imparted with the help of the industry guide. The students are to learn various industrial, technical and administrative processes followed in the industry. On completion of the practical training the students are to present a report covering various aspects learnt by them and give a presentation on same.

Examination Scheme:

<table>
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<td>Training Report</td>
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<td>Viva</td>
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<td><strong>Total</strong></td>
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</table>
Course Code: BTV 704
Credit Units: 04

Course Objective:
This course deals with advanced concept of structural concrete design.

Course Contents:

Module I: Materials for prestressed concrete and prestressing systems
High strength concrete and high tensile steel – tensioning devices – pretensioning systems – post tensioning systems.

Module II: Analysis of prestress and bending stresses
Analysis of prestress – resultant stresses at a sector – pressure line or thrust line and internal resisting couple – concept of load balancing – losses of prestress – deflection of beams.

Module III: Strength of prestressed concrete sections in flexure, shear and torsion
Types of flexural failure – strain compatibility method – IS code procedure – design for limit state of shear and torsion.

Module IV: Design of prestressed concrete beams and slabs
Transfer of prestress in pre tensioned and post tensioned members – design of anchorage zone reinforcement – design of simple beams – cable profiles – design of slabs.

A design project for the design and detailing of a large span beam is envisaged at this stage.

Examination Scheme:

<table>
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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:

N. Krishna Raju, Prestressed concrete, Tata McGraw Hill, 2000
P. Dayaratnam, Prestressed Concrete, Oxford & IBH, 1982
BIS codes (IS 1343)
Course Objective:
This course deals with remote sensing and geographic information systems.

Course Contents:

Module I
Concepts and foundations of remote sensing - electromagnetic spectrum, energy sources and radiation principles, energy interactions in the atmosphere and with earth surface features, data acquisition and interpretation, reference data, ideal remote sensing systems, characteristics of real remote sensing systems. Classification of maps, map scale, spatial reference system, map projections, grid systems, linkage of GIS to remote sensing. Radar principle - Factors affecting microwave measurements, radar wavebands, SLAR systems, interaction between microwaves and earth's surface. Elements of photographic systems - film exposure, film density and characteristic curves, spectral sensitivity of black and white films, colour film and colour infrared film, filters, aerial cameras, film resolution, electronic and multi band imaging, aerial videography. Basic principles of photogrammetry – geometrical characteristics of aerial photographs, photographic scale, ground coverage, area measurement, relief displacement of vertical features, image parallax, ground control, mapping.

Module II
Remote sensing platforms and sensors - Satellite system parameters, sensor parameters, imaging sensor systems, earth resources and meteorological satellites with microwave sensors, scanners, radiometers. The Indian Remote Sensing Program. Data types and format, scale and legend. Visual Image Interpretation - types of pictorial data products, fundamentals of visual image interpretation, equipment, image interpretation strategy, process of image interpretation, key elements of visual image interpretation, false colour composites, application in natural resources management. Digital Image Processing - Basic character of a digital image, image rectification & restoration, preprocessing, registration, enhancement, contrast, spatial feature and multi image manipulation, spatial filtering, image transformations, image classification, performance analysis, data merging and GIS integration.

Module III
GIS overview – what is GIS, components, definitions & terminology, uses, GIS queries & architecture, theoretical models & framework, GIS technology trends, data sources, collection, and entry, data formats & standards, types of analysis, spatial data modeling, GIS data management, database models, storage of data, object based GIS models, data input & editing, data quality issues. Data analysis & modeling – Integration of remote sensing & GIS.

Module IV
Application of Remote Sensing & GIS in natural resources management with specific reference to impact of mining activities on environment, biodiversity, coastal zone protection, flood management, forest protection, monitoring urban growth, managing watersheds & water resources, hydrologic modeling, preventing natural disasters etc.

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:
Course Objective:
This course deals with advanced concept of structural concrete design.

Course Contents:

Module I: Approximate methods of analysis of multistorey frames
Analysis for vertical load - substitute frames - loading condition for maximum positive and negative bending moment in beams and maximum bending moment in column - analysis for lateral load - portal method - cantilever method and factor method
Matrix analysis of structures
Static and kinematic indeterminacy - force and displacement methods of analysis - definition of flexibility and stiffness influence coefficients - development of flexibility matrices by physical approach

Module II
Flexibility method: flexibility matrices for truss and frame elements - load transformation matrix - development of total flexibility matrix of the structure - analysis of simple structures - plane truss and plane frame - nodal loads and element loads - lack of fit and temperature effects
Stiffness method: development of stiffness matrices by physical approach - stiffness matrices for truss and frame elements - displacement transformation matrix - development of total stiffness matrix - analysis of simple structures - plane truss and plane frame - nodal loads and element loads - lack of fit and temperature effects

Module III: Direct stiffness method
Introduction - element stiffness matrix - rotation transformation matrix - transformation of displacement and load vectors and stiffness matrix - equivalent nodal forces and load vectors - assembly of stiffness matrix and load vector - determination of nodal displacements and element forces - analysis of plane truss - plane frame (with numerical examples) - analysis of grid - space-truss and space-frame (without numerical examples)

Module IV
Computer Implementation
A project on development of an analysis program using some of the above method is envisaged at this stage
Introduction to Analysis Packages
The numerical examples solved using the analysis program developed in the above to be verified using common commercial packages.

Examination Scheme:

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Text & References:

HYDROLOGY AND FLOOD CONTROL

Course Code: BTV 707  Credit Units: 04

Course Objective:
This course deals with advanced concept of hydrology.

Course Contents:

Module I
Introduction hydrologic cycle, water budget equations, world water balance, application in engineering. Precipitation: Forms of precipitation, measurement, depth-area-duration & intensity-duration-frequency relationships, probable maximum precipitation.

Module II
Abstraction from Precipitation: Evaporation – process, measurement and estimation; Evapotranspiration-measurement and estimation; Initial Losses-Interception & Depression storage; Infiltration-process, capacities, indices, measurement & estimation

Module III: Runoff and Hydrographs
Hydrograph, runoff characteristics of stream, Yield, Rainfall-runoff correlations, flow duration curve, mass curve, droughts and floods. Factors affecting flood hydrographs, unit hydrograph and its analysis, s-curve hydrograph, synthetic and instantaneous unit hydrographs.

Module IV: Flood
Rational method, empirical formulae, unit hydrograph method, flood frequency studies, statistical analysis, regional flood frequency analysis, design storm & design flood, risk/reliability and safety factor; Flood Routing: Basic equation, hydrologic storage routing & attenuation, hydrologic channel routing, flood forecasting & control, hydraulic method of flood routing.

Examination Scheme:

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Text & References:

‘Hydrology for Engineers’ by Linsley R. K., Kohler M. A. and Paulhus J. L. H.
‘Engineering Hydrology’ by K. Subramanya
‘Hydrology: Principles, Analysis, Design’ by Raghunath H. M.
‘Handbook of Applied Hydrology’ by Chow V. T.
‘Irrigation: Theory & Practice’ by Michael A. M.
ENVIRONMENTAL POLLUTION CONTROL ENGINEERING

Course Code: BTV 708  Credit Units: 04

Course Objective:
This course deals with advanced concept of environmental pollution and its control.

Course Contents:

Module I
Environmental pollution - interrelationship between various forms of pollution - surface water pollution surveys - integrated river basin water management - restoration of water bodies - water quality changes by domestic use - radioactive materials - thermal pollution and underground disposal - types of water pollutants and their effects - instrumentation for water quality and treatment

Module II
Air pollution control strategy – air pollution control technology – methodological factors affecting air pollution – air pollution surveys – instrumentation for air quality measurement – air quality standards

Module III
Land pollution – land pollution surveys - ecological aspects of vegetation control
Noise pollution - effects of noise - sources – noise control techniques - instruments for noise measurement
Light and glare pollution – outside lighting and glare sources - corrective procedures

Module IV
Water pollution laws and regulations
Air pollution control Act of India
Land pollution laws and regulations
The Environment (Protection) act, 1986

Examination Scheme:

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Text & References:
Goel P.K., Water Pollution Causes, Effects & Control, New Age International (P) Ltd.
Liptak Bela G., Environmental Engineers Hand Book Vols I, II & III
COMPUTER AIDED ANALYSIS AND DESIGN IN CIVIL ENGINEERING

Course Code: BTV 709  Credit Units: 04

Course Objective:
The main objective of this programme is to train the student in the use of computers and creating a computer code as well as using commercially available software for the design of Civil Engineering structures.

Course Contents:

Module I: Introduction
Fundamentals of CAD - Hardware and software requirements -Design process – Applications and benefits.

Module II: Computer Graphics
Graphic primitives - Transformations - Wire frame modeling and solid modeling – Graphic standards – Drafting packages

Module III: Structural Analysis
Fundamentals of finite element analysis - Principles of structural analysis - Analysis packages and applications.

Module IV: Design & Optimisation
Principles of design of steel and RC Structures - Applications to simple design problems – Optimisation techniques - Algorithms - Linear Programming – Simplex method

Module V: Expert Systems
Introduction to artificial intelligence - Knowledge based expert systems - Rules and decision tables – Inference mechanisms - Simple applications.

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Text & References:

CONSTRUCTION MANAGEMENT AND QUANTITY SURVEYING

Course Code: BTV 801 Credit Units: 03

Course Objective:
The main objective of this course is to train the student construction management and quantity surveying

Course Contents:

Module I
Construction planning: Preparation of job layout – labour schedule – material schedule – equipment schedule

Module II:

Module III
Quantity surveying - preparation of detailed estimates for: buildings - reinforced concrete structures - sanitary and water supply works

Module IV
Preparation of specification for common materials of construction and items of work as per IS - analysis of rates and preparation of abstract of estimate
Introduction to valuation of real properties: Depreciation – Sinking fund – methods of valuation

Examination Scheme:

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Text & References:

- Verma L.C., Standardisation - A New Discipline
- Peurifoy R.L., & Ledbetter W.B., Construction Planning Equipment & Methods,
- Chakrabarthi, Estimation, Costing, Specification in Civil Engg,
- Shah N.A., Quantity Surveying & Specification in Civil Engg,
- IS 1200 (1968), Methods of Measurement of Building & Civil Engg. Works
ENGINEERING ECONOMICS AND MANAGEMENT

Course Code: BTV 802  Credit Units: 03

Course Objective:
The main objective of this course is to train the student construction management and quantity surveying

Course Contents:

Module I: Organisations and their Economic Environment

Module II: Macroeconomics

Module III: Introduction to Management

Module IV: Financial and Inventory Management

Examination Scheme:

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Text & References:

- G.W. Plossl, Production and inventory control by, Prentice Hall.
- Aninnya Sen, Microeconomics – Theory and Applications, OUP.
PROJECT

Course Code: BTV 860

Credit Units: 15

Methodology
Topics of project are to be based on the latest trends, verifying engineering concepts /principals and should involve elementary research work. The projects may involve design, fabrications, testing, computer modeling, and analysis of any engineering problem. On completion of the project, the students are to present a report covering various aspects learnt by them and give a presentation on same.

Examination Scheme:

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<td>Presentation</td>
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COMMUNICATION SKILLS - VI

Course Code: BTV 841
Credit Units: 01

Course Objective:
The modules are designed to enhance the communicative competence of the learners to equip them with efficient interpersonal communication.

Course Contents:

Module I: Dynamics of Group Discussion
Introduction,
Methodology
Role Functions
Mannerism
Guidelines

Module II: Communication through Electronic Channels
Introduction
Technology based Communication Tools
Video Conferencing
Web Conferencing
Selection of the Effective Tool
E-mails, Fax etc.

Module III: Effective Public Speaking
Types
Essentials
Success in Public Speaking
Dos and Don’ts

Examination Scheme:

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<th>Components</th>
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</table>

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

Text & References:

- Jermy Comfort, Speaking Effectively, et.al, Cambridge
- Krishnaswamy, N, Creative English for Communication, Macmillan
- Taylor, Conversation in Practice,
BEHAVIOURAL SCIENCE - VIII
(PERSONAL AND PROFESSIONAL EXCELLENCE)

Course Code: BTV 843  Credit Units: 01

Course Objective:
Importance of Personal and Professional excellence
Inculcating the components of excellence

Course Contents:

Module I: Components of Excellence
Personal Excellence:
Identifying long-term choices and goals
Uncovering the talent, strength & style
Analyzing choke points in your personal processes by analysis in area of placements, events, seminars, conference, extracurricular activities, projects etc.

Module II: Managing Personal Effectiveness
Setting goals to maintain focus
Dimensions of personal effectiveness (self disclosure, openness to feedback and perceptiveness)
Integration of personal and organizational vision for effectiveness
A healthy balance of work and play
Managing Stress creatively and productively

Module III: Personal Success Strategy
Time management
Handling criticism and interruptions
Dealing with difficult people
Mapping and evaluating the situations
Identifying long-term goals

Module IV: Positive Personal Growth
Understanding & Developing positive emotions
Positive approach towards future
Resilience during loss and challenge

Module V: Professional Success
Building independence & interdependence
Reducing resistance to change
Continued reflection (Placements, events, seminars, conferences, projects extracurricular Activities 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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Course Objective:
Provide students with the necessary linguistic tools
- to face up to different situations of communication
- to enhance their capacity in oral/written comprehension/expression

Course Contents:
Module B: Unités 4, 5, 6: PP. 48 - 86

Contenu lexical: Unité 4:
1. Présenter une information/les circonstances d’un événement
2. Exprimer la possibilité/la probabilité
3. Exprimer une quantité indéfinie
4. Comprendre et raconter un fait div

Unité 5:
1. Parler d’une passion, d’une aventure
2. Choisir/créer
3. Exprimer la surprise/des sentiments

Unité 6:
1. Exprimer la cause et la conséquence
2. Exprimer la crainte et rassurer
3. Faire une démonstration

Contenu grammatical:
là construction passive
la forme impersonnelle
l’interrogation
les adjectifs et les pronoms indéfinis
les pronoms interrogatifs et démonstratifs
la construction avec deux pronoms
le subjonctif dans l’expression des sentiments, de la crainte, du but
constructions permettant l’expression de la cause et de la conséquence
l’enchaînement des idées: succession et opposition

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
- le livre à suivre: Campus: Tome 2
GERMAN - VIII

Course Code: BTV 845 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 Advanced Grammar and Business Language and Professional Jargon

Course Contents:

Module I: Reading and comprehension
Reading texts and comprehending them

Module II: Information about German History
Acquiring information about German History through appropriate texts and stories

Module III: Bio data/Curriculum vitae
Writing a bio-data in the proper format with all essential components

Module IV: Informal letters
Reading and writing informal letters

Module V: Business etiquette
Business etiquette in Germany and types of companies

Module VI: Interview skills
To learn to face interviews
Read a text ‘Interviewspiel’

Module VII: Picture Description
Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

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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
Course Code: BTV 846  Credit Units: 02

Course Objective:
To enable students to deal with Spanish situations putting things in perspective, using Past Tense. Enabling them to comprehend and form slightly complex sentences. Give students vocabulary of various situations.

Course Contents:

Module I
Situational exercises/Picture Description:
At the cine
At the Chemist’s/Hospital

Module II
At a corporate client’s informal/formal meeting/gathering
Looking for accommodation

Module III
Past Tense (Indefinido) of regular verbs
Past Tense (Indefinido) of irregular verbs
Exercises related to the above

Module IV
Past Tense (Imperfecto)

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español En Directo I A, 1B
- Español Sin Fronteras
- Material provided by the teacher from various sources
JAPANESE - VIII

Course Code: BTV 847
Credit Units: 02

Course Objective:
To enable the students to converse in the language with the help of different forms as volitional forms, active and passive voice and decision making etc.

Note: The course and teaching in Roman as well as Japanese script. Also introducing next 10 to 20 kanjis.

Course Contents:

Module I: Volitional forms
Explaining the situation when one is thinking of doing something.

Module II: Active and Passive voice
Direct and indirect ways of speech.

Module III: Plain Forms
Sentence patterns using plain forms of verb.

Module IV: Causes and effects
Explaining causes and effects with different forms of verb.

Module V: Decision making
Expressing different occupations and how to make decision.

Learning Outcome
➢ Students can speak the language and will be able to express their views and opinions comfortably.

Methods of Private study/ Self help
➢ Hand-outs, audio-aids, assignments and role-plays will support classroom teaching.

Examination Scheme:

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
Shin Nihon-go no Kiso Lesson No.-36 to 40.
All vocabulary and topics taught to the students are from the above mentioned book.
Course Code: BTV 848  
Credit Units: 02

Course Objective:
Paper was first invented in China in 105 AD. It was a closely guarded secret and didn’t reach Europe until the 8th Century. 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.
The aspect particle “le” and the modal particle “le”.

Module II
Optative verbs
Texts based on different topics
Enriching vocabulary by dealing with various daily scenarios and situations.

Module III
Sentences with subject predicate construction as its predicate
Pronunciation and intonation
Character writing and stroke order

Module IV
About china Part I Lesson 2,3
Chinese to English and English to Chinese translations from the news paper.

Module V
Questions with an interrogative pronoun
Essays, writing formal letters.
Conversation practice.

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C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- “Kan tu shuo hua” Part-I Lesson 8-13
Course Objective:
At the end of this course the student shall have a basic knowledge of finite element method and shall be able to analyse linear elastic structures, that he has studied about in core courses, using finite element method.

Course Contents:

Module I: Boundary value problems and the need for numerical discretisation
Introduction, examples of continuum problems, history of finite element method.
Weighted residual methods
Approximation by trial functions, weighted residual forms, piecewise trial functions, weak formulation, Galerkin method, examples of one-, two- and three-dimensional problems.

Module II: Higher order finite element approximation
Degree of polynomial in trial functions and rate of convergence, the patch test, shape functions for $C^0$ and $C^1$ continuity, one-, two- and three-dimensional shape functions.
Isoparametric formulation
The concept of mapping, isoparametric formulation, numerical integration, mapping and its use in mesh generation.

Module III: Variational methods
Variational principles, establishment of natural variational principles, approximate solution of differential equations by Rayleigh-Ritz method, the use of Lagrange multipliers, general variational principles, penalty functions, least-square method.
Partial discretisation and time-dependent problems
Partial discretisation applied to boundary value problems, time-dependent problems via partial discretisation, analytical solution procedures, finite element solution procedures in time domain.

Module IV: Generalised finite elements and error estimates
The generalised finite element method, the discretisation error in a numerical solution, measure of discretisation error, estimate of discretisation error.
Coordinate Transformation: Transformation of vectors and tensors, transformation of stiffness matrices, degree of freedom within elements, condensation, condensation and recovery algorithm, substructuring, structural symmetry.

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Text & References:

Course Objective:
The students acquire comprehensive knowledge of traffic surveys and studies such as ‘Volume Count’, ‘Speed and delay’, ‘Origin and destination’, ‘Parking’, ‘Pedestrian’ and ‘Accident surveys’. They achieve knowledge on design of ‘at grade’ and ‘grade separated’ intersections. They also become familiar with various traffic control and traffic management measures.

Course Contents:

Module I: Introduction
Significance and scope, Characteristics of Vehicles and Road Users, Skid Resistance and Braking Efficiency (Problems), Components of Traffic Engineering - Road, Traffic and Land Use Characteristics

Module II: Traffic Surveys and Analysis
Surveys and Analysis - Volume, Capacity, Speed and Delays, Origin and Destination, Parking, Pedestrian Studies, Accident Studies and Safety Level of Services - Basic principles of Traffic Flow.

Module III: Traffic Control
Traffic signs, Road markings, Design of Traffic signals and Signal co-ordination (Problems), Traffic control aids and Street furniture, Street Lighting, Computer applications in Signal design

Module IV: Geometric Design of Intersections
Conflicts at Intersections, Classification of ‘At Grade Intersections, - Channallised Intersections - Principles of Intersection Design, Elements of Intersection Design, Rotary design, Grade Separation and interchanges - Design principles.

Module V: Traffic Management
Traffic Management- Transportation System Management (TSM) - Travel Demand Management (TDM), Traffic Forecasting techniques, Restrictions on turning movements, Oneway Streets, Traffic Segregation, Traffic Calming, Tidal flow operations, Exclusive Bus Lanes, Introduction to Intelligent Transportation System (ITS).

Examination Scheme:

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Text & References:

- Indian Roads Congress (IRC) specifications: Guidelines and special publications on Traffic Planning and Management
- Guidelines of Ministry of Road Transport and Highways, Government of India.
COMPUTER APPLICATION IN HYDRO ENGINEERING

Course Code: BTV 805  Credit Units: 04

Course Objective:
This course deals with computer application in hydroengineering.

Course Contents:

Module I
Review of Basic Hydraulic Principles – General flow characteristics, Energy and momentum principles and Equations, Pressure and free surface flows, HGL and TEL, Major and minor losses, Computer applications to simple flow problems, Introduction to SAP.

Module II
Drainage Inlet Design, Culvert Hydraulics and Design.
Pressure Piping Systems & Water Quality Analysis – Analysis and design of water distribution systems
Introduction to Some Packages such as Flow Master, Storm CAD, Culvert Master, Water CAD, and Sewer CAD and EPANET.

Module III
Flow Routing - Hydrologic and hydraulic methods of routing, Sanitary sewer design including extended period simulation and routing.
Watershed modeling – Basic principles – Introduction to SWMM

Module IV
Water quality modeling in streams - Basic models, Introduction to software packages.
Ground water quality modeling
Introduction to remote sensing and GIS applications and web based applications

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Text & References:

WATER RESOURCES SYSTEM PLANNING AND DESIGN

Course Code: BTV 806  Credit Units: 04

Course Objective:
This course deals with design and planning of water resources system.

Course Contents:

Module I
Issues and the systems planning approach - water system dynamics - water resource development alternatives – Water systems planning objectives - Constraints and Criteria – Economic and Econometric principles

Module II
Hydrologic input analysis, Demand analysis, System elements & Subsystem planning - Stochastic planning and management - Design and management issues.

Module III
Optimization methods and their application in W.R. systems. Linear programming and Dynamic programming models. Problem formulation for W.R systems – Multi objective planning – Large scale system analysis - Case studies.

Module IV
Ground water system planning – Conjunctive surface and GW development- Hierarchical approach- Water quality management planning- Regional planning- Policy issues.

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Text & References:

ADVANCED CONCRETE DESIGN

Course Code: BTV 807  Credit Units: 04

Course Objective:
This course deals with advanced design of concrete structures.

Course Contents:

Module I
Large span concrete roofs
Shells and Folded plates
A design project involving the complete design of one of the above is envisaged at this stage

Module II
Deep beams
Analysis of deep beams - design as per BIS - design using strut and tie method.
Chimneys
Analysis of stresses in concrete chimneys - uncracked and cracked sections - codal provisions - design of chimney.
A project involving the design of a deep beam and concrete chimney is envisaged at this stage.

Module III: Water tanks
Introduction - rectangular and circular with flat bottom - spherical and conical tank roofs - staging - design as per BIS.
A project involving the design and detailing of a water tank is envisaged at this stage.

Module IV: Bridges
Design of slab culvert – R.C box culverts –T-beam bridges – Concept on design of continuous bridges, balanced cantilever bridges, arch bridges and rigid frame bridges.
A project involving the design and detailing of a slab culvert/ T-beam bridge is envisaged at this stage.

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Text & References:

- G.S. Ramaswamy, Design and Construction of Concrete Shell Roofs - CBS publishers, 1986
- Taylor C Pere, Reinforced Concrete Chimneys, Concrete publications, 1960
- Design of deep girders, Concrete Association of India, 1960
- Mallick & Gupta, Reinforced Concrete, - Oxford & IBH, 1982
- BIS codes (IS 456, IS 2210, IS 4998, IS 3370, SP 16, SP 24, SP 34).
- IRC Codes (IRC 5, IRC 6, IRC 21)
ADVANCED STEEL DESIGN

Course Code: BTV 808  
Credit Units: 04

Course Objective:  
This course deals with advanced design of steel structures.

Course Contents:

Module I: Plate girder bridges  
Plate girders – loads – equivalent uniformly distributed loads – Indian railway code of practice – design of plate girder bridges – bearings.  
A design project involving the design of a plate girder is envisaged at this stage

Module II  
Bunkers, Silos  
Introduction– Janssen’s theory– Airy’s theory– design criteria.  
Transmission Towers  
Introduction–loads on towers– analysis–design of members and foundation.  
A design project involving the design of any of the above structures is envisaged at this stage

Module III  
Gantry Girder  
Design of gantry girder – gantry to column connection.  
Water Tanks  
Design of rectangular, pressed steel tanks – design of suspended bottom tanks – cylindrical tank with hemispherical bottom – design of staging.  
A design project involving the design and detailing of a gantry girder and water tank is envisaged at this stage

Module IV  
Light gauge members – Light gauge sections – design considerations – allowable stresses – buckling, design of compression members, tension members and laterally supported beams – connections.  
A design project involving the design of a light gauge structure is envisaged at this stage

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Text & References:

- P. Dayaratnam, Design of Steel Structures, (Wheeler),1998
- M. Raghupathi, Design of Steel Structures, Tata McGraw Hill, 1985
- Lin & Breslar, Design of Steel Structures, John Wiley & Sons, 1963
- BIS codes (IS 800, SP 6, IS 804, IS 805, IS 6533, IS 9178, IS 801, IS 811)
ARCHITECTURE AND TOWN PLANNING

Course Code: BTV 809
Credit Units: 04

Course Objective:
To provide the basic knowledge on the principles of design of buildings relating to the environment and climate.

Course Contents:

Module I: Architectural Design
Architectural Design – an analysis – integration of function and aesthetics – Introduction to basic elements and principles of design.

Module II: Site Planning
Surveys – Site analysis – Development Control – Layout regulations - Layout design concepts.

Module III: Building Types
Residential, institutional, commercial and Industrial – Application of anthropometry and space standards-Inter relationships of functions – Safety standards – Building rules and regulations – Integration of building services – Interior design

Module IV: Climate and Environmental Responsive Design
Man and environment interaction- Factors that determine climate – Characteristics of climate types – Design for various climate types – Passive and active energy controls – Green building concept

Module V: Town Planning
Planning – Definition, concepts and processes- Urban planning standards and zoning regulations- Urban renewal – Conservation – Principles of Landscape design

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Text & References:

INDUSTRIAL WASTE ENGINEERING

Course Code: BTV 810  Credit Units: 04

Course Objective:
To provide the basic knowledge on the principles of design of buildings relating to the environment and climate.

Course Contents:

Module I
Nature and characteristics of Industrial wastes- prevention versus control of industrial pollution- Linkage between technology and pollution prevention- tools for clean processes- reuse, recycle, recovery, source reduction, raw material substitution, toxic use reduction and process modification- separation technologies as tools for waste minimization- Flow sheet analysis- Energy and resource audits-waste audits

Module II
Treatment of industrial waste- suitability of different techniques- disposal of industrial waste

Module III
Effluent generation from textile industry – paper industry – dairy – fertilizer – thermal power plants - effluent characteristics- treatment

Module IV
Environmental impact of textile industry – paper industry - dairy - fertilizer – thermal power plant
Study of damages caused by industrial pollution in India and Kerala (typical problems).

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