

Bachelor of Technology (Bioinformatics)

Programme Code: BTF

Duration – 4 Years Full Time

Programme Structure

And

Curriculum & Scheme of Examination

2010

**AMITY UNIVERSITY UTTAR PRADESH
GAUTAM BUDDHA NAGAR**

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:

<u>Components</u>	<u>Codes</u>	<u>Weightage (%)</u>
Case Discussion/ Presentation/ Analysis	C	05 - 10
Home Assignment	H	05 - 10
Project	P	05 - 10
Seminar	S	05 - 10
Viva	V	05 - 10
Quiz	Q	05 - 10
Class Test	CT	10 - 15
Attendance	A	05
End Semester Examination	EE	70

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, 2010

PROGRAMME OBJECTIVE

In the era of ever increasing amount of biological data, it is equally important to manage the data as well as to interpret it correctly. Thus, a course in Bioinformatics will enable the students to compile all the available information in a systematic manner and also to determine the meaning and structure of the biological information available in the existing databases. It will help the students to understand the algorithms of mathematical tools on which the analysis of biological data is based. In a nutshell, it integrates the developments in information and computer technology as applied to Biotechnology and Biological Sciences.

PROGRAMME STRUCTURE

FIRST SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits	Page No.
BTF 101	Applied Mathematics - I	3	1	-	4	
BTF 102	Applied Physics - I	2	1	-	3	
BTF 103	Applied Chemistry - I	2	1	-	3	
BTF 104	Introduction to Computers	2	-	-	2	
BTF 105	Life Sciences	2	-	-	2	
BTF 106	Environment Studies	4	-	-	4	
BTF 120	Applied Physics Lab - I	-	-	2	1	
BTF 121	Applied Chemistry Lab - I	-	-	2	1	
BTF 122	Programming in C Lab	-	-	2	1	
BTF 123	Engineering Graphics Lab	-	-	2	1	
	English	1	-	-	-	
BTF 143	Behavioural Science - I	1	-	-	1	
	Foreign Language - I	2	-	-	2	
BTF 144	French					
BTF 145	German					
BTF 146	Spanish					
BTF 147	Japanese					
BTF 148	Chinese					
	TOTAL				25	

Note: The students will study English from Ist semester but final evaluation will be done at the end of IInd semester. However continuous evaluation will start from the Ist Semester.

SECOND SEMESTER

BTF 201	Applied Mathematics - II	3	1	-	4	
BTF 202	Applied Physics - II	2	1	-	3	
BTF 203	Applied Chemistry - II	2	1	-	3	
BTF 204	Object Oriented Programming in C++	2	1	-	3	
BTF 205	Electrical Science	2	-	-	2	
BTF 220	Applied Physics Lab - II	-	-	2	1	
BTF 221	Applied Chemistry Lab - II	-	-	2	1	
BTF 222	Object Oriented Programming in C++ Lab	-	-	2	1	
BTF 223	Electrical Science Lab	-	-	2	1	
BTF 240	English	1	-	-	3	
BTF 243	Behavioural Science - II	1	-	-	1	
	Foreign Language - II	2			2	
BTF 244	French					
BTF 245	German					
BTF 246	Spanish					
BTF 247	Japanese					
BTF 248	Chinese					
	TOTAL				25	

TERM PAPER (DURING SUMMER BREAK)

THIRD SEMESTER

BTF 301	Cell Biology	3	-	-	3	
BTF 302	Biochemistry - I	3	-	-	3	
BTF 303	Microbiology	3	-	-	3	
BTF 304	Basics of Computer Systems & Programming	4	-	-	4	

BTF 305	Internet Technologies	2	-	-	2	
BTF 320	Cell Biology Lab	-	-	2	1	
BTF 321	Biochemistry - I & Microbiology Lab	-	-	4	2	
BTF 322	Computers Lab - I	-	1	2	2	
BTF 323	Internet Technologies Lab	-	-	2	1	
BTF 330	Term Paper (Evaluation)	-	-	-	3	
BTF 341	Communication Skills - I	1	-	-	1	
BTF 343	Behavioural Science - III	1	-	-	1	
BTF 344	Foreign Language - III	2	-	-	2	
BTF 345	French					
BTF 346	German					
BTF 347	Spanish					
BTF 348	Japanese					
BTF 348	Chinese					
	TOTAL				28	

FOURTH SEMESTER

BTF 401	Biochemistry - II	3	-	-	3	
BTF 402	Molecular Biology	3	-	-	3	
BTF 403	Computers - II	3	-	-	3	
BTF 404	Genetics	3	-	-	3	
BTF 405	Statistics	3	-	-	3	
BTF 406	Chemical Biology	2	-	-	2	
BTF 420	Biochemistry Lab - II	-	-	2	1	
BTF 421	Molecular Biology & Genetics Lab	-	1	2	2	
BTF 422	Computers Lab - II	-	-	4	2	
BTF 441	Communication Skills - II	1	-	-	1	
BTF 443	Behavioural Science - IV	1	-	-	1	
BTF 444	Foreign Language - IV	2	-	-	2	
BTF 445	French					
BTF 446	German					
BTF 447	Spanish					
BTF 448	Japanese					
BTF 448	Chinese					
	TOTAL				26	

SUMMER PROJECT - I (4 - 6 WEEKS)

FIFTH SEMESTER

BTF 501	Structural Biology	3	-	-	3	
BTF 502	Computational Biology – I	3	-	-	3	
BTF 503	Immunology	3	-	-	3	
BTF 504	Recombinant DNA Technology	3	-	-	3	
BTF 505	Computers - III	3	-	-	3	
BTF 520	Structural Biology Lab	-	-	2	1	
BTF 521	Computational Biology Lab – I	-	-	2	1	
BTF 522	Immunology Lab	-	-	2	1	
BTF 523	Recombinant DNA Technology Lab	-	-	2	1	
BTF 524	Computers Lab - III	-	-	2	1	
BTF 541	Communication Skills - III	1	-	-	1	
BTF 543	Behavioural Science - V	1	-	-	1	
BTF 544	Foreign Language - V	2	-	-	2	
BTF 545	French					
BTF 546	German					
BTF 547	Spanish					
BTF 548	Japanese					
BTF 548	Chinese					
BTF 560	Summer Project - I (Evaluation)	-	-	-	6	

	TOTAL				30	
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SIXTH SEMESTER

BTF 601	Genomics	3	-	-	3	
BTF 602	Computational Proteomics	3	-	-	3	
BTF 603	Computational Biology - II	3	-	-	3	
BTF 604	Bioinformatics Algorithms	3	-	-	3	
BTF 605	Computers - IV	3	-	-	3	
BTF 620	Genomics Lab	-	-	2	1	
BTF 621	Computational Proteomics Lab	-	-	2	1	
BTF 622	Computational Biology Lab - II	-	-	2	1	
BTF 623	Bioinformatics Algorithms Lab	-	-	2	1	
BTF 624	Computers Lab - IV	-	1	2	2	
BTF 641	Communication Skills – IV	1	-	-	1	
BTF 643	Behavioural Science - VI	1	-	-	1	
BTF 644	Foreign Language - VI	2	-	-	2	
BTF 645	French					
BTF 646	German					
BTF 647	Spanish					
BTF 648	Japanese					
BTF 648	Chinese					
	TOTAL				25	

SUMMER PROJECT - II (4 - 6 WEEKS)

SEVENTH SEMESTER

BTF 701	Clinical Data Management	3	-	-	3	
BTF 702	Data Mining	3	-	-	3	
BTF 703	SAS (Statistical Analysis System) & R	2	-	-	2	
BTF 704	ELECTIVE (Any one)	2	-	-	2	
BTF 705	• BioPerl					
BTF 706	• BioJava					
BTF 706	• VB.NET					
BTF 707	R & Bioconductor	2	-	-	2	
BTF 720	Clinical Data Management Lab	-	-	2	1	
BTF 721	Data Mining Lab	-	-	2	1	
BTF 722	SAS (Statistical Analysis System) & R Lab	-	-	2	1	
BTF 723	ELECTIVE Lab (Any one)	-	-	4	2	
BTF 724	• BioPerl					
BTF 725	• BioJava					
BTF 725	• VB.NET					
BTF 726	R & Bioconductor Lab	-	-	4	2	
BTF 741	Communication Skills - V	1	-	-	1	
BTF 743	Behavioural Science - VII	1	-	-	1	
BTF 744	Foreign Language - VII	2	-	-	2	
BTF 745	French					
BTF 746	German					
BTF 747	Spanish					
BTF 748	Japanese					
BTF 748	Chinese					
BTF 760	Summer Project - II (Evaluation)	-	-	-	6	
	TOTAL				29	

EIGHTH SEMESTER

BTF 801	Principles of Management & Entrepreneurship Development	3	-	-	3	
BTF 802	Project Management	3	-	-	3	

BTF 803	Molecular Modeling & Drug Designing	3	-	-	3	
BTF 801	IPR and Regulatory issues	3	-	-	3	
BTF 841	Communication Skills -VI	1	-	-	1	
BTF 843	Behavioural Science - VIII	1	-	-	1	
BTF 844	Foreign Language - VIII	2	-	-	2	
BTF 845	French					
BTF 846	German					
BTF 847	Spanish					
BTF 848	Japanese					
BTF 848	Chinese					
BTF 822	Molecular Modeling & Drug Designing Lab	-	-	2	1	
BTF 860	Major Project (12 Weeks)	-	-	-	16	
	TOTAL				33	

Curriculum & Scheme of Examination

APPLIED MATHEMATICS – I

Course Code: BTF 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

Derivative of a function, Derivatives at a point, Fundamental rules for differentiation: Product Rule, Quotient Rule and Chain Rule, Differentiation of Implicit Functions, Parametric forms and Logarithmic Differentiation, Successive differentiation, Leibnitz's theorem (without proof), Mean value theorem, Taylor's and Maclaurin's Theorem, Asymptote & Curvature, Partial Differentiation, Euler's Theorem, Maxima and Minima

Module II: Integral Calculus

Fundamental Integral Formulae, Methods of Integration: Integration by Substitution, By Parts, Partial Fractions, Definite Integral and its Properties, Reduction Formulae, Application to length, Area and Volume.

Module III: Ordinary Differential Equations

Definition of Order and Degree of differential equation, Formation of ODEs, Solution of Differential Equation of 1st Order and 1st Degree: Variable Separation, Homogeneous Differential Equations, Linear Differential Equations, Exact Differential Equations, General Linear ODE of Second Order, Solution of Homogeneous Equation, Solution of Simple Simultaneous ODE

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

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: BTF 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 and engineering

Course Contents:

Module I: Electrostatics

Brief introduction of Vectors, gradient of a scalar field, divergence and curl of vector field, Electric flux, Gauss's law, Statements of Gauss divergence and Stokes theorem

Module II: Relativity

Michelson-Morley experiment, Inertial & non-inertial frames, Special theory of Relativity, Relativistic space-time transformation, Transformation of velocity, Variation of mass with velocity, Mass-energy equivalence

Module III: Oscillations & Waves

Simple harmonic motion – equation and energy conservation, superposition of two SHMs, Lissajous figures, damped and forced oscillations – equations, amplitude and frequency response, LCR Circuit, resonance, sharpness of resonance, equation of motion for plane progressive waves, superposition of waves

Module IV: Wave Nature of Light

Interference: Conditions of interference, division of wavefront, Fresnel's biprism, division of amplitude, interference due to thin films, Newton's rings

Diffraction: Fresnel and Fraunhofer diffraction, Fraunhofer diffraction at a single slit, Transmission grating and its resolving power.

Polarization: Birefringence, Nicol prism, Production and analysis of plane, circularly and elliptically polarized light, Half and quarter wave plates, Optical rotation

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

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

APPLIED CHEMISTRY- I

Course Code: BTF 103

Credit Units: 03

Course Objective:

Four basic sciences, Physics, Chemistry, Mathematics and Biology are the building blocks in engineering and technology. Chemistry is essential to develop analytical capabilities of students, so that they can characterize, transform and use materials in engineering and apply knowledge in their field. All engineering fields have unique bonds with chemistry whether it is Aerospace, Mechanical, Environmental and other fields the makeup of substances is always a key factor, which must be known. For electronics and computer science engineering, apart from the material, computer modeling and simulation knowledge can be inherited from the molecule designing. The upcoming field of technology like Nanotechnology and 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 starting from the very basic bonding mechanism to the application of materials.

Course Contents:

Module I: Chemical Bonding

Types of bond: Ionic, Covalent and Co-ordinate bond; Fajan's rule; Hybridisation; H- bonding ; Valence bond and Molecular orbital theory for diatomic molecule.

Module II: Organic Mechanism

Electronegativity and dipole moment; Electron Displacement Effects: Inductive Effect; Mesomeric Effect; Electromeric Effects; Fission of covalent bonds; Intermediates of Organic reactions; Carbonium, Carbanion, Free Radical and Carbene; Types of organic reactions; Substitution, Elimination, Addition.

Module III: Instrumental method for Analysis

Introduction; Principles of spectroscopy; Law's of Absorbance; IR: Principle Instrumentation; Application; UV: Principle, Instrumentation and Application; NMR Principle and Instrumentation; Application; Chromatography; GC: Principle, Instrumentation and Application; HPLC: Principle, Instrumentation and Application.

Module IV: Thermodynamics

Introduction; Terminology; First Law; Heat Capacity; Calculation of thermodynamic quantities; Adiabatic and Isothermal Process; Reversible and Irreversible Process; Second law of Thermodynamics; Standard State; Gilbb's Helmholtz equation; VantHoff Isotherm and Isochore; Maxwell Relation; Third law of Thermodynamics; Chemical Potential; Activity and Activity Coefficient; Coupled Reactions.

Module V: Chemical Equilibrium

Introduction ; Le Chatelier's Principle; Equilibrium constant from Thermodynamic Constants; Acid-Base Concept; Weak acid and Weak base and their salts; Solubility Product; pH and pOH, Buffer Solution, Buffer Action.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Engineering Chmistry, Jain & Jain
- Engineering Chmistry, Shashi Chawla

References:

- Organic Mechanism, Morrison and Boyd
- Physical Chemistry, Puri Sharma and Pathania
- Organic Chemistry Vol-I , IL Finar
- Organic Chemistry Vol-II, IL Finar
- Physical Chemistry, Atkins Peter, Paula Julio
- A guide to mechanism in organic chemistry, Peter Sykes.
- Introduction to practical chemistry, K.K.Sharma
- Concise Inorganic chemistry, J.D. Lee

INTRODUCTION TO COMPUTERS

Course Code: BTF 103

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 and 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 and 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 and their interconversions. Binary arithmetic, floating point arithmetic, signed and unsigned numbers, Memory storage unit.

Module II: Programming in C

History of C, Introduction of C, Basic structure of C program, Concept of variables, constants and data types in C, Operators and expressions: Introduction, arithmetic, relational, Logical, Assignment, Increment and decrement operator, Conditional, bitwise operators, Expressions, Precedence of Arithmetic operators, Operator precedence of Arithmetic Operators, Operator precedence and associativity. Managing Input and output Operation, formatting I/O.

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 and 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 and pointers Argument passing using pointers, Array of pointers. Passing arrays as arguments.

Strings and C string library.

Structures and Unions. Defining C structures, Giving values to members, Array of structure, Nested structure, passing strings as arguments.

File Handling.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Yashwant Kanetkar, “Let us C”, BPB Publications, 2nd Edition, 2001.
- “ANSI C” by E Balagurusamy.
- Herbert Schildt, “C: The complete reference”, Osbourne Mcgraw Hill, 4th Edition, 2002.
- V.Raja Raman, “Computer Programming in C”, Prentice Hall of India, 1995.

References:

- Kernighan & Ritchie, “C Programming Language”, The (Ansi C Version), PHI, 2nd Edition.
- J.B. Dixit, “Fundamentals of Computers and Programming in ‘C’.
- P.K. Sinha and Priti Sinha, “Computer Fundamentals”, BPB publication.

LIFE SCIENCES

Course Code: BTF 105

Credit Units: 02

Course Objective:

The objective of the course is to provide students an understanding of the very basic molecules of life-DNA, RNA, proteins and how these molecules, when form further complex molecules like carbohydrates, vitamins and lipids, then functioning of body takes place. Since technology is advancing in every field, emphasis is also given on the understanding of application of some biotechnological concepts used in our daily life like biofuels, biofertilizers. An introduction to the origin of earth, the environment-air, water and land, origin of life on Earth, how life evolved from a single cell, some environmental problems and measures to be taken to combat them.

Course Contents:

Module I: Cell Biology

Organization of cell (Inorganic-Water and Ions; Organic-Proteins, Lipids and Carbohydrates constituents)
Physical structure of the cell-Brief introduction to the Cell Membrane, Cytoplasm and its Organelles (Nucleus, Mitochondria, Golgi, Endoplasmic Reticulum, Lysosomes, Peroxisomes, Ribosomes, Chloroplasts)
Cell cycle.

Module II: Introduction to Cell Physiology

Transport of substances through the cell membrane- Osmosis, Diffusion and its types, Active transport (Sodium-potassium pump) and Passive transport
Membrane potential, Measuring Membrane Potential, Action Potential
Electrocardiogram (ECG)
Electromyography (EMG)
Electroencephalography (EEG)

Module III: Environmental Biotechnology

Biosensors, Biochips and Biofilms
GMO's and Biofertilizers
Biofuels
Gene Therapy, Stem cell and Nanobiomolecules
Bio Informatics- Introduction and Applications

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

- Fundamentals of Environmental Chemistry, G.S. Sodhi, Narosa Publishers
- Introduction to Environmental Pollution, B.K Sharma, H.Kaur, Goel Publishers.
- For Biochemistry, Styrier, Lalinger
- For Cell Biology, C B Pawar

ENVIRONMENT STUDIES

Course Code: BTF 106

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, water logging, 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.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

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:

Components	CT	HA	S/V/Q	A	EE
Weightage (%)	15	5	5	5	70

Text & References:

- Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
- Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad 380 013, India, Email:mapin@icenet.net (R)
- Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
- Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)

- Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumabai, 1196p
- De A.K., Environmental Chemistry, Wiley Eastern Ltd.
- Down to Earth, Centre for Science and Environment (R)
- Gleick, H.P. 1993. Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford Univ. Press. 473p
- Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
- Heywood, V.H & Waston, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press 1140p.
- Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi 284 p.
- Mckinney, M.L. & School, R.M. 1996. Environmental Science Systems & Solutions, Web enhanced edition. 639p.
- Mhaskar A.K., Matter Hazardous, Techno-Science Publication (TB)
- Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
- Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA, 574p
- Rao M N. & Datta, A.K. 1987. Waste Water treatment. Oxford & IBH Publ. Co. Pvt. Ltd. 345p.
- Sharma B.K., 2001. Environmental Chemistry. Geol Publ. House, Meerut
- 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)
- Wanger K.D., 1998 Environnemental Management. W.B. Saunders Co. Philadelphia, USA 499p

APPLIED PHYSICS LAB - I

Course Code: BTF 120

Credit Units: 01

Course Contents:

List of Experiments

1. To determine the wavelength of sodium light by Newtons'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 and a Callender & Grif/fth'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 and 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, and 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:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

APPLIED CHEMISTRY LAB - I

Course Code: BTF 121

Credit Units: 01

Course Contents:

1. Titration of phosphoric acid and sodium hydroxide solution using pH meter.
2. Verification and application of Beer's Law.
3. Spectroscopic analysis of iron in water sample.
4. Conductometric titration.
5. Determination of water modules of crystallization in Mohr's salt.
6. (A) Determination of surface Tension of liquid.
(B) Application of surface tension method in mixture analysis.
7. Application of distribution law in the determination of equilibrium constant.
8. Analysis of iron ore.
9. Plant pigments separation by paper chromatography.

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

PROGRAMMING IN C LAB

Course Code: BTF 122

Credit Units: 01

Course Contents:

SOFTWARE REQUIRED

Turbo C

Course Contents:

Module I

DOS commands

Module II

Creation of batch files

Module III

C program involving problems like finding the nth value of cosine series , Fibonacci series. Etc.

Module IV

C programs including user defined function calls

Module V

C programs involving pointers, and solving various problems with the help of those.

Module VI

File handling

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

ENGINEERING GRAPHICS LAB

Course Code: BTF 123

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 and will be capable of using various instruments involved in drawings.

Course Contents:

Module I: General

Importance, Significance and 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 and Lines

Introduction of planes of projection, Reference and auxiliary planes, projections of points and Lines in different quadrants, traces, inclinations, and true lengths of the lines, projections on Auxiliary planes, shortest distance, intersecting and non-intersecting lines.

Module III: Planes other than the Reference Planes

Introduction of other planes (perpendicular and oblique), their traces, inclinations etc., Projections of points and lines lying in the planes, conversion of oblique plane into auxiliary Plane and 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 and 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 and lines lying in the faces of the solid making given angles.

Module VI: Development of Surface

Development of simple objects with and without sectioning. Isometric Projection

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

Text & References:

- M.B. Shah & B.C. Rana, Engineering Drawing, Pearson Education, 2007
- 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”

Note: TA – Teacher’s Assessment, LR – Lab Record, V - Viva

ENGLISH

Course Objective:

The course is intended to give a foundation of English Language. The literary texts are indented 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 IX: 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 X: 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:

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

Text & References:

- Madhulika Jha, Echoes, Orient Long Man
- Ramon & Prakash, Business Communication, Oxford.
- Sydney Greenbaum Oxford English Grammar, Oxford.
- 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: BTF 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 charter 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

Text & References:

- Organizational Behaviour, Davis, K.
- Hoover, Judhith D. Effective Small Group and Team Communication, 2002, Harcourt College Publishers
- Dick, Mc Cann & Margerison, Charles: Team Management, 1992 Edition, viva books
- 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
- Lindzey, G. and Borgatta, E: Sociometric Measurement in the Handbook of Social Psychology, Addison – Welsley, US.
- Rose, G.: Oxford Textbook of Public Health, Vol.4, 1985.
- 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
- Smither Robert D.; The Psychology of Work and Human Performance, 1994, Harper Collins College Publishers

FRENCH - I

Course Code: BTF 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
2. autres, formules de politesse, rencontres
3. dire/interroger si on comprend
4. Nommer les choses

Unité 2: Faire connaissance

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

Unité 3: Organiser son temps

1. dire la date et l'heure

Contenu grammatical:

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

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- le livre à suivre : Campus: Tome 1

GERMAN - I

Course Code: BTF 145

Credit Units: 02

Course Objective:

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

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

Course Contents:

Module I: Introduction

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

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

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

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

Module II: Interviewspiel

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

Module III: Phonetics

Sound system of the language with special stress on Diphthongs

Module IV: Countries, nationalities and their languages

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

Module V: Articles

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

Module VI: Professions

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

Module VII: Pronouns

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

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

Module VIII: Colours

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

Module IX: Numbers and calculations – verb “kosten”

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

“Wie viel kostet das?”

Module X: Revision list of Question pronouns

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

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

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

SPANISH – I

Course Code: BTF 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras

JAPANESE - I

Course Code: BTF 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

Text:

- Teach yourself Japanese

References:

- Shin Nihongo no kiso 1

CHINESE – I

Course Code: BTF 148

Credit Units: 02

Course Objective:

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

Course Contents:

Module I

Show pictures, dialogue and retell.

Getting to know each other.

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

Practicing of Tones as it is a tonal language.

Changes in 3rd tone and Neutral Tone.

Module II

Greetings

Let me Introduce

The modal particle “ne”.

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

A brief self introduction – Ni hao ma? Zaijian!

Use of “bu” negative.

Module III

Attributives showing possession

How is your Health? Thank you

Where are you from?

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

Are you busy with your work?

May I know your name?

Module IV

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

Use of “zhe” and “na”.

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

How to make interrogative sentences ending with “ma”.

Structural particle “de”.

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

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

Module V

Family structure and Relations.

Use of “you” – “mei you”.

Measure words

Days and Weekdays.

Numbers.

Maps, different languages and Countries.

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

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

APPLIED MATHEMATICS – II

Course Code: BTF 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

Definition of a Matrix, Operations on Matrices Determinants, Elementary Operations, Reduction of a Matrix to Row Echelon Form, Rank of a Matrix, Consistency of Linear Simultaneous Equations, Gauss Elimination and Gauss Jordan –Method, Eigen values and Eigen Vectors of Matrix, Caley-Hamilton theorem, Diagonalization of a matrix.

Module II: Complex Number

Definition of Complex Number, Equality, Conjugate and Modulus of a Complex Number, Polar form of a Complex Number, De-Moivre's Theorem, Roots of a Complex Number, Exponential and Circular function of a Complex Number, Hyperbolic Functions and their inverses.

Module III: Vector Calculus

Scalar and vector field, Gradient, Divergence and Curl, Directional Derivative, Evaluation of a Line Integral, Green's theorem in plain (without proof), Stoke's theorem (without proof) and Gauss Divergence theorem (without proof)

Module IV: Probability and Statistics

Frequency Distribution, Arithmetic Mean, Median, Partition Values, Mode, Variance and Standard Deviation, Curve Fitting, Principle of least squares, Linear regression.

Introduction to Probability, Addition and Multiplication theorem of Probability, Random variables and Probability Distribution, Expected values, Binomial distribution, Poisson distribution and Normal Distribution and their Applications.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

- Higher Engineering Mathematics by H.K. Dass

APPLIED PHYSICS - II

Course Code:

BTF 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: Wave Mechanics

de-Broglie matter waves, wave nature of particles, phase and group velocity, Heisenberg uncertainty principle, wave function and its physics interpretation, Operators, expectation values. Time dependent & time independent Schrödinger wave equation for free & bound states, square well potential (rigid wall), Concept of step potential.

Module II: Atomic Physics

Vector atom model, LS and j-j coupling, Zeeman effect & Paschen-Back effect, Bragg's law, X-ray spectra and energy level diagram, Laser – Einstein coefficient, population inversion, condition of light amplification, He-Ne and Ruby laser

Module III: Solid State Physics

Sommerfield's free electron theory of metals, Fermi energy, Energy bands in solids, physics of semi-conductors, doping, intrinsic and extrinsic semiconductors, Depletion layer, characteristics of PN junction, Forward and reverse biasing, Breakdown voltage, Superconductivity, Meissner effect, Introduction to Nanomaterials

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

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

APPLIED CHEMISTRY - II

Course Code: BTF 203

Credit Units: 03

Course Objective:

Four basic sciences, Physics, Chemistry, Mathematics and Biology are the building blocks in engineering and technology. Chemistry is essential to develop analytical capabilities of students, so that they can characterize, transform and use materials in engineering and apply knowledge in their field. All engineering fields have unique bonds with chemistry whether it is Aerospace, Mechanical, Environmental and other fields the makeup of substances is always a key factor, which must be known. For electronics and computer science engineering, apart from the material, computer modeling and simulation knowledge can be inherited from the molecule designing. The upcoming field of technology like Nanotechnology and 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 starting from the very basic bonding mechanism to the application of materials.

Course Contents:

Module I: Water

Hardness of Water; Boiler Feed Water; Scale and Sludge; Softening of Water; External and Internal Treatment of Boiler Water; Domestic Water Treatment; Domestic Water Treatment; Desalination of Brackish Water; Chemical Analysis of Water; Dissolved O₂ (BOD, COD); Estimation of Free Chlorine; TDS.

Module II: Lubricants

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

Module III: Fuel

Introduction; Characteristics of good Fuel ; Calorific value; Bomb Calorimeter; Proximate and Ultimate analysis of coal; Carbonization of coal; Gasification and Liquefaction of coal: Fischer Tropsch and Bergius Process; Water Gas and Producer Gas

Module IV: Polymers

Introduction; Polymerization: Addition and Condensation Polymerization; Thermosetting and Thermoplastic Polymers; Molecular Weight of Polymer; Rubber, Plastic and Fiber; Preparation, Properties and uses of PMMA, Polyester, Epoxy Resins and Bakelite, Silicone Polymers.

Module V: Corrosion

Introduction, Mechanism of Dry and Wet Corrosion, Types of Corrosion, Galvanic Corrosion, Concentration Cell Corrosion, Passivity, Underground Soil Corrosion, Pitting Corrosion, Intergranular Corrosion, Waterline Influencing Corrosion, Corrosion Control.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Engineering Chemistry-Jain & Jain
- Engineering Chemistry- Shashi Chawla

References:

- Engineering Chemistry -Dara
- Engineering Chemistry -Sunita Ratan
- Polymer Science - Gowariker, Viswanathan Sreedhar
- Corrosion Engineering – Fontenna and Greene

OBJECT ORIENTED PROGRAMMING IN C++

Course Code:

BTF 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

Review of C, Difference between C and C++, Procedure Oriented and Object Oriented Approach. Basic Concepts: Objects, classes, Principals like Abstraction, Encapsulation, Inheritance and Polymorphism. Dynamic Binding, Message Passing. Characteristics of Object-Oriented Languages. Introduction to Object-Oriented Modeling techniques (Object, Functional and Dynamic Modeling).

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

Manipulating strings, Streams and files handling, formatted and Unformatted Input output. Exception handling, Generic Programming – function template, class Template Standard Template Library: Standard Template Library, Overview of Standard Template Library, Containers, Algorithms, Iterators, Other STL Elements, The Container Classes, General Theory of Operation, Vectors.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- A.R.Venugopal, Rajkumar, T. Ravishanker “Mastering C++”, TMH, 1997
- R. Lafore, “Object Oriented Programming using C++”, BPB Publications, 2004.
- “Object Oriented Programming with C++” By E. Balagurusamy.
- Schildt Herbert, “C++: The Complete Reference”, Wiley DreamTech, 2005.

References:

- Parsons, “Object Oriented Programming with C++”, BPB Publication, 1999.
- Steven C. Lawlor, “The Art of Programming Computer Science with C++”, Vikas Publication, 2002.
- Yashwant Kanethkar, “Object Oriented Programming using C++”, BPB, 2004

ELECTRICAL SCIENCE

Course Code: BTF 205

Credit Units: 02

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 law's 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

Basic Electrical definitions-Energy, Power, Charge, Current, Voltage, Electric Field Strength, Magnetic Flux Density, etc., Resistance, Inductance and Capacitance. Ideal Source, Independent Source and Controlled Source

Module II: Network Analysis Techniques & Theorems

Circuit Principles: Ohm's Law, Kirchoff's Current Law, Kirchoff's Voltage Law Network Reduction: Star-Delta Transformation, Source Transformation, Nodal Analysis, Loop analysis. Superposition theorem, Thevenin's Theorem, Norton's theorem and Reciprocity theorem.

Module III: Alternating Current Circuits

Peak, Average and 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:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

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

APPLIED PHYSICS LAB - II

Course Code: BTF 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:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

APPLIED CHEMISTRY LAB - II

Course Code: BTF 221

Credit Units: 01

Course Contents:

1. Determining the viscosity index of lubricating oil by using Redwood viscometer.
2. Determining the flash point and fire point of lubricating oil.
3. Determination of Hardness of Water.
4. Chemical Analysis of Water like Alkalinity, residual Chlorine.
5. Synthesis of Urea Formaldehyde resin.
6. Determination of Molecular weight of Polymer.
7. Determination of Ion exchange capacity of a region.
8. Determination of dissolved Oxygen in Water.
9. Determination of Iodine value in water.

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

OBJECT ORIENTED PROGRAMMING IN C++ LAB

Course Code: BTF 222

Credit Units: 01

Course Contents:

SOFTWARE REQUIRED

Turbo C++

- 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:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

ELECTRICAL SCIENCE LAB

Course Code: BTF 223

Credit Units: 01

Course Contents:

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 and verify R_{Th} , V_{Th} , R_N , I_N 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:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

ENGLISH

Course Code: BTF 240

Credit Units: 03

Course Objective:

The course is intended to give a foundation of English Language. The literary texts are indented 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 IX: 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 X: Poems

All the Worlds a Stage

To Autumn

O! Captain, My Captain.

Where the Mind is Without Fear

Psalm of Life

Shakespeare

Keats

Walt Whitman

Rabindranath Tagore

H.W. Longfellow

Examination Scheme:

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

Text & References:

- Madhulika Jha, Echoes, Orient Long Man
- Ramon & Prakash, Business Communication, Oxford.
- Sydney Greenbaum Oxford English Grammar, Oxford.
- Successful Communications, Malra Treece (Allyn and Bacon)
- Effective Technical Communication, M. Ashraf Rizvi.

BEHAVIOURAL SCIENCE - II

(PROBLEM SOLVING AND CREATIVE THINKING)

Course Code: BTF 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

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
- Richard Y. Chang and P. Keith, Kelly: Wheeler Publishing, New Delhi, 1998.
- Phil Lowe Koge Page: Creativity and Problem Solving, New Delhi, 1996
- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 3, Management (1996); Pfeiffer & Company
- Bensley, Alan D.: Critical Thinking in Psychology – A Unified Skills Approach, (1998), Brooks/Cole Publishing Company.

FRENCH - II

Course Code: BTF 244

Credit Units: 02

Course Objective:

To enable the students to overcome the fear of speaking a foreign language and take position as a foreigner speaking French.

To make them learn the basic rules of French Grammar.

Course Contents:

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

Module B: pp. 47 to 75 Unité 4, 5

Contenu lexical: Unité 3: Organiser son temps

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

Unité 4: Découvrir son environnement

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

Unité 5: s'informer

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

Contenu grammatical:

1. Adjectifs démonstratifs
2. Adjectifs possessifs/exprimer la possession à l'aide de :
 - i. « de »
 - ii. A+nom/pronom disjoint
3. Conjugaison pronominale – négative, interrogative - construction à l'infinitif
4. Impératif/exprimer l'obligation/l'interdiction à l'aide de « il faut... »/ «il ne faut pas... »
5. passé composé
6. Questions directes/indirectes

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- le livre à suivre : Campus: Tome 1

GERMAN – II

Course Code: BTF 245

Credit Units: 02

Course Objective:

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

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

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

Course Contents:

Module I: Everything about Time and Time periods

Time and times of the day.

Weekdays, months, seasons.

Adverbs of time and time related prepositions

Module II: Irregular verbs

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

Module III: Separable verbs

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

Treatment of such verbs with separable prefixes

Module IV: Reading and comprehension

Reading and deciphering railway schedules/school time table

Usage of separable verbs in the above context

Module V: Accusative case

Accusative case with the relevant articles

Introduction to 2 different kinds of sentences – Nominative and Accusative

Module VI: Accusative personal pronouns

Nominative and accusative in comparison

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

Module VII: Accusative prepositions

Accusative prepositions with their use

Both theoretical and figurative use

Module VIII: Dialogues

Dialogue reading: 'In the market place'

'At the Hotel'

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

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

SPANISH – II

Course Code: BTF 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras

JAPANESE - II

Course Code: BTF 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

Text:

- Teach yourself Japanese

References:

- Shin Nihongo no kiso 1

CHINESE – II

Course Code: BTF 248

Credit Units: 02

Course Objective:

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

Course Contents:

Module I

Drills
Practice reading aloud
Observe Picture and answer the question.
Tone practice.
Practice using the language both by speaking and by taking notes.
Introduction of basic sentence patterns.
Measure words.
Glad to meet you.

Module II

Where do you live?
Learning different colors.
Tones of “bu”
Buying things and how muchit costs?
Dialogue on change of Money.
More sentence patterns on Days and Weekdays.
How to tell time. Saying the units of time in Chinese. Learning to say useful phrases like – 8:00, 11:25, 10:30 P.M. everyday, afternoon, evening, night, morning 3:58, one hour, to begin, to end etc.
Morning, Afternoon, Evening, Night.

Module III

Use of words of location like-li, wais hang, xia
Furniture – table, chair, bed, bookshelf,.. etc.
Description of room, house or hostel room.. eg what is placed where and how many things are there in it?
Review Lessons – Preview Lessons.
Expression ‘yao’, ‘xiang’ and ‘yaoshi’ (if).
Days of week, months in a year etc.
I am learning Chinese. Is Chinese difficult?

Module IV

Counting from 1-1000
Use of “chang-chang”.
Making an Inquiry – What time is it now? Where is the Post Office?
Days of the week. Months in a year.
Use of Preposition – “zai”, “gen”.
Use of interrogative pronoun – “duoshao” and “ji”.
“Whose”??? Sweater etc is it?
Different Games and going out for exercise in the morning.

Module V

The verb “qu”
– Going to the library issuing a book from the library
– Going to the cinema hall, buying tickets
– Going to the post office, buying stamps
– Going to the market to buy things.. etc
– Going to the buy clothes Etc.
Hobby. I also like swimming.

Comprehension and answer questions based on it.

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

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

CELL BIOLOGY

Course Code: BTF 301

Credit Units: 03

Course Objective:

Cell biology plays a central role to connect the different fields of biotechnology, which is highly interdisciplinary. It incorporates elements of biology, maths, physics and chemistry with combination of computers and electronics. The object of the present course is to understand the structure and function of the cellular and sub cellular components of cells and tissues with the help of recent techniques.

Course Contents:

Module I

The cell theory, precellular evolution, Cell cycle - Molecular events and model systems, Regulators of cell-cycle

Module II

Various cell organelles and their organisation, structure and function

Module III

Introduction to the organs of cellular locomotion (cilia, flagella, microfilaments and microtubules)

Module IV

Membrane Transport: Ionic channels in plants and animals in correlation with diseases.

Module V

Signal Transduction: Introduction, Mechanisms, Cell-Cell signaling, Amplification of signals, Biotic and abiotic signals

Module VI

Cancer – Alteration of cell cycle, Forms of cancer with examples, genes involved in onset of cancer, cancer drugs. Apoptosis – Model of *C. elegans*, describing genes involved in cellular differentiation, Signal, pathways for apoptosis

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Essential Cell Biology : An Introduction to the Molecular Biology of the Cell, B. Alberts, D. Bray, A. Johnson,
- Cell and Molecular Biology by Gerald Karp, John Wiley and Sons Inc.

References:

- Cell in Development and Inheritance by E.B. Wilson, Macmillan
- Developmental Biology by S.F. Gilbert, Sinauer Associates Inc.
- J. Lewis, M. Roff, K. Robert, P. Walter and K. Roberts, Garland Publishing Company
- Molecular Cell Biology by H. Lodish, A. Berk, S.L. Zipursky, P. Matsudaura, D. Baltimore and J. Danell, W.H. Preman and Company.
- Cell and Molecular Biology by DeRobertis, B.I. Publication Pvt. Ltd.

BIOCHEMISTRY – I

Course Code: BTF 302

Credit Units: 03

Course Objective:

The course aims on understanding of the relationships between structure and function in the major classes of biopolymers. It augurs understanding on central metabolic process and the role of enzymes in modulating pathways. The theoretical background of biochemical systems helps to interpret the results of laboratory experiments.

Course Contents:

Module I

Introduction, Aim & Scope. Properties of water, acids, bases and buffers, covalent bonds, Non-covalent interactions in biological systems. Biomolecules and their separation techniques: Centrifugation, Chromatography – Paper and gel filtration.

Module II

Carbohydrates -Sugars; Polysaccharides; Glycoproteins -structure and function.

Module III

Carbohydrate metabolism - glycolytic pathway, fermentation, Pentose phosphate pathway, Citric acid cycle, Electron transport chain and oxidative phosphorylation, Glycogen breakdown and synthesis, control of glycogen metabolism, glycogen storage and its disease, Gluconeogenesis, glyoxylate pathway, Biosynthesis of Oligosaccharides and glycoproteins

Module IV

Lipids - classification, structure and function. Lipids and biological membranes. Transport across cell membranes; Lipid linked proteins and lipoproteins.

Module V

Lipid metabolism - Lipid digestion, absorption and transport, fatty acid oxidation, ketone bodies, fatty acid biosynthesis, regulation of fatty acid metabolism. Cholesterol and Arachidonic Acid metabolism

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Principles of Biochemistry by A.L. Lehninger, D.L. Nelson, M.M. Cox, Worth Publishing
- Biochemistry by L. Stryer, W.H. Freeman and Company

References:

- Cellular Biophysics I & II by Thomas F. Weiss 1995, MIT Press
- Biochemical calculations by I.H. Segal, John Wiley and Sons
- Biochemistry by C.K. Mathews, K.E. Van Holde and K.G. Ahern, Benjamin / Cummings.
- Devlin's Textbook of Biochemistry with Clinical correlations, John Wiley and Sons Inc.
- Harper's Biochemistry by K. Robert, M.D. Murray, D.K. Granner, P.A. Mayes and V.I. Rodwell, McGraw-Hill/Appleton and Lange.
- Tools of Biochemistry by T.G. Cooper, John Wiley and Sons Inc.

MICROBIOLOGY

Course Code: BTF 303

Credit Units: 03

Course Objective:

The course imparts the knowledge of different types of microorganisms that are invisible to our naked eyes. Discovery origin and evaluation of different forms of bacteria, fungi, protozoa and viruses constitute the basics of biotechnology.

Course Contents:

Module I

Fundamentals of microbiology -Discovery of the microbial world, controversy over spontaneous generation. Principles of microbial nutrition, Culture media, Pure culture techniques. Morphology, arrangement and detailed anatomy of bacterial cell.

Module II

Control of microorganisms- Physical agents, chemical agents, antibiotics and other chemotherapeutic agents

Module III

Microbial nutrition and growth -The definition of growth, mathematical expression of growth, growth curve, measurement of growth and growth yields, synchronous growth, continuous culture, culture collection and maintenance of cultures.

Module IV

Overview of metabolic diversity among microorganisms – Respiration, Photosynthesis in microorganisms; Calvin cycle; Chemolithotrophy; nitrate and sulfate reduction; methanogenesis and acetogenesis; nitrogen fixation.

Module V

Microbial diversity -**Bacteria:** Purple and Green bacteria, Cyanobacteria, Spirilla, Spirochetes, Lactic acid and propionic acid bacteria, Acetic acid bacteria, Endospore forming rods and cocci; Mycobacteria; Rickettsia, Chlamydia, Mycoplasma. **Viruses:** structure, classification and reproduction of bacterial, plant and animal viruses Virioids and prions. General account of **Fungi, Algae, Protozoa** and **Archaea**

Module VI

Microbial diseases – Bacterial Diseases: Typhoid, Bacillary dysentery, Cholera, Diphtheria, Tuberculosis, Tetanus. Viral diseases: Influenza, Measles, Poliomyelitis, Rabies, Hepatitis, AIDS. Protozoa Diseases: Amoebiasis, Malaria. Fungal diseases.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- General Microbiology by R.Y. Stanier, J.L. Ingraham, M.L. Wheelis and P.R. Painter, Macmillian
- Microbiology VI Edition by M.J. Pelczar, E.C.S. Chan and N.R. Kreig, Tata McGraw Hill

References:

- Principles of Microbiology by R.M. Atlas. Publisher Wm C. Brown
- The microbes – An Introduction to their Nature and Importance by P.V. Vandenmark and B.L. Batzing, Benjamin Cummings.
- The Microbial World by Roger Y. Stanier, Prentice Hall
- Microbiology by Tortora, Funke and Chase, Benzamin & Cummings
- Principles of Fermentation Technology by Salisbury, Whitaker and Hall, Aditya Books Pvt. Ltd.
- Industrial Microbiology by Casida, New Age International
- Industrial Microbiology by Prescott and Dunn, C.B.S. Publishers

BASICS OF COMPUTER SYSTEMS AND PROGRAMMING

Course Code: BTF 304

Credit Units: 04

Course Objective:

The aim of this course is two-folds. First to introduce the students to the basic concepts of computer science, and second to provide the students with a practical ability in scientific programming. The course will teach programming in C covering the standard elements of the language.

Course Contents:

Module I

C++ programming language – Classes and objects, Constructors and Destructors, Inheritance, Pointers, Virtual Functions, Polymorphism, Console IO operations, Data Files, Exception handling

Module II

Data Structures: - Linked list, doubly linked list, circular link list; stack implementation using array and linked list; Queue implementation using array & linked list; priority Queue

Module III

Traversal:- Preorder, Postorder, inorder; Tree: Binary tree, m-way tree, AVL tree,

Module IV

Sorting- Bubble sort, Insertion sort, Quick Sort, Selection sort, Merge sort; Searching: Linear search, Binary search

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Let Us C++ by KanetKar, BPB
- Algorithm and Data Structure, RS Salaria

References:

- A comprehensive guide to c++ by Aklecha , BPB
- Introduction to object oriented Programming and C++ by KanetKar,;BPB

INTERNET TECHNOLOGIES

Course Code: BTF 305

Credit Units: 02

Course Objective:

During this course, students learn basics of Internet and to use it for research/and educational purposes. They will be accustomed to web pages and will be able to browse using different browsers and different searching strategies. They will also be aware about the issues like safety, privacy, and exchanging information over electronic media etc.

Course Contents:

Module I

Introduction to Internet, its history, the working of Internet, components of Internet, Web sites and WebPages, Major protocols that make up the Web, the URL and the Domain Name System,

Module II

Web browsers, plug-ins, Active X, multimedia, A brief about Web programming languages and functions, Real-Time communication, Blogs and RSS

Browse using different browsers, Search Engines and searching the web, different searching strategies.

Module III

Awareness about cyber-crime, safety, privacy, and exchanging information over electronic media etc., Strategies for evaluating resources found on the Internet.

Module IV

Computer network, Types of computer networks, Network Topology, Different types of network topology with their advantages and disadvantages.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Bioinformatics: Databases and Systems, Stanley Letovsky
- Networking for Dummies by Lowe, Doug.

References:

- Introduction to Bioinformatics by Teresa Attwood, David Parry-Smith,
- Bioinformatics: Sequence, Structure and Databanks: A Practical Approach (The Practical Approach Series, 236), Des Higgins (Editor), Willie Taylor
- Bioinformatics: A Biologist's Guide to Biocomputing and the Internet, Stuart M. Brown
- All about computers for dummies by Gookin Dass
- Bioinformatics: Sequence and Genome Analysis, David W. Mount.

CELL BIOLOGY LAB

Course Code: BTF 320

Credit Units: 01

Course Contents:

Module I

Microscopy: Bright field, phase contrast and fluorescence microscopy.

Module II

Microtomy

Module III

Instrumental methods for Cell Biology

Module IV

Subcellular fractionation and marker enzymes

Module V

Histochemical techniques

Module VI

Mitosis and Meiosis

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

BIOCHEMISTRY - I AND MICROBIOLOGY LAB

Course Code: BTF 321

Credit Units: 02

Course Contents:

Module I

Colorimetric determination of pK.

Module II

Reactions of sugars.

Module III

Isolation, purity determination and quantitation of DNA.

Module IV

Quantitation of proteins.

Module V

Preparation of liquid and solid media. Isolation and maintenance of organisms by plating, streaking and serial dilution. Slants and slab cultures. Storage of micro-organisms.

Module VI

Growth-growth curve -measurement of bacterial population by turbidometry and dilution methods. Effect of temperature, pH and carbon and nitrogen sources.

Miroscopic examination of bacteria, yeast and molds and study of organisms by gram stain, acid fast stain and staining for spores.

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

COMPUTERS LAB - I

Course Code: BTF 322

Credit Units: 02

Course Contents:

Module I

OOPS: Implementation of classes using array and pointers; Implementation of constructor, destructor, Inheritance, polymorphism, Files

Module II

Array and linked list implementation of stack, queue

Module III

Implementation of different sorting and searching methods

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

INTERNET TECHNOLOGIES LAB

Course Code: BTF 323

Credit Units: 01

Course Contents:

- Different types of search engines, searching the web, various strategies for efficient searching.
- Using web-based tools, working with Biological sequences:
 - a) Conversions of sequence from one form to another (e.g., nucleic acid sequence to amino acid sequence etc.)
 - b) Finding out different parameters of a given sequence (e.g., composition, molecular weight, complement, reverse complement etc.).
- Referencing in Scientific literature and their practical usage.
- Format conversion of Biological sequences.
- Pubmed and relevant literature databases: Features and usage.

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

TERM PAPER

Course Code: BTF 330

Credit Units: 03

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 consists 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 magazines 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 ideas.

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:
- f) Show evidence of what an author has said.
- g) Avoid misrepresentation through restatement.
- h) Save unnecessary writing when ideas have been well expressed by the original author.
- i) 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

References

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

Crystal, D. (2001), *Language and the internet*. Cambridge: Cambridge University Press.

Edited Volumes

Gass, S./Neu, J. (eds.) (1996), *Speech acts across cultures. Challenges to communication in a second language*. Berlin/ NY: Mouton de Gruyter.

[(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

Schmidt, R./Shimura, A./Wang, Z./Jeong, H. (1996), *Suggestions to buy: Television commercials from the U.S., Japan, China, and Korea*. In: Gass, S./Neu, J. (eds.) (1996), *Speech acts across cultures. Challenges to communication in a second language*. Berlin/ NY: Mouton de Gruyter: 285-316.

Journal Articles

McQuarrie, E.F./Mick, D.G. (1992), *On resonance: A critical pluralistic inquiry into advertising rhetoric*. *Journal of consumer research* 19, 180-197.

Electronic Book

Chandler, D. (1994), *Semiotics for beginners* [HTML document]. Retrieved [5.10.'01] from the World Wide Web, <http://www.aber.ac.uk/media/Documents/S4B/>.

Electronic Journal Articles

Watts, S. (2000) *Teaching talk: Should students learn 'real German'?* [HTML document]. German as a Foreign

Language Journal [online] 1. Retrieved [12.09.'00] from the World Wide Web, <http://www.gfl-journal.com/>.

Other Websites

Verterhus, S.A. (n.y.), Anglicisms in German car advertising. The problem of gender assignment [HTML document]. Retrieved [13.10.'01] from the World Wide Web, <http://olaf.hiof.no/~sverrev/eng.html>.

Unpublished Papers

Takahashi, S./DuFon, M.A. (1989), Cross-linguistic influence in indirectness: The case of English directives performed by native Japanese speakers. Unpublished paper, Department of English as a Second Language, University of Hawai'i at Manoa, Honolulu.

Unpublished Theses/ Dissertations

Möhl, S. (1996), Alltagssituationen im interkulturellen Vergleich: Realisierung von Kritik und Ablehnung im Deutschen und Englischen. Unpublished MA thesis, University of Hamburg.

Walsh, R. (1995), Language development and the year abroad: A study of oral grammatical accuracy amongst adult learners of German as a foreign language. Unpublished PhD dissertation, University College Dublin.

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.)

COMMUNICATION SKILLS - I

Course Code: BTF 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:

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

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
- A Writer's Workbook Fourth edition, Smoke, Cambridge
- Effective Writing, Withrow, Cambridge
- Writing Skills, Coe/Rycroft/Ernest, Cambridge
- Welcome!, Jones, Cambridge

BEHAVIOURAL SCIENCE - III (INTERPERSONAL COMMUNICATION)

Course Code: BTF 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
Interact ional 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

Text & References:

- Vangelist L. Anita, Mark N. Knapp, Inter Personal Communication and Human Relationships: Third Edition, Allyn and Bacon
- Julia T. Wood. Interpersonal Communication everyday encounter
- Simons, Christine, Naylor, Belinda: Effective Communication for Managers, 1997 1st Edition Cassel
- Goddard, Ken: Informative Writing, 1995 1st Edition, Cassell
- 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: BTF 344

Credit Units: 02

Course Objective:

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

Course Contents:

Module B: pp. 76 – 88 Unité 6

Module C: pp. 89 to103 Unité 7

Contenu lexical: Unité 6: se faire plaisir

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

Unité 7: Cultiver ses relations

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

Contenu grammatical:

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

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- le livre à suivre : Campus: Tome 1

GERMAN - III

Course Code: BTF 345

Credit Units: 02

Course Objective:

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

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

Course Contents:

Module I: Modal verbs

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

Module II: Information about Germany (ongoing)

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

Module III: Dative case

Dative case, comparison with accusative case
Dative case with the relevant articles
Introduction to 3 different kinds of sentences – nominative, accusative and dative

Module IV: Dative personal pronouns

Nominative, accusative and dative pronouns in comparison

Module V: Dative prepositions

Dative preposition with their usage both theoretical and figurative use

Module VI: Dialogues

In the Restaurant,
At the Tourist Information Office,
A telephone conversation

Module VII: Directions

Names of the directions
Asking and telling the directions with the help of a roadmap

Module VIII: Conjunctions

To assimilate the knowledge of the conjunctions learnt indirectly so far

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

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

SPANISH – III

Course Code: BTF 346

Credit Units: 02

Course Objective:

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

Course Contents:

Module I

Revision of earlier semester modules

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

Weather

Module II

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

Module III

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

How to ask for directions (using *estar*)

Introduction to IR + A + INFINITIVE FORM OF A VERB

Module IV

Simple conversation with help of texts and vocabulary

En el restaurante

En el instituto

En el aeropuerto

Module V

Reflexives

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

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

JAPANESE - III

Course Code: BTF 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 continuous verbs etc

Module II

More Adverbs and adverbial expressions

Module III: Counters

Learning to count different shaped objects

Module IV: Tenses

Past tense, Past continuous tense.

Module V: Comparison

Comparative and Superlative degree

Module VI: Wishes and desires

Expressing desire to buy, hold, possess. Usage in negative sentences as well.

Comparative degree, Superlative degree.

Module VII: Appointment

Over phone, formal and informal etc.

Learning Outcome

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

Methods of Private study /Self help

- Handouts, audio-aids, and self-do assignments.
- Use of library, visiting and watching movies in Japan and culture center every Friday at 6pm.

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

Text:

- Teach yourself Japanese

References:

- Shin Nihongo no kiso 1

CHINESE – III

Course Code: BTF 348

Credit Units: 02

Course Objective:

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

Course Contents:

Module I

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

Module II

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

Module III

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

Module IV

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

Module V

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

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

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

BIOCHEMISTRY - II

Course Code:

BTF 401

Credit Units: 03

Course Objective:

The course aims on understanding of the relationships between structure and function in the major classes of biopolymers. It augurs understanding on central metabolic process and the role of enzymes in modulating pathways. The theoretical background of biochemical systems helps to interpret the results of laboratory experiments.

Course Contents:

Module I

Proteins: Amino acids and peptides - classification, chemical reactions and physical properties.
Nucleic acids - Nitrogenous bases, nucleotides, types, structure and properties of nucleic acids.

Module II

Biosynthesis of proteins

Module III

Amino acid metabolism -Amino acid deamination, urea cycle, amino acids as biosynthetic precursors, amino acid biosynthesis, Specialized Products of Amino Acids, Nitrogen fixation

Module IV

Nucleotide Metabolism - structure and metabolism of purines and pyrimidines, biosynthesis of nucleotide coenzymes; Heme and Porphyrin Metabolism

Module V

Enzymes: Introduction and scope, Nomenclature, Mechanism of Catalysis, Regulation of enzyme activity, Enzyme Kinetics: Single substrate steady state kinetics; King-Altman's method; Inhibitors and activators; Multi-substrate systems; Effect of pH and temperature; Allosteric enzymes.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Principles of Biochemistry by A.L. Lehninger, D.L. Nelson, M.M. Cox. Worth Publishing
- Biochemistry by L. Stryer. Publishers : W.H. Freeman and Company

References:

- Cellular Biophysics I & II by Thomas F. Weiss 1995, MIT Press
- Biochemical calculations by I.H. Segal. John Wiley and Sons
- Biochemistry by C.K. Mathews, K.E. Van Holde and K.G. Ahern. Benjamin / Cummings.
- Devlin's Textbook of Biochemistry with Clinical correlations. John Wiley and Sons Inc.
- Harper's Biochemistry by K. Robert, M.D. Murray, D.K. Granner, P.A. Mayes and V.I. Rodwell. McGraw-Hill/Appleton and Lange.
- Tools of Biochemistry by T.G. Cooper. John Wiley and Sons Inc.

MOLECULAR BIOLOGY

Course Code: BTF 402

Credit Units: 03

Course Objective:

The aim is to extend understanding of the molecular mechanisms via which genetic information are stored, expressed and transmitted among generations.

Course Contents:

Module I: DNA Replication

Prokaryotic and Eukaryotic DNA replication, Mechanism of DNA Replication, Enzymes and accessory proteins involved in DNA replication

Module II: Transcription

Prokaryotic transcription, Eukaryotic transcription, RNA polymerase, General and specific transcription factors, Regulatory elements and mechanism of transcription regulation

Module III: Modifications in RNA

5'-cap formation, transcription termination, 3'-end processing and polyadenylation, Splicing, Editing, Genetic Code and codon usage;

Module IV: Translation

Prokaryotic and Eukaryotic translation, Mechanisms of initiation, elongation and termination, regulation of translation.

Module V

Transcriptional gene silencing, post transcriptional gene silencing, antisense technology, co-suppression, RNA interference

Module VI: Protein Targeting

Synthesis of secretory and membrane proteins, Import into nucleus, mitochondria, chloroplast and peroxisomes,

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Gene VIII by Benjamin Lewin 2005. Oxford University Press

References:

- Concepts of Genetics by W.S. Klug, and M.R. Cummings 2004. Pearson Education
- Genome by T.A. Brown. John Willey & Sons Inc.
- Molecular Biology of the Cell by B. Alberts, D. Bray, J. Lewis, M. Raff, K. Roberts and J.D. Watson, Garland Publishing
- Molecular Cell Biology by H. Lodish, A. Berk, S. Zipursky, P. Matsundaira, D. Baltimore and J.E. Barnell. W.H. Freeman and Company.
- Molecular Cloning: A Laboratory Manual (3-Volume set) by J. Sambrook, E.F. Fritsch and T. Maniatis. Cold Spring Harbor Laboratory Press.
- Molecular Biology of the Gene by J.D. Watson, A.M. Weiner and N.H. Hopkins. Addison-Wesley Publishing.
- Introduction to Practical Molecular Biology by P.D. Dabre. John Wiley and Sons Inc.

COMPUTERS - II

Course Code: BTF 403

Credit Units: 03

Course Objective:

The objective of this course is to make students well versed with concepts and implementation of database systems, and visual basic, with an emphasis on bioinformatics applications.

Course Contents:

Section A: Database Concept with Oracle

Module I

Introduction to Database, RDBMS Vs DBMS, Normalisation.

Module II

Introduction to SQL, DDL, DML and DCL statements, Integrity Constraint. Functions(Aggregate , Character , date) , Views , joins,Sub Queries with Any and All ,Sequences, data Dictionary, SQL reports, generating SQL statements, Introduction to LOBS Controlling the user access.

Module III

Introduction to Database Programming With PL/SQL, Control Flow Statements (IF Statements and Loops), Cursors(Implicit and Explicit),Function and Procedures, data base Triggers, Packages, Exception Handling

Section B: Programming With Visual basic 6.0.

Module I

Introduction to Visual basic, Features, Control flow statements, Event handling (click, lost focus, Got focus, Change , load etc.), array, Control Array , Creating Function and Procedures, modules

Module II

Insert, update, delete and navigation of records using DAO and ADO.

Module III

Introduction to controls like file, Directory, drive, timer, ComboBox, List Box, Progress bar, Creation of MDI form, menu, toolbar ,status bar, Tabstrip control .

Module IV

Advanced Concepts: Chart control, Flex grid control, mapi control. Packing and deployment ,Data Project, DLL creation, ActiveX

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- SQL, PL/SQL – The programming Language by Ivan Bayross: BPB
- Visual basic to advanced by dasgupta, Publisher: BPB

References:

- Oracle programming with Visual basic by Snowdon
- Introduction to Oracle 9i by Thomas, Publisher :BPB
- Visual basic Developers Guide to ADO by Russel, Publisher: BPB

GENETICS

Course Code: BTF 404

Credit Units: 03

Course Objective:

The objective of the course is to focus on the basic principles of genetics incorporating the concepts of classical, molecular and population genetics. Compilation is required for recent advances in genetic principles for strong foundation in Biotechnology.

Course Contents:

Module I

The science of genetics -introduction, history, classical and molecular genetics, role of genetics in medicine, agriculture and society.

Module II

Mendelism -Mendelian inheritance and its applications, Mendelian principles in human genetics and in agriculture. Extension of Mendelism -Allelic variations, influence of environment on expression, penetrance and expressivity, epistasis, pleiotropy, genetic basis of continuous phenotypic variety. Chromosomal basis of inheritance; sex linkage,, crossing over and chromosome mapping in eukaryotes.

Module III

Simple sequence repeat loci, Southern and fluorescence in situ hybridization for genome analysis; RFLP, RAPD and AFLP analysis, molecular markers linked to disease resistance genes; Applications of RFLP in forensic, disease prognosis, genetic counseling, pedigree, varietal etc. Animal trafficking and poaching, germplasm maintenance, taxonomy and biodiversity.

Module IV

Mechanism of genetic change -mutation and mutagenesis

Module V

Concept of gene – classical and modern, pseudoallelism, position effect, intragenic crossing over & complementation (cistron, recon & nutron) Benzer's work on r II locus in T₂ bacteriophage

Module VI: Extranuclear Inheritance in Higher Plants.

Overview of the mitochondrial and chloroplast Genome with suitable examples.

Module VII: Genetics of Population

Hardy- Weinburg Law and its deviations.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Concepts of Genetics (Sixth Edition) by William S. Klug and Michael R, Cummings. Pearson Education
- Principles of Genetics by E J Gardner. John Wiley & Sons Inc.

References:

- Genetics by M. W. Strickberger. Prentice Hall College Division
- Genetics by P.J.Russell. Benjamin/Cummings
- Genetics by R. Goodenough. International Thomson Publishing
- Introduction to Genetic Analysis by A.J. F. Griffiths. W.H. Freeman and Company
- Principles of Genetics by D.P. Snustad & M.J. Simmons. John Wiley and Sons Inc.
- Molecular Biology of the Gene (Fifth Edition)by J.D. Watson, A.M. Weiner and N.H. Hopkins. Addison – Wesley Publishing
- Genetics by P.K. Gupta. Rastogi Publication

STATISTICS

Course Code: BTF 405

Credit Units: 03

Course Objective:

The course aims to develop competency and expertise in the application of statistical methods applied to biological data obtained in experimental techniques, methodology and the safe laboratory practice.

Course Contents:

Module I

The nature and scope of statistics, Introduction to Biostatistics

Module II

Preliminary concepts (Averages and dispersion), Probability theory, Bay's theorem, theoretical distributions (Binomial, Normal, Poisson) and their properties, WLLN, CLT

Module III

Introduction of few distribution (Rectangular, Exponential, Beta distribution of first and second kind, Gamma), Moments, Sampling techniques of attributes, estimation theory, test of significance for large and small samples.

Module IV

The Chi-Square Test (Standard error, Null hypothesis, Confidence limits, Degree of freedom, Fisher's F-test (analysis of variance)

Module V

Curve-fitting by method of least square, correlation, rank correlation and regression.

Module VI

Introduction to Demography and vital statistics, analysis of time series, interpolation and extrapolation, Markov chains

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Statistical Methods in Bioinformatics: An Introduction by G.R. Grant, W.J. Ewens. Springer Verlag.
- Fundamental of Biostatistics by Bernard Rosner. Oxford University Press

References:

- Introduction to Probability Theory by P.G. Hoel. Houghton Mifflin College
- Introduction to Statistical Theory by P.G. Hoel, S.C. Port, C.J. Schiller, R.A. Srinivasan, A. Srivivasan. McGraw-Hill Trade
- Schaum's Outline of Probability, Random Variables and Random Processes by H.P. Hsu. McGraw-Hill Trade.
- Mathematical Statistics by H.C. Saxena. S. Chand & Company
- Biometry – Case study by Nicholas Lange and Louise Ryan. John Wiley & Sons
- Statistics of Extremes by E.J. Gumbel. Columbia University Press.

CHEMICAL BIOLOGY

Course Code: BTF 406

Credit Units: 02

Course Objective:

Chemical biology is that branch of life science, which deals with the study and manipulation of biological systems through the application of chemical techniques and tools. It differs from the more traditional disciplines of chemistry and biology in its emphasis on integrating a wider series of experimental techniques, ranging from synthetic organic chemistry, to biochemistry, to structural, molecular, and cellular biology. Chemical biology has historical and philosophical roots in medicinal chemistry, supramolecular chemistry (particularly host-guest chemistry), bioorganic chemistry, pharmacology, genetics, biochemistry and metabolic engineering.

Course Contents:

Module I: Principles of chemical biology

Chemistry of carbohydrates, proteins and nucleic acids, strategies for identifying the cellular target of physiologically active natural products (paclitaxel, vancomycin), chemical aspects of signal transduction

Module II: Chemical reactions in living systems

Introduction to enzyme chemistry, Group transfer reactions, Substitutions, Carboxylation and decarboxylation, Isomerases, Eliminations and additions, Redox reactions (1), Redox reactions (2), Aldol and Claisen Reactions, One-carbon transfer reactions, Rearrangements

Module III: Structural chemical biology

Purine biosynthesis, polyamide biosynthesis, thiamine biosynthesis, vitamin E biosynthesis, proteases

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Chemical Biology by H. Gobind Khorana
- Chemical Biology: A practical course, Herbert Waldmann, Petra Janning, Wiley-VCH
- Foundations of Chemical Biology, C.M. Dobson, J.A. Gerrard, A.J. Pratt, Oxford Chemistry Primers
- Innovations in Chemical Biology, Sener Bilge, Springer
- Chemical biology by Stuart L. Shreiber, Tarun Kapoor, Gunther Wess, Wiley-VCH.

References:

- A General Method for Discovering Inhibitors of Protein–DNA Interactions Using Photonic Crystal Biosensors *Chem. Biol.*, 2008, 3 (7), pp 437–448.
- Optimization of non-natural nucleotides for selective incorporation opposite damaged DNA *Org. Biomol. Chem.*, 2007, 5, 3623 – 3630.

BIOCHEMISTRY LAB - II

Course Code: BTF 420

Credit Units: 01

Course Contents:

Module I

Proteins: Separation of proteins by SDS-PAGE

Module II

Enzyme: Enzyme activity study of serum alkaline phosphatase

Module III

Nucleic Acid:

Biochemical estimation of DNA

Biochemical estimation of RNA

Separation of DNA on Agrose gel.

Module IV

Lipids:

Blood Cholesterol estimation.

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

MOLECULAR BIOLOGY AND GENETICS LAB

Course Code: BTF 421

Credit Units: 02

Course Contents:

Module I

Preparation of DNA: genomic, Plasmid

Module II

Isolation of RNA: total RNA and mRNA

Module III

Bacterial transformation.

Module IV

Karyotype-discussion of human genetic disorders - Staining of plant cells to study chromosomes.

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

COMPUTERS LAB - II

Course Code:

BTF 422

Credit Units: 02

Course Contents:

Module I

Creation of table, Insert, Update, Delete records, Implementing the integrity constraint: Primary Key, Not null, Foreign Key, Check, Unique. Using Implicit function: Date, Character and Aggregate Function, Sub queries.

Module II

Implementing Views, joins: Equi, Inner and Outer, creation of sequences, SQL reports.

Generating SQL statements. User management :(Create user, alter user, object privileges, system, Privileges,grant ,revoke,Role)

Module III

PL/SQL: Control Statements, Writing programs using Cursor, Implementing Functions and Procedures, Implementing data base Triggers and Packages. PL/SQL Tables.

Module IV

Visual basic: Form Creations, Working with controls from tool bar. Data base programming with the ADO and DAO. Implementing Chart control, Flex grid, Modules, Functions, package and deployment of the project, Reports using data project. File Handling

Module V

ActiveX creation, DLL creation

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

COMMUNICATION SKILLS - II

Course Code: BTF 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:

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

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: BTF 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

Text & References:

- Vangelist L. Anita, Mark N. Knapp, Inter Personal Communication and Human Relationships: Third Edition, Allyn and Bacon
- Julia T. Wood. Interpersonal Communication everyday encounter
- Simons, Christine, Naylor, Belinda: Effective Communication for Managers, 1997 1st Edition Cassell
- Goddard, Ken: Informative Writing, 1995 1st Edition, Cassell
- 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 - IV

Course Code: BTF 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- le livre à suivre : Campus: Tome 1

GERMAN - IV

Course Code: BTF 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja , Deutsch Interessant- 1, 2 & 3

- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH - IV

Course Code: BTF 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

Coomercial/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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Español Sin Fronteras (Nivel – Elemental)

JAPANESE - IV

Course Code: BTF 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

Text:

- Teach yourself Japanese

References:

- Shin Nihongo no kiso 1

CHINESE – IV

Course Code: BTF 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”, “yiwai” (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 actin “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.

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- “Elementary Chinese Reader, Part-2” Lesson 31-38

STRUCTURAL BIOLOGY

Course Code: BTF 501

Credit Units: 03

Course Objective:

The course aims to provide an understanding of the principles and applications of proteins, enzymes and nucleic acids for their role in biochemical pathway as well as interactions among themselves.

Course Contents:

Module I: Chemistry of amino acids and peptides (side chain structure and function in protein folding and functionality)

Secondary structure of proteins -helices, sheets, loops and turns; Structural and functional proteins. Tertiary structure of proteins, homo and hetero-dimers, trimers and tetramers; forces governing protein-protein interactions; open tertiary structure; Classification of proteins; Structure and function of an antibody; structure of hemoglobin, muscle proteins; Sequence and structural motifs in proteins.

Module II: Protein-ligand interactions

Lock and key versus handshake mechanism of substrate recognition; structural basis of recognition; reaction mechanisms of enzymes, G-Protein coupled receptors.

Module III: Protein solubility, protein stability and stabilization

Salting in and salting out, Parameters affecting; enthalpic and entropic stabilization, mutations increasing stability, .helix capping; Native, partially denatured and denatured proteins; Protein denaturation, Physical and chemical denaturants; Refolding

Module IV: DNA structure

covalent structure of DNA, base pairing, hydrogen bonding, DNA melting and annealing, difference between AT and GC pairing, DNA models, The Watson Crick model; Crystal structure of B-DNA, major and minor groves, dyad symmetry, base pair stacking, propellor twist, A and Z- DNA, triple stranded DNA, telomeric sequences and structure, G-quartets, palindromic and tandem sequences, Base pair flipping and DNA bulges, DNA methylation; Protein-DNA interactions; drug-DNA interactions

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Introduction to Protein Structure by C. Branden and J Tooze. Garland Publishing Company
- Biochemistry by R.H. Abeles, P.A. Frey and W.A. Jencks. Jones and Bartlett

References:

- Essentials of Molecular Biology by D. Freifelder. Jones and Bartlett Publications
- Genes VII by B. Lewin. Oxford University Press
- Protein Structure by M. Perutz. Oxford University Press
- Proteins (Structures and Molecular Properties) by T.E. Creighton. Publishers : W.H. Freeman and Company
- Database Annotation in Molecular Biology by Arthur M. Lesk
- From Genes to Clones by E.L. Winnacker
- Genes & Genomes by M.S. Paul Berg
- Structure and Mechanism in Protein Science by Alan Fersht

COMPUTATIONAL BIOLOGY - I

Course Code: BTF 502

Credit Units: 03

Course Objective:

The aim is to provide practical training in bioinformatics methods including accessing the major public sequence databases, use of the different computational tools to find sequences, analysis of protein and nucleic acid sequences by various software packages. It also provides a step by step, theoretical and practical introduction to the development of useful tools for automation of complex computer jobs, and making these tools accessible on the network from a Web browser.

Course Contents:

Module I

PERL: Basic concepts, Programming with PERL.

Module II: Biological Databases

Format & Applications of Sequence and Structure databases of Nucleic Acids & Proteins (GENBANK, EMBL, DDBJ, PIR, UNIPROT, PDB, SCOP, CATH, PRINT, Pfam etc) Specialised databases.

Module III: Sequence Analysis

Introduction to DNA and protein sequence analysis, Translation, ORF finding, Local vs Global alignment, Pairwise Sequence Analysis, Multiple sequence Analysis, Scoring matrices, Analysis, Web based tools for sequence analysis.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

- Bioinformatics: Sequence and Genome Analysis, David W. Mount.
- Introduction to Bioinformatics, Teresa Attwood, David Parry-Smith.
- Sequence Analysis in a Nutshell: A Guide to Common Tools and Databases, Scott Markel, Darryl Leon.
- Introduction to Bioinformatics, Arthur M. Lesk, 2002, Oxford University Press
- Current Topics in Computational Molecular Biology (Computational Molecular Biology), Tao Jiang, Ying Xu, Michael Zhang (Editors)
- Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins, Second Edition, Andreas D. Baxevanis, B. F. Francis Ouellette.
- Bioinformatics: Sequence, Structure and Databanks: A Practical Approach (The Practical Approach Series, 236), Des Higgins (Editor), Willie Taylor (Editor).

IMMUNOLOGY

Course Code: BTF 503

Credit Units: 03

Course Objective:

Role of antibody engineering in biomedical applications and the importance of immuno genetics in disease processes, tissue transplantation and immune regulation are some of the areas of attributes of this course which can help the students to understand the biotechnology related to human kind.

Course Contents:

Module I: Introduction

Phylogeny of Immune System, Innate and acquired immunity, clonal nature of immune response Organization and structure of lymphoid organs Nature and Biology of antigens and super antigens Antibody structure and function; Types of immunity- innate, acquired, active and passive, antigen -antibody reactions, Major histocompatibility complex, BCR and TCR, generation of antibody diversity Complement system

Module II

Cells of the immune system; hematopoiesis and differentiation, lymphocyte trafficking, B-Lymphocytes, T - Lymphocytes, macrophages, dendritic cells, natural killer, lymphokines and lymphokine activated killer cells, eosinophils, neutrophils and mast cells

Module III

Regulation of immune response-antigen processing and presentation, generation of humoral and cell mediated immune responses, activation of B and T lymphocytes, cytokines and their role in immune regulation, T cell regulation and MHC restriction, immunological tolerance

Module IV

Cell mediated toxicity-mechanism of T cell and NK cell mediated lysis, and macrophage mediated cytotoxicity, Hypersensitivity, Autoimmunity

Module V

Tumor immunology, Immunity to infectious agents Transplantation accines, Idiotype Network hypothesis and synthetic vaccines.

Module VI

Immunological Techniques: Immuno diffusion, immuno-electrophoresis, ELISA, RIA, fluorescence activated cell sorter, Hybridoma technology and its applications.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Basic Immunology by A.K. Abbas and A.H. Lichtman. Saunders W.B. Company
- Fundamentals of Immunology by W. Paul. Lippincott Williams and Wilkins

References:

- Immunology by W.L. Anderson. Fence Creek Publishing (Blackwell).
- Immunology: A Short Course by E. Benjamin, R. Coico and G. Sunshine. Wiley-Leiss Inc.
- Immunology by Roitt. Mosby – Yearbook Inc.
- Kuby Immunology by R.A. Goldsby, T.J. Kindt, and B.A. Osborne. Freeman

RECOMBINANT DNA TECHNOLOGY

Course Code: BTF 504

Credit Units: 03

Course Objective:

A complete understanding of molecular techniques like DNA sequencing, restriction mapping, PCR for the cloning and expression of genes implication can be obtained through the course. The successful application of biotechnology largely depends on these advanced molecular techniques.

Course Contents:

Module I: Introduction to the subject and the tools used in RDT and vectors

Restriction endonuclease, methyltransferase, ligase, polymerase, kinase, phosphatase, nuclease, transferase, reverse transcriptase, linkers, adapters DNA, RNA and protein markers. Overview of cloning and expression vectors, plasmid, phage (lambda and M13), cosmid, phagemids.

Module II: Blotting techniques and hybridization

Southern, Northern and Western blotting techniques. Radioactive and non-radioactive probes.

Module III: Polymerase chain reaction (PCR)

Constituents and mechanisms of PCR, optimization of PCR condition, applications of PCR

Module IV: Cloning and selection of clones

Basic cloning experiment: Design of cloning strategy and stepwise experimental procedure including application of tools introduced in module I. Complementation, colony and plaque hybridization, restriction, PCR, plus-minus screening, immunoscreening.

Module V: Genomic and cDNA library

Construction of genomic and cDNA library, screening of libraries.

Module VI: Advanced techniques in RDT

Subtractive hybridization, gel retardation assay, DNase footprinting, *in vitro* transcription and translation, phage display, DNA sequencing (Maxam Gilbert, Sanger's and automated), protein engineering.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Recombinant DNA by J.D. Watson et al. W.H. Freeman and Company
- Principles of Gene Manipulation: An Introduction to Genetic Engineering by R.W. Old and S. B Primrose.

References:

- Molecular Biotechnology: Principles and Applications of Recombinant DNA by B.R. Grick and J.J. Pasternak. ASM Press
- Molecular and Cellular Cells Methods in Biology and Medicine by P.B> Kaufman, W. Wu, D. Kim and C.J. Cseke. CRC Press.
- Milestones in Biotechnology: Classic Papers on Genetic Engineering by J.A. Bavies and W.S. Reznikoff.
- Butterworth Heinemann.
- Gene Expression Technology by D.V. Goeddel in Methods in Methods in Enzymology. Academic Press Inc.
- DNA Cloning: A Practical Approach by D.M. Glover and B.D. Hames. IRL Press.
- Molecular Cloning: A Laboratory Manual by J. Sambrook, E.F. Fritsch and T. Maniatis. Cold Spring Harbor Laboratory Press.

COMPUTERS – III

Course Code: BTF 505

Credit Units: 03

Course Objective:

It enables the students to access biological information networks and databases in order to understand the different techniques of biotechnology to build detection systems especially in the prevention and treatment of human diseases. It will enable them to interact with the Linux GUI and command line interface. It also provides a step by step, theoretical and practical introduction to the development of useful tools for automation of complex computer jobs, and making these tools accessible on the network from a Web browser.

Course Contents:

Section A: Web page Designing

Module I

Introduction to HTML, Tags for bold, italic, underline, list, marque, inserting images, Hyperlinks, Paragraphs, Heading, Font, table creation with rowspan and colspan, Form tag, frameset, Mapping a Image

Module II

Introduction to Active Server Pages, Working with variables, Understanding VBScript control Structure, Vbscript Built in Functions, Working with objects (Response, Request, Application Session, server, ASP Server Object. Insert, update, delete record from a database-using ADO. Creation of Mail Server using SMTP protocol, paging

Module III

Simple Animation creation using Flash.

Section B: Linux

Module I

Introduction to Operating system, Functions of an OS, Features of Linux, Introduction to Kernel and Shell of Linux, Directory Structure, Shell commands for Directory and Files.

Module II

Working with the vi and Pico Editors Shell commands:- wc, sort, tail finger, find, diff, comm.,cut ,cp Paste, grep, Tee, ps, kill, in, who, tty who, who am I, su, chown,chmod, date, unique, touch, file.

Module III

Introduction to Shell script, shell variables, System variables, Control statements, Global variables, positional Parameters, set command, shift command

Module IV

System administrations: create, update and delete a user, Modifying and deleting groups. Introduction to file System, Mounting and unmounting the file system, FSCK command, creating a file system using FDISK Command, Back tips, back up schedule, Back up Tools.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- ASP in 21 Days by Scott Mitchell, James Atkinson publisher SAMS
- Red Hat linux 6 fast and Easy by WitherSpoon, Publisher BPB

References:

- ASP 3.0 A Beginner's Guide by Mercer, TataMcGraw Hill
- Linux Complete by Sybex, BPB
- Learning macromedia Flash 5 by Weixel Publisher: BPB
- Teach your self macromedia Flash 5 in 24 Hours by Kerman Publisher: BPB

STRUCTURAL BIOLOGY LAB

Course Code: BTF 520

Credit Units: 01

Course Contents:

Module I

Chemical modification of proteins

Module II

Peptide mapping

Module III

Analysis of amino acid composition.

Module IV

Analysis and interpretation of Spectrophotometric data for denaturation studies.

Module V

Crystallization of Lysozyme -pH driven and salt driven crystallization.

Module VI

Effect of concentration. BMCD

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

COMPUTATIONAL BIOLOGY LAB - I

Course Code: BTF 521

Credit Units: 01

Course Contents:

The coursework for this practical session will follow the theory syllabus.

Module I

Programming with PERL.

Module II

Biological Databases: Format & Applications of Sequence and Structure databases of Nucleic Acids & Proteins(GENBANK, EMBL, DDBJ, PIR, UNIPROT, PDB, SCOP, CATH, PRINT, Pfam etc) Specialised databases.

Module III

DNA & Protein Sequence Analysis.

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

IMMUNOLOGY LAB

Course Code: BTF 522

Credit Units: 01

Course Contents:

Module I

Blood film preparation and identification of cells.

Module II

Lymphoid organs and their microscopic organization.

Module III

Immunization, collection of serum.

Module IV

Purification of IgG from serum.

Module V

Separation of mononuclear cells by Ficoll-Hypaque.

Module VI

Con-A induced proliferation of thymocytes (by MTT method).

Module VII

Elisa.

Module VIII

Hapten conjugation and quantitation.

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

RECOMBINANT DNA TECHNOLOGY LAB

Course Code: BTF 523

Credit Units: 01

Course Contents:

Module I

Quantitation of nucleic acids.

Module II

Construction of restriction map of plasmid DNA.

Module III

Bacterial expression system and Analysis

Module IV

Blotting techniques.

Module V

PCR amplification.

Module VI

Web-based tools for restriction mapping, Primer design tools on the web, DNA sequencing and fragments assembly tools like Sequencher, Phred, Phrap, and Consed etc.

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

COMPUTERS LAB – III

Course Code: BTF 524

Credit Units: 01

Course Contents:

Module I

Designing the Static web pages using HTML, Front page.

Module II

Designing the Dynamic web pages using ASP: Insert update delete and retrieval of records from a Database(Oracle,SQL server, Ms –Access) through HTML.

Module III

Sending and receiving mail using SMTP. Designing a page using paging.

Module IV

Working with Linux commands like: ls, wc, sort, tail finger, find, diff, comm.,cut ,cp Paste, grep, Tee, ps, kill, in, who, tty who, who am I, su, chown,chmod, date, unique, touch, file.

Module V

Designing the Shell Scripts, create, update and delete a user, Modifying and deleting groups.

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

COMMUNICATION SKILLS - III

Course Code: BTF 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:

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

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: BTF 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

Text & References:

- Organizational Behaviour, Davis, K.
- Hoover, Judhith D. Effective Small Group and Team Communication, 2002, Harcourt College Publishers
- Dick, Mc Cann & Margerison, Charles: Team Management, 1992 Edition, viva books
- Bates, A. P. and Julian, J.: Sociology - Understanding Social Behaviour
- Dressers, David and Cans, Donald: The Study of Human Interaction
- Lapiere, Richard. T – Social Change
- Lindzey, G. and Borgatta, E: Sociometric Measurement in the Handbook of Social Psychology, Addison – Welsley, US.
- Rose, G.: Oxford Textbook of Public Health, Vol.4, 1985.
- 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
- Smither Robert D.; The Psychology of Work and Human Performance, 1994, Harper Collins College Publishers

FRENCH - V

Course Code: BTF 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1

GERMAN - V

Course Code: BTF 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 prepositions 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.

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

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

SPANISH - V

Course Code: BTF 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Español Sin Fronteras, Greenfield

JAPANESE - V

Course Code: BTF 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 through out. 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 through out.
- 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

Text:

- Teach yourself Japanese

References:

- Shin Nihongo no kiso 1

CHINESE – V

Course Code: BTF 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, good 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- “Elementary Chinese Reader ” Part-II Lesson 39-46

SUMMER PROJECT - I

Course Code: BTF 560

Credit Units: 06

GUIDELINES FOR SUMMER PROJECT

The main objective of Summer Project is to familiarize students to laboratory environment and make them learn to handle equipments and softwares, design experiments and analyze the results. The student will be supervised by one or more faculty members and he or she will be required to submit a synopsis. While writing a synopsis emphasis should be given to make it publishable. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student. Initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include

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

Report Layout

The report should contain the following components:

- TITLE PAGE
- CERTIFICATE
- ACKNOWLEDGEMENT
- ABBREVIATIONS
- CONTENTS WITH PAGE NUMBERS
- CHAPTER –
 - a. INTRODUCTION
 - b. REVIEW OF LITERATURE
 - c. MATERIALS & METHODS
 - d. RESULTS & DISCUSSION
 - e. SUMMARY AND CONCLUSION
 - f. REFERENCES
 - g. APPENDIX (OPTIONAL)
- 1 inch Margin on left side & 1”each on other sides.
- Single side of the paper to be used.
- Times New Roman.

Font Size

- 12 (Bold for headings)
- 12 (Normal for Matter)
- 14 (for Chapter Names)
- 1.5 line spacing
- Numbering on the right hand Top of the page
- Numbers on pages before chapters to be done in Roman at the bottom of the page

References

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

Examples

For Research Article

Voravuthikunchai SP, Lortheeranuwat A, Ninprom T, Popaya W, Pongpaichit S, Supawita T. (2002) Antibacterial activity of Thai medicinal plants against enterohaemorrhagic *Escherichia coli* O157: H7. *Clin Microbiol Infect*, 8 (suppl 1): 116–117.

For Book

Kowalski, M.(1976) Transduction of effectiveness in *Rhizobium Meliloti*. SYMBIOTIC NITROGEN FIXATION PLANTS (editor P.S. Nutman IBP), 7: 63-67

- Scientific names in Italics
- Cover Page containing - Title, Students Name, Supervisors Name, University, Name (along with logo), Course name & year of Submission in the prescribed format
- 2 copies to be submitted

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution.. Evaluation will compose of two components - Project report assessment and Viva - voce. Project report assessment will be done by the two internal faculty members in respective fields. A committee of three faculty members will conduct Viva-voce.

Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project will be assessed as per evaluation format.

Examination Scheme:

Dissertation	50
Viva Voce	50
Total	100

GENOMICS

Course Code: BTF 601

Credit Units: 03

Course Objective:

The objective is to explain the structure, function, replication and evolution of eukaryotic genomes. Emphasis will be on current gene expression profiling techniques, different tools for analysis of human genomes

Course Contents:

Module I

Introduction to Genomics, Size and structure of genomes in different organisms, comparative genome analysis.

Module II

Databases and web based resources for genomics research and analysis.

Module III

Gene expression profiling, identification of genes, data analysis-statistical & clustering, Applications of Gene expression profiling

Module IV: Human Genome

Tools for analysis of human genome, Alternative splicing models, Probing with ESTs, Exon Microarray, Implications in Cancer genetics, SNPs, Pharmacogenomics

Module V

Microarray Technologies

Introduction, DNA microarrays, Basics of designing a microarray, Image analysis, Normalization Variability and replication, Clustering, Microarray Databases

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Introduction to Computational Molecular Biology, Joao Meidanis, Joao C. Setabal,
- Genomes, Terence A. Brown

References:

- Handbook of Comparative Genomics: Principles and Methodology, Cecilia Saccone, Graziano Pesole
- Sequence - Evolution - Function: Computational Approaches in Comparative Genomics, Eugene V. Koonin, Michael Y. Galperin
- Comparative Genomics - Empirical and Analytical Approaches to Gene Order Dynamics, Map Alignment and the Evolution of Gene Families, David Sankoff and Joseph H. Nadeau, Comparative Genomics, Melody Clark
- Bioinformatics: Sequence and Genome Analysis, David W. Mount.
- Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins, Second Edition, Andreas D. Baxeavanis, B. F. Francis Ouellette.

COMPUTATIONAL PROTEOMICS

Course Code: BTF 602

Credit Units: 03

Course Objective:

The broad objective of this course is to describe basic principles of protein structure including protein structure motifs, properties of alpha helices and beta sheets and protein folding. The aim is to explain to the students how a protein's conformation determines its biochemical activity, how a protein's structure enables binding to other molecules and how a protein's function can be deduced from its primary structure. It describes the techniques used for solving the 3-D structure of a protein.

Course Contents:

Module I: Introduction to Proteomics

Introduction to Proteome analysis, 2D-gel electrophoresis, high-throughput proteome analysis with 2D-IEF, chromatography-HPLC, GC; amino acid sequencing, mass spectrometry,.

Module II

Structure function relationship

Protein-protein interactions – Large molecular complexes – RNA polymerase II, ribosome; SUMO Protein-protein interactions in health and disease; Posttranslational modifications – concepts of how protein function is rapidly and dynamically modulated through posttranslational modifications, how posttranslational modifications precede altered transcription levels.

Module III

Structure determination – experimental and theoretical methods for determination of protein molecular size, X-ray diffraction technique, NMR spectroscopy, Databases for protein structures.

Module IV

Protein Engineering Techniques

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

- Introduction to Protein Structure by Carl-Ivar Branden, John Tooze
- Principles of Protein structure by Schultz, G. E., and Schirmer, R. H., Proteomics by Daniel C. Leibler
- Proteins: Structures and Molecular Principles (2d ed.). by TE Creighton
- Organic spectroscopy by William Kemp
- Proteome Research: Two-Dimensional Gel Electrophoresis and Detection Methods (Principles and Practice), T. Rabilloud (Editor), 2000, Springer Verlag
- Bioinformatics: A practical guide to the analysis of genes and proteins by A.D. Baxevanis and B.F.F. Ouellette. John Wiley and Sons Inc.
- Bioinformatics: From Genomes to Drugs by T. Lengauer. John Wiley and Sons Inc.
- Bioinformatics: Sequence and Genome Analysis by D.W. Mount. Cold Spring Harbor Laboratory Press
- Database Annotation in Molecular Biology : Principles and Practice by Arthur M. Lesk
- Proteomics by T. Palzkill. Publisher: Kluwer Academic Publishers

COMPUTATIONAL BIOLOGY - II

Course Code: BTF 603

Credit Units: 03

Course Objective:

The objective is to describe how molecular data can be used to construct a phylogenetic tree and Characterize the rates and causes of nucleotide substitutions. The aim is also to explain how a gene/protein family arises and the mechanisms which underlie evolution at the molecular level.

Course Contents:

Module I: Phylogenetic prediction

Trees-splits and metrics on trees, tree interpretation, Distance – additive, ultrameric and nonadditive distances, tree building methods, phylogenetic analysis, parsimony, tree evaluation, maximum likelihood trees – continuous time markov chains, estimating the rate of change, likelihood and trees; analysis software.

Module II

Predictive methods using protein sequences – protein identification, physical properties, motifs and patterns, 3D-structure prediction techniques, folding classes, structure classification;

Module III

Systems Biology

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

- Algorithms on Strings, Trees, and Sequences: Computer Science and Computational Biology by D. Gusfield. Publisher: Cambridge University Press
- Biocomputing hypertext coursebook at <http://www.techfak.unibielefeld.de/bcd/Curric/welcome.html/>
- Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins A.D. Baxevanis and B.F.F. Ouellette. Publisher: Wiley-interscience.
- Bioinformatics: Sequence and Genome Analysis by D.W. Mount. Cold Spring Harbor Laboratory Press
- Computational Modeling of Genetic and Biochemical Networks by J.M. Bower and H. Bolouri. MIT Press
- Computational Molecular Biology: An Algorithmic Approach by P.A. Pevzner. Publisher: MIT Press
- Computer Methods for Macromolecular Sequence Analysis by R.F. Doolittle, J.N. Abelson, M.I. Simon. Publisher: Academic press
- Essentials of Genomics and Bioinformatics by C.W. Sensen. John Wiley and Sons Inc.
- Introduction to Bioinformatics by T. Attwood and D. Parry-Smith. Prentice Hall
- Introduction to Computational Biology: Maps, Sequences and Genomes by M. Waterman. Chapman and Hall
- Sequence Analysis in Molecular Biology: Treasure Trove or Trivial Pursuit by G. V. Heijne and G.V. Heijne. Academic Press

BIOINFORMATICS ALGORITHMS

Course Code: BTF 604

Credit Units: 03

Course Objective:

The objective of this course is to provide exposure to students to the broad range of algorithms in the field of bioinformatics. It is important to acquire a knowledge of the algorithms employed in various software systems to have the ability to understand and evaluate them rather than just use them.

Course Contents:

Module I

Introduction to algorithms, Difference between – Biological vs Computer algorithms, Correct vs Incorrect algorithms, Iterative vs Recursive algorithms, Fast vs Slow algorithms, Tractable vs Intractable problems.

Module II

Big-O notation, Brief about the different types of algorithm design techniques (Exhaustive search, Branch-and-Bound algorithms, Greedy algorithms, Dynamic programming, Divide-and-Conquer algorithms, Machine Learning, Randomized algorithms)

Module III

Neural Network, Hidden Markov Models.

Module IV

Dynamic programming – its background (sequence alignment – local, global, Gap penalties, scoring of alignments), Needleman-Wunch algorithm, Smith-Waterman algorithm.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

- Algorithms on Strings, Trees, and Sequences: Computer Science and Computational Biology by D. Gusfield. Cambridge University Press
- Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins by A.D. Baxevanis and B.F.F. Quellerie. Wiley – interscience.
- Bioinformatics: Sequence and Genome Analysis by D.W. Mount. Cold Spring Harbor Laboratory Press.
- Essentials of Genomics and Bioinformatics – by C.W. Sensen. John Wiley and Sons
- Introduction to Bioinformatics by T. Attwood and D. Parry-Smity. Prentice Hall
- Sequence Analysis in Molecular Biology: Treasure Trove or Triviabl Pursuit by G. Von Heijne and G. Von Heijne. Academic Press.

COMPUTERS – IV

Course Code: BTF 605

Credit Units: 03

Course Objective:

The objective is to introduce students to a modern programming language and help them gain sufficient fluency to undertake research projects with a programming component; to lay the foundations for more advanced study of object-oriented languages

Emphasis is on to understand the basic concepts of programming; to learn the syntax and semantics of Java; to be able to use a program development environment

Course Contents:

Module I: (Core Java)

Introduction to Java - Features, Inheritance, Strings, Packages , Interfaces; Multi- Threading, Applet Programming; AWT- Components, Menus, Layout manager, etc., Event Handling, Swings , Java Packages - java.util, -java.io; exception handling,

Module II

JDBC

Introduction to Client Server Application

Java Drivers

java.sql Package

Executing SQL Statements

Module III

Java Servlets

Introduction to Server Side Application Development

Basics of Servlet Programming

Web Container

Session Tracking

Servlet Context

Module IV

JSP - Java Server Pages

JSP and Servlets (Differences and Similarity)

JSP details -directives, scriptlets, expressions, JSP tags

Module V: Basics of XML

Features & uses of XML.

Parsers, Entities, Attributes

DTD

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

- Complete reference by Herbert Schildt TataMcGraw Hill
- Programming with java A Primer by Balagurusamy Publisher: TataMcGraw Hill
- The complete Guide to java by Siple.TataMcGraw Hill

GENOMICS LAB

Course Code: BTF 620

Credit Units: 01

Course Contents:

All the lab. work would be done using Web based tools.

Module I

Comparative genome analysis.

Module II

Databases and web based resources for genomics research and analysis.

Module III

Gene expression profiling & Applications of Gene expression profiling

Module IV

Tools for analysis of human genome

Module V

Web based resources for Microarray Technologies

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

COMPUTATIONAL PROTEOMICS LAB

Course Code: BTF 621

Credit Units: 01

Course Contents:

The coursework for this practical session will follow the theory syllabus.

Module I

Protein identification, physico-chemical properties, motifs and patterns, structure, folding classes, structure classification

Module II

Databases for 2D GEL and MS data.

Module III

Web based Graphics Visualisation and analysis tools like Protein Explorer.

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

COMPUTATIONAL BIOLOGY LAB - II

Course Code: BTF 622

Credit Units: 01

Course Contents:

Module I

Motif and pattern searching

Module II

Phylogentic prediction and analysis

Module III

3D-Structure prediction tools

Module IV

Protein structure classification resources

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

BIOINFORMATICS ALGORITHMS LAB

Course Code: BTF 623

Credit Units: 01

Course Contents:

The coursework for this practical session will follow the theory syllabus.

1. Practical usage of different algorithms with special emphasis given to Needleman-Wunch algorithm and Smith-Waterman algorithm.
2. Practical usage of Graph theory.

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

COMPUTERS LAB - IV

Course Code: BTF 624

Credit Units: 02

Course Contents:

The coursework for this practical session will follow the theory syllabus.

Module I

Class, Object, Inheritance, Packages, Multithreading, Exception Handling, Strings.

Module II

Designing User interface using AWT, Swings

Module III

Developing Event Handling programs

Module IV

Developing Java programs to Interact with the Database: Fetching, retrieval, updation and deletion of the Records from the database like Oracle, SQL Server, and Ms Access.

Module V

Client server computing with JSP and Servlets

Module VI

Designing the XML program using DTD

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

COMMUNICATION SKILLS - IV

Course Code: BTF 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:

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

CAF – Communication Assessment File

GD – Group Discussion

GP – Group Presentation

- 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

BEHAVIOURAL SCIENCE - VI (STRESS AND COPING STRATEGIES)

Course Code: BTF 643

Credit Units: 01

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 interact ional 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

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

FRENCH - VI

Course Code: BTF 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- le livre à suivre : Campus: Tome 1

GERMAN - VI

Course Code: BTF 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

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

SPANISH – VI

Course Code: BTF 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras

JAPANESE - VI

Course Code: BTF 647

Credit Units: 02

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:

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

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.

CHINESE – VI

Course Code: BTF 648

Credit Units: 02

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 in 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Elementary Chinese Reader Part-2 ,3 ; Lesson 47-54

CLINICAL DATA MANAGEMENT

Course Code: BTF 701

Credit Units: 03

Course Objective:

Students will gain a solid understanding of Good Clinical Practices (GCP) and will explore ways of implementing GCP, including risk assessment and trial monitoring.

Course Contents:

Module I

Introduction to Disease Processes.

Module II: Fundamentals of clinical trials

Fundamental principles of comparative clinical trials in investigating effectiveness, efficacy and safety of treatments, benefits of clinical trials in comparison to alternative study designs, Main features of clinical trials, Key decisions surrounding design (including sample size), delivery and assessment of clinical trials.

Module III

Basic statistics for clinical trials, How to select and apply appropriate statistical methods to analyse data from clinical trials, presenting, interpreting and discussing the analyses clearly and concisely.

Module IV: Clinical trials in practice

Key steps in implementing a clinical trial ,clarifying and operationalising the primary and secondary objectives of clinical trials, the implications of design choices for implementation of a trial, trial governance, clearances (including research and ethical clearance), and data collection and recruitment methods. Quality assurance and control, data processing, management issues including post-trial monitoring.

Module V

Reporting and reviewing clinical trials

Module VI: Protocol development

Steps to be taken for preparing the protocol for a trial, including data collection forms, logistical and budgetary issues, and procedures of different funding bodies.

Module VII: Trial designs

Use of different trial designs such as non-inferiority and equivalence, cross-over, factorial, multi-armed and cluster randomised trials

Module VIII: Data monitoring and interim analyses

Issues relating to the on-going monitoring of the data in a study in order that sufficient data are available to answer the trial's question reliably without recruiting more patients than necessary, or exposing them to unacceptable risks.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

- Clinical Data Management Richard K. Rondel (Editor), Sheila A. Varley (Editor), Colin F. Webb (Editor)
- Practical Guide to Clinical Data Management by Susanne Prokscha
- Design and Analysis of Clinical Trials : Concepts and Methodologies (Wiley Series in Probability and Statistics)by: Shein-Chung Chow, Jen-Pei Liu

DATA MINING

Course Code: BTF 702

Credit Units: 03

Course Objective:

The course is designed to introduce data mining and its related elements to the students. In striving to achieve this objective, the course uses besides others, lectures on various important aspects like Graph theory, different algorithms etc.

Course Contents:

Module I

Knowledge Discovery in Databases, Concept of datamining, Need of datamining, Data mining functionalities.

Module II

Concept of Data Warehouse, Data Warehouse Architecture, Online Analytical Processing (OLAP), Development of Data Warehouse life cycle.

Module III

Data preprocessing, Basic methods of data cleaning, data integration and Transformation, Data reduction, Discretization and Concept Hierarchy Generation

Module IV

Data mining Primitives, Data Mining Query Language, Mining Complex Type of data: Multimedia database, Mining Spatial database, Mining text database, Architecture of data mining system, multidimensional data mining

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

- Data Mining: Multimedia, Soft Computing, and Bioinformatics by Mitra, Sushmita Acharya, Tinku, John Wiley & Sons Inc
- Bioinformatics: The Machine Learning Approach by Pierre Baldi, Sren Brunak
- Data Mining in Bioinformatics, Series: Advanced Information and Knowledge Processing, by Wang, J.T.L.; Zaki, M.J.; Toivonen, H.T.T.; Shasha, D.E. (Eds.)2005, XI, 340 p. , Springer publications

SAS (STATISTICAL ANALYSIS SYSTEM) AND R

Course Code: BTF 703

Credit Units: 02

Course Objective:

SAS software provides a complete, comprehensive set of tools that can meet the data analysis needs. The course is designed to familiarize students with the skills necessary to produce simple reports and data sets as well as providing an understanding of how SAS analyses and views data.

The students will also work on R which is a language and environment for statistical computing and graphics. provides a wide variety of statistical (linear and nonlinear modelling, classical statistical tests, time-series analysis, classification, clustering, ...) and graphical techniques, and is highly extensible

Course Contents:

Module I

Introduction to SAS

Module II: Manipulating Data

SAS syntax, variable naming rules, and entering your own data, Creating a SAS data set from raw data, Grouping Data values, Reading and combining SAS data sets. Relating information from multiple sources, Data translation tools, Manipulating and formatting date values

Module III: Programming Techniques

Plotting Data, Random Number Generators, If-Then-Else and Do Loops, Arrays, Retaining data across observations, Macro Programming

Module IV: Presenting Data

Writing simple reports, Descriptive statistics and summaries, Formatting tools, Charting data, Plotting data

Module V: R

Introduction and preliminaries of R, Simple manipulations; numbers and vectors, Objects, their modes and attributes, Ordered and unordered factors, Arrays and matrices, Lists and data frames, Reading data from files, Probability distributions, Grouping, loops and conditional execution, Writing your own functions, Statistical models in R, Graphical procedures, Packages

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Delwiche, Lora D. and Susan J. Slaughter (1998), The Little SAS Book, Second Edition, Cary, NC: SAS Institute, Inc. ISBN: 1-58025-239-7.

References:

- Cody, Ron (1999), Cody's Data Cleaning Techniques Using SAS Software, Cary, NC: SAS Institute, Inc. ISBN: 1-58025-600-7.
- Cody, Ronald P. and Jeffrey K. Smith (1997), Applied Statistics and the SAS Programming Language, Prentice Hall Engineering, Science and Math, ISBN: 0-13-743642-4.
- Gilmore, Jodie (1999), Painless Windows: A Handbook for SAS Users, Second Edition, Cary, NC: SAS Institute, Inc. ISBN: 1-58035-238-9.
- SAS Learning Edition

BIOPERL

Course Code: BTF 704

Credit Units: 02

Course Objective:

The objective of this course is to make students well versed with applications of Bioperl.

Course Contents:

Module I

Introduction to BioPerl, Basics of Packages, Modules and Widgets, Internet-related Libraries

Module II

Modules and Utilities, CPAN, Web Programming with Perl Script.

Module III

Application of Bioperl in Bioinformatics, Manipulation of BLAST output with BioPerl Programming.

Module IV

Creating User Interface with PERL/Tk, Perl Module Extension

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Mastering Perl for Bioinformatics, James D. Tisdall

References:

- Beginning Perl for Bioinformatics, James Tisdall

BIOJAVA

Course Code: BTF 705

Credit Units: 02

Course Objective:

The objective of this course is to make students well versed with concept and implementation of BIOJAVA.

Course Contents:

Module I

Introduction to BioJava, Installation and getting started

Module II: Basic Sequence Manipulation

Working with sequences SubSequence, Transcribe, Reverse, Change Name, Sequence Edit, Regex, Translation, Translation: Single, Translation: Six Frames, Proteomics, A Aindex

Sequence I/O

Reading and writing files, Creative file parsing with RichSeqIOListener

Write in Fasta, Read Fasta, Read GES, Gbto Fasta, ABI to Sequence, SeqIO: Echo

Annotation

Annotations and Comments, Annotations: List, Filter

Location & Feature

Locations: Point, Range, Circular, Feature, Filter, Locations: Remove

Module III: Blast & Fasta

Blast: Parser, Fasta: Parser, Blast: Extract, Blast: Echo

Module IV: Counts & Distribution

Count: Residues, Count: Frequency, To Distrib, Random Seqs, Entropy, Emissionf, Custom

BioJava: Cook Book: Distribution: XML, Distribution: Gibbs, Distribution: Bayes, Distribution: Composition

Weight Matrices and Dynamic Programming

DP: Weight Matrix, DP: HMM, DP: Pair Wise, DP: PairWise2

User Interface

ViewAsTree, ViewInGUI, Coordinates, Features, ProteinPeptideFeatures

Module V: Biosql and Database

BioSQL and Hibernate. , BioSQL Setup PostGre, BioSQL: Setup Oracle, BioSQL: Manage

Protein Structure

PDB: read, PDB: mutate

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- The Complete Reference JAVA 2: 5th. ed. By Schildt Herbert

References:

- Core Java: Advanced Features, Horstmann
- Java Servlet Programming Hunter J, Crauford
- Java Server Programming J2EE edition Allamaraju, et.al.

VB .NET (CONSOLE APPLICATION AND WINDOW FORMS)

Course Code: BTF 706

Credit Units: 02

Course Objective:

The objective of this course is to make students well versed with concept and implementation of .NET technology into different type of application.

Course Contents:

Module I

Introduction to Visual Basic .NET and .NET framework, Variables and Constants Programming Constructs, Implement Arrays, Object – oriented features of Visual Basic.NET , Option statement, Typecasting, procedures and functions, delegates, Implement classes in VB.NET, events handling,

Module II

Properties, Polymorphism, Inheritance, Implement Method Overriding, Interfaces, Multithreading, collection, Implement error handling

Module III

ADO .NET architecture, components of ADO.NET, Command and Connection Objects Transactions in ADO.NET, use of Dataset, Data Adapter and Data Reader object Use the Data Grid Control; List the properties and methods of the Data Grid Control Data Bind in Data Grid, Insert, Update and Delete data in Data Grid Control

Module IV

MDI and SDI applications, Menu Control, Dynamic Menu, Image List Control, Tool Bar and Status Bar Controls, Use the Timer Control, Tree View Control, List View Control

Module V

Crystal Reports (Type of crystal report, Crystal Report Viewer, Work with Crystal Report Expert), Bind Crystal Reports to Windows Forms applications, Help class and its Components, Packaging and Deploying concepts, Package Resources, various deployment alternatives

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Visual basic .net Black book by Dreamtech Steven Holzner

References:

- Programming Visual Basic.NET 2003, Jesse Liberty and Orelly
- Mastering VB .net, BPB Publications
- VB .net complete, BPB publication
- Visual Basic Step by Step, Microsoft

R AND BIOCONDUCTOR

Course Code: BTF 707

Credit Units: 02

Course Objective:

SAS software provides a complete, comprehensive set of tools that can meet the data analysis needs. The course is designed to familiarize students with the skills necessary to produce simple reports and data sets as well as providing an understanding of how SAS analyses and views data.

The students will also work on R which is a language and environment for statistical computing and graphics. provides a wide variety of statistical (linear and nonlinear modelling, classical statistical tests, time-series analysis, classification, clustering, ...) and graphical techniques, and is highly extensible

Course Contents:

Module I: R

Introduction and preliminaries of R, Simple manipulations; numbers and vectors, Objects, their modes and attributes, Ordered and unordered factors, Arrays and matrices, Lists and data frames, Reading data from files, Probability distributions, Grouping, loops and conditional execution, Writing your own functions, Statistical models in R, Graphical procedures, Packages.

Module II: BioConductor

Introduction to BioConductor, Intro to microarrays, installing and maintaining bioconductor, BioConductor Packages importation and QC, normalization, exprSets, filtering, data analysis options, annotation, GO/pathways/graphs.

Module III: Case Study

Limma, Case study on Microarray Classification, Incorporating biological metadata in genomic analyses, Statistical modeling of differential gene expression data Visualizing genomic data, Applying machine learning clustering and classifying methods to genomic data.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

Text:

- Delwiche, Lora D. and Susan J. Slaughter (1998), The Little SAS Book, Second Edition, Cary, NC: SAS Institute, Inc. ISBN: 1-58025-239-7.

References:

- Cody, Ron (1999), Cody's Data Cleaning Techniques Using SAS Software, Cary, NC: SAS Institute, Inc. ISBN: 1-58025-600-7.
- Cody, Ronald P. and Jeffrey K. Smith (1997), Applied Statistics and the SAS Programming Language, Prentice Hall Engineering, Science and Math, ISBN: 0-13-743642-4.
- Gilmore, Jodie (1999), Painless Windows: A Handbook for SAS Users, Second Edition, Cary, NC: SAS Institute, Inc. ISBN: 1-58035-238-9.
- SAS Learning Edition.

CLINICAL DATA MANAGEMENT LAB

Course Code: BTF 720

Credit Units: 01

Course Contents:

Module I

Database Management Systems (DBMS) for Clinical Research, Creating Tables and Relationships, CRF design, Creating Forms for Data Entry, Display and Filtering; Query and Report Basics, Exporting and Analyzing the Data, planning and budgeting for Data Management in a Clinical Research Study, Demonstrations of Database Management Systems for Clinical Research Studies, Oracle clinical, SAS, etc packages

Module II

Basic data analyses from clinical trials using the computer-based Stata software package.

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

DATA MINING LAB

Course Code: BTF 721

Credit Units: 01

Course Contents:

Module I

Using different data samples, practical experimentation with the various stages of data mining.

Use of Meta-Search Engines.

Using different data samples, practical experimentation with the various stages of data mining.

Module II

Use and result interpretation of Pratt, MEME, Miner, and Mast servers.

Demonstration of free data mining Software like WEKA, Yale, TANAGRA, DB2 Intelligent Miner

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

SAS (STATISTICAL ANALYSIS SYSTEM) AND R LAB

Course Code: BTF 722

Credit Units: 01

Course Contents:

Module I

Analysis using SAS

Module II

Analysis using R

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

BIOPERL LAB

Course Code: BTF 723

Credit Units: 02

Course Contents:

Module I

Format converter, Code reading, Sequence analysis,
Bio::SeqIO, Alignment modules, Application, Protal2dna, AlignIO

Module II

Running Blast, Blast Parsing, Blast:: Tools:: Bplite family parser, PSI-BLAST
Accessing a local database, database classes
GeneScan, Filehandle and stream

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

BIOJAVA LAB

Course Code: BTF 724

Credit Units: 02

Course Contents:

Module I

Basic sequence manipulation, Six Frame Translation, Transcription, AAIndex

Module II

Reading and Writing of Files, Parsing of different file format like FASTA, Swissprot, Genbank

Module III

Annotation and file filtering, Location and feature

Module IV

BLAST and FASTA programming. Dynamic Programming.

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

VB .NET LAB

Course Code: BTF 725

Credit Units: 02

Course Contents:

The coursework for the practical session will follow the theory syllabus and will be based on Window Applications using .NET

Module I

Implementation of function, procedures, delegates, classes in events handling in vb .net.

Module II

Implementation of Polymorphism, Inheritance, Method Overriding, Interfaces, Multithreading, collection, error handling in VB.Net

Module III

Database handling using ADO .NET, Insert Update, delete and retrieval of data using ADO .Net.

Module IV

Creation of MDI and SDI applications, Menu Control, Dynamic Menu, Image List Control, Tool Bar and Status Bar Controls, Use the Timer Control, Tree View Control, List View Control.

Module V

Creation of Crystal Reports (Type of crystal report , Crystal Report Viewer, Work with Crystal Report Expert), Bind Crystal Reports to Windows Forms applications, Help class and its Components, Packaging and Deploying concepts, Package Resources

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

R AND BIOCONDUCTOR LAB

Course Code:

BTF 726

Credit Units: 02

Course Contents:

Module I

Analysis using SAS

Module II

Analysis using R

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

COMMUNICATION SKILLS - V

Course Code: BTF 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:

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

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

BEHAVIOURAL SCIENCE - VII (INDIVIDUAL, SOCIETY AND NATION)

Course Code: BTF 743

Credit Units: 01

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

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
- Lindzey, G. and Borgatta, E: Sociometric Measurement in the Handbook of Social Psychology, Addison – Welsley, US.
- Rose, G.: Oxford Textbook of Public Health, Vol.4, 1985.
- Robbins O.B.Stephen; Organizational Behaviour

FRENCH - VII

Course Code: BTF 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
Exprimer 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
Exprimer 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & Références:

- le livre à suivre : Campus: Tome 2

GERMAN - VII

Course Code: BTF 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:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

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

SPANISH - VII

Course Code: BTF 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:

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

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 - VII

Course Code: BTF 747

Credit Units: 02

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:

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

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.

CHINESE – VII

Course Code: BTF 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 vice-versa.
Short fables.

Module V

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

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- “Kan tu shuo hua” Part-I Lesson 1-7

SUMMER PROJECT - II

Course Code: BTF 760

Credit Units: 06

GUIDELINES FOR SUMMER PROJECT

The main objective of Summer Project is to familiarize students to laboratory environment and make them learn to handle equipments and softwares, design experiments and analyze the results. The student will be supervised by one or more faculty members and he or she will be required to submit a synopsis. While writing a synopsis emphasis should be given to make it publishable. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student. Initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include

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

Report Layout

The report should contain the following components:

- TITLE PAGE
 - CERTIFICATE
 - ACKNOWLEDGEMENT
 - ABBREVIATIONS
 - CONTENTS WITH PAGE NUMBERS
 - CHAPTER –
 - a. INTRODUCTION
 - b. REVIEW OF LITERATURE
 - c. MATERIALS & METHODS
 - d. RESULTS & DISCUSSION
 - e. SUMMARY AND CONCLUSION
 - f. REFERENCES
 - g. APPENDIX (OPTIONAL)
-
- 1 inch Margin on left side & 1”each on other sides.
 - Single side of the paper to be used.
 - Times New Roman.
-
- ### **Font Size**
- 12 (Bold for headings)
 - 12 (Normal for Matter)
 - 14 (for Chapter Names)
 - 1.5 line spacing
 - Numbering on the right hand Top of the page
 - Numbers on pages before chapters to be done in Roman at the bottom of the page

References

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

Examples

For Research Article

Voravuthikunchai SP, Lortheeranuwat A, Ninprom T, Popaya W, Pongpaichit S, Supawita T. (2002) Antibacterial activity of Thai medicinal plants against enterohaemorrhagic *Escherichia coli* O157: H7. *Clin Microbiol Infect*, 8 (suppl 1): 116–117.

For Book

Kowalski,M.(1976) Transduction of effectiveness in *Rhizobium Meliloti*. SYMBIOTIC NITROGEN FIXATION PLANTS (editor P.S. Nutman IBP), 7: 63-67

- Scientific names in Italics
- Cover Page containing - Title, Students Name, Supervisors Name, University, Name (along with logo), Course name & year of Submission in the prescribed format
- 2 copies to be submitted

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution.. Evaluation will compose of two components - Project report assessment and Viva - voce. Project report assessment will be done by the two internal faculty members in respective fields. A committee of three faculty members will conduct Viva-voce.

Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project will be assessed as per evaluation format.

Examination Scheme:

Dissertation	50
Viva Voce	50
Total	100

PRINCIPLES OF MANAGEMENT AND ENTREPRENEURSHIP DEVELOPMENT

Course Code: BTF 801

Credit Units: 03

Course Contents:

Module I

Basic management skills – Planning, Organizing, Developing, Controlling

Module II

Performance Appraisal

Module III

Regulatory issues, Environmental issues

Module IV

Interpersonal skills and Wealth Creation Process

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

- Essentials of Management by H. Koontz, H. Weihrich and C. O'Donnell. McGraw-Hill/Irwin
- The Practice of Management by P. Drucker. Harper Business

PROJECT MANAGEMENT

Course Code: BTF 802

Credit Units: 03

Course Objective:

The emphasis is to on imparting skills on how to develop a project management plan, identify key milestones and develop delivery plans. Implementation and co-ordination of the project plan with an emphasise on communication and project promotion and monitoring. Major challenge of identifying barriers to implementation and creating deliverable solutions.

Course Contents:

Module I

Introduction – Conceiving a project, Strategic Management and Project Selection

Module II

Project Training – Conflict and Negotiation Developing a project, Appraisal of project – financial, marketing appraisal, technology appraisal and HRD appraisal, Managing the project, Termination/Replacement of project, Project in Contemporary Organizations.

Module III: Project Initiation

Project implementation – Scheduling, Resource Allocation, Monitoring and Information, Project Control

Module IV

Project Termination – Project Auditing and Termination

Module V

Full understanding of project and business management theory in the context of a clinical trial.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

- Project Management: A Managerial Approach by J.P. Meredith and S.J. Mantel. John Wiley and Sons Inc.

MOLECULAR MODELING AND DRUG DESIGNING

Course Code: BTF 803

Credit Units: 03

Course Objective:

Molecular modeling and computer graphics are powerful tools in the study of the relationships between molecular structure and biological activity, and thus essential in the process of rational drug design.. Different methods of drug designing will be discussed.

Course Contents:

Module I

Introduction to drug designing, drug design to discovery and development, drug metabolism, toxicity and pharmacokinetics, toxicology considerations, problems and drawbacks on drug discovery and development.

Module II

Drug Target classification, identification and validation strategies, Design and development of combinatorial libraries for new lead generation

Module III

Structure-based design – ‘de novo’ design methodologies 3D-database searching techniques, docking

Module IV

QSAR: Statistical techniques behind QSAR, classical QSAR, molecular descriptors 3D QSAR and COMFA

Module V

Basic principles of molecular modeling, molecular dynamics simulation techniques.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

- Principles of molecular modeling by Andrew Leach
- Principles of Drug Action by W.B. Pratt and P. Taylor. Churchill Livingstone
- Principles of Medicinal Chemistry by W.O. Foye, T.L. Lemke, and D.A. Williams. Williams and Wilkins
- Essentials of Drug Designing by V. Kothekar
- Drug Design by Cohen

IPR AND REGULATORY ISSUES

Course Code: BTF 803

Credit Units: 03

Course Objective:

It will familiarize the students of the IPR issues and regulatory issues pertaining to health care industries. The unit will also cover the regulatory legislation and associated approvals and permissions required to conduct high-quality single-centre, national and international clinical trials.. Ethical issues will be considered throughout the unit.

Course Contents:

Module I

Concept of Intellectual property, Overview of Intellectual Property Law and its origins, Copyrights and related rights, Trade Marks, Geographical Indications, Industrial Designs, Patents and standards for patentability, Protection of Undisclosed Information (Trade Secrets).

Module II

Rights of Publicity & Moral Rights, IPR at National level, International Protection of Intellectual property, Ethical conflicts with IPR.

Module III

Case studies involving Biotechnology/Bioinformatics cases (e.g., Human genome project, controversial patents like turmeric, neem and basmati rice etc.).

Module IV

Regulatory affairs, good clinical practice and ethics, GMP, cGMP.

Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

Text & References:

- Refer to articles and reports in journals on the regulatory issues.

COMMUNICATION SKILLS - VI

Course Code: BTF 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:

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

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

BEHAVIOURAL SCIENCE - VIII (PERSONAL AND PROFESSIONAL EXCELLENCE)

Course Code: BTF 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

FRENCH - VIII

Course Code: BTF 844

Credit Units: 02

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:

1. la construction passive
2. la forme impersonnelle
3. l'interrogation
4. les adjectifs et les pronoms indéfinis
5. les pronoms interrogatifs et démonstratifs
6. la construction avec deux pronoms
7. le subjonctif dans l'expression des sentiments, de la crainte, du but
8. constructions permettant l'expression de la cause et de la conséquence
9. l'enchaînement des idées : succession et opposition

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & Références:

- le livre à suivre : Campus: Tome 2

GERMAN - VIII

Course Code: BTF 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.

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

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

SPANISH – VIII

Course Code: BTF 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)

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

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

JAPANESE - VIII

Course Code: BTF 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:

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

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.

CHINESE – VIII

Course Code: BTF 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.

Examination Scheme:

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

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- “Kan tu shuo hua” Part-I Lesson 8-13

MOLECULAR MODELING AND DRUG DESIGNING LAB

Course Code: BTF 822

Credit Units: 01

Course Contents:

Module I

Building of Molecules

Module II

Structure based drug design

Module III

QSAR

Module IV

Energy minimisation and simulation techniques.

Examination Scheme:

IA			EE			
Class Test (Practical Based)	Mid Term Viva	Attendance	Major Experiment	Minor Experiment/Spotting	Practical Record	Viva
15	10	05	35	15	10	10

MAJOR PROJECT

Course Code: BTF 860

Credit Units: 16

GUIDELINES FOR PROJECT/DISSERTATION FILE

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation.

Research is genuine exploration of the unknown that leads to new knowledge which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

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

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include:

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

Report Layout

The report should contain the following components:

➤ **Title or Cover Page**

The title page should contain the following information: Project Title; Student's Name; Course; Year; Supervisor's Name.

➤ **Acknowledgements (optional)**

Acknowledgment to any advisory or financial assistance received in the course of work may be given.

➤ **Abstract**

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

➤ **Table of Contents**

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

➤ **Introduction**

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

➤ **Materials and Methods**

This section should aim at experimental designs, materials used. Methodology should be mentioned in details including modifications if any.

➤ **Results and Discussion**

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

Note that in writing the various sections, all figures and tables should as far as possible be next to the associated text, in the same orientation as the main text, numbered, and given appropriate titles or captions. All major equations should also be numbered and unless it is really necessary never write in “point” form.

➤ **Conclusion**

A conclusion should be the final section in which the outcome of the work is mentioned briefly.

➤ **Future prospects**

➤ **Appendices**

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

➤ **References / Bibliography**

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

Examples

For research article

Voravuthikunchai SP, Lortheeranuwat A, Ninrprom T, Popaya W, Pongpaichit S, Supawita T. (2002) Antibacterial activity of Thai medicinal plants against enterohaemorrhagic *Escherichia coli* O157: H7. *Clin Microbiol Infect*, **8** (suppl 1): 116–117.

For book

Kowalski, M.(1976) Transduction of effectiveness in *Rhizobium Meliloti*. SYMBIOTIC NITROGEN FIXATION PLANTS (editor P.S. Nutman IBP), **7**: 63-67

ASSESSMENT OF THE PROJECT /DISSERTATION FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution.

Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project.

Project execution is concerned with assessing how much work has been put in.

The File should fulfill the following **assessment objectives**:

Range of Research Methods used to obtain information

Execution of Research

Data Analysis

Analyse Quantitative/ Qualitative information

Control Quality

Draw Conclusions

Examination Scheme:

Dissertation	50
Viva Voce	50
Total	100