

Detailed Program
Bachelor of Technology (B.Tech.)
(Computer Science Engineering)

Semester-II
(2017-21)

DOC201712080019



RNB
GLOBAL UNIVERSITY
Educating stars for tomorrow

RNB GLOBAL UNIVERSITY
RNB Global City, Ganganagar Road,
Bikaner, Rajasthan 334601

OVERVIEW

RNB Global University follows Semester System. Accordingly, each academic year is divided into two semesters, **Odd (July-December)** and **Even (January-June)**. Besides this, the university follows a system of continuous evaluation along with regular updating in course curricula and teaching pedagogy.

The curriculum for B. Tech Program for (January- June) Even Semester, 2018 along with examination pattern is as follows:

Course Scheme

Semester -II

S. No.	Course Code	Course Name	Credits
1.	19001800	Applied Mathematics-II	4
2.	19001900	Applied Physics-II	3
3.	19002000	Applied Physics Lab-II	1
4.	19002100	Engineering Graphics	3
5.	19002500	Engineering Graphics lab	1
6.	19000400	Applied Chemistry	4
7.	19000500	Applied Chemistry Lab	2
8.	19002400	Basic Mechanical Engineering	3
9.	99001900	Environmental Studies	4
10.	19001100	Ability & Skill Enhancement Module II	3
11.	99002000	NCC/NSS/ Other Similar Activities	-
12.	99002100	Club Activities	-
13.	99001700	Seminar	-
Total Credits			28

EVALUATION SCHEME- THEORY

The evaluation of the theory paper of B.Tech would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessments as follows:

Internal Assessment

Area of Assessment	Marking	Maximum Marks
Sessional-I	As per marks obtained	10
Sessional-II	As per marks obtained	10
Assignment + Presentation	15	15
Overall Conduct and Discipline	To be decided by concerned Faculty Member	5
Attendance	Student with 80% attendance will get 5 marks and 0.25marks for every 1% attendance above 80%	10
Total	50	

External Assessment

Type	Marks
Theory	50

EVALUATION SCHEME -PRACTICAL

The evaluation of the practical paper of B.Tech would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessment is as follows:

Internal Assessment

Type	Details	Marks
Marks obtained in various manuals, practical file, participation, any model prepared, output of practical	Average of marks obtained	35
Discipline	To be decided by concerned faculty	5
Attendance	80% - 5 marks and 0.25 percent for every one percent above 80 %	10

TOTAL	50
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External Assessment

Type	Marks
Practical	50

EVALUATION SCHEME- NSS/NCC AND CLUB ACTIVITIES

1. NSS/NCC /Similar activities prescribed by University will be completed from Semester I – Semester VI. It will be evaluated internally by the respective institute. The credit for this will be given after VIth Semester.
2. The students have to join club/clubs with the active participation in different activities of club. The students would be continuously assessed from Semester I – Semester VI and credits and marks would be given after VIth Semester.

CURRICULUM

Course Name: Applied Chemistry

Course Code: 19000400

Course Outline:

Unit I Lubrication and Lubricants Functions of lubricant, Mechanism of lubrication: Thick film, thin film and extreme pressure lubrication, classification of lubricants, Properties of lubricants (flash point, fire point, viscosity index(Numericals), Cloud and pour point, saponification value(Numericals), acid value(Numericals), iodine value(Numericals), consistency, drop point). Synthetic lubricant and Additives for lubricants.

Unit II: The Phase Rule Phase Equilibrium: Definition of various terms: Phases, components and degrees of freedom of a system, criteria of phase equilibrium. Gibbs Phase Rule and its thermodynamic derivation. Derivation of Clausius – Clapeyron equation and its importance in phase equilibria. Phase diagrams of one-component systems (water and sulphur) and two component systems involving eutectics (Lead-Silver system its application in Pattinson's process), System having congruent melting points (Zinc-magnesium system) and System having incongruent melting points (Na-K system). Applications of phase rule: Freeze drying, safety plugs, solders and freezing mixtures.

Unit III: Water Introduction and specifications of water , Hardness and its determination by EDTA method (Numericals), Alkalinity and its determination (Numericals), Boiler feed water, boiler problems– scale, sludge, priming & foaming: causes & prevention, Boiler problems– caustic embrittlement& boiler corrosion: causes & prevention, Desalination by Reverse Osmosis and Electrodialysis, Disinfection by break-point chlorination. Water Softening by Internal Treatment: carbonate & phosphate conditioning, colloidal conditioning & calgon treatment Water Softening by External Treatment: Lime-Soda Process (Numericals) Zeolite & Ion-Exchange Process.

Unit IV: Corrosion & Its Control Causes, effects & consequences; Chemical or Dry corrosion & its mechanism (Pilling-Bedworth Rule) Electrochemical or Wet Corrosion & Its mechanism, Rusting of Iron Passivity, Galvanic series, Galvanic Corrosion, Soil Corrosion Pitting Corrosion, Concentration Cell or Differential Aeration Corrosion, Stress Corrosion. Factors Influencing Corrosion: Nature of metal and nature of corroding environment; Protective measures: Galvanization, Tinning Cathodic Protection, Sacrificial Anodic protection, Prevention of Corrosion by Material selection & Design.

Unit V: Polymers and Polymerisation Organic polymers and its classification, Mechanism of polymerization: free radical, cationic, anionic and coordination polymerization, effect of structure on properties of polymers, preparation, properties and technical applications of thermo-plastic (PVC, PVA), thermosets (PF, UF), and elastomers (SBR, GR-N), Inorganic polymer: silicones, introduction to polymeric composites.

Suggested Readings:

1. Engineering Chemistry: by P. C. Jain & Monika Jain
2. A Text Book of Engineering Chemistry: by ShashiChawla
3. J. C. Kuriakose and J. Rajaram, “Chemistry in Engineering and Technology”, Tata Mcraw-Hill Publications Co. Ltd., New Delhi
4. V.R. Gowrikar, N.V. Viswanathan and JaydevSreedhar, “Polymer Science”, New Age International Pvt. Ltd., New Delhi

Course Name: Applied Chemistry Lab

Course Code: 19000500

Course Outline

1. List of Experiments
2. Determination of the total hardness of the water by EDTA method.
3. Determine of temporary and permanent hardness of water by EDTA method.

4. Determine of Calcium and Magnesium hardness of water using EDTA solution.
5. Determination of alkalinity of water sample.
6. Determination of Dissolve Oxygen (D.O.) in the given water sample.
7. To find the Melting and Eutectic point for a two component system by cooling curve method.
8. Determination of viscosity of lubricant by Redwood Viscometer (No.1 & No.2).
9. Determination of flash point and fire point of oil by Pensky-Marten's flash point apparatus.
10. To find out Saponification Number of an Oil.
11. Determination of acid value of an oil
12. Determination of iodine value of an oil
13. Estimation of total iron in a iron alloy.
14. Preparation of copper pigment. And Preparation of Phenol-Formaldehyde resin.
15. Preparation of Aspirin

Suggested Readings

1. Practical Engineering Chemistry by K. Mukkanti, et.al, B.S. Publications, Hyderabad.
2. Inorganic quantitative analysis, Vogel.
3. Text Book of engineering chemistry by R. N. Goyal and HarrmendraGoel, Ane Books Private Ltd.,
4. A text book on experiments and calculation Engg. S.S. Dara.
5. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications

Course Name: Applied Mathematics- II

Course Code: 19001800

Course Outline:

Unit I Ordinary Differential Equations and Applications Exact differential equations, equations reducible to exact differential equations. Applications of differential equations of first order & first degree to simple electric circuits, Newton's law of cooling, heat flow and orthogonal trajectories, linear differential equations of second and higher order. Complete solution, complementary function and particular integral, method of variation of parameters to find particular integral, Cauchy's and Legendre's linear equations, simultaneous linear equations with constant coefficients. Applications of linear differential equations to simple pendulum, oscillatory electric circuits.

Unit II Laplace Transform: Definition, existence theorem (statement only), Laplace transform

of derivatives, integrals and periodic functions. Unit step (Heaviside) & impulse (Dirac – Delta) functions. Inverse Laplace Transform. Convolution – theorem. Applications to solution of simple linear and simultaneous differential equations with constant coefficients and application to integral equations.

Unit III Partial Differential Equations & its applications: Formation of partial differential equations, Lagrange’s linear partial differential equation, first order non-linear partial differential equation, Charpit’s method. Method of separation of variables and its applications to wave equation, one dimensional heat equation and two-dimensional heat flow (steady state solutions only).

Unit IV Matrices & its Applications: Rank of a matrix, elementary transformations, elementary matrices, inverse using elementary transformations, normal form of a matrix, linear dependence and independence of vectors, consistency of linear system of equations, linear and orthogonal transformations, eigenvalues and eigenvectors, properties of eigenvalues, Cayley - Hamilton theorem and its applications, diagonalization of matrices, similar matrices, quadratic forms.

Suggested Readings:

1. E. kresyzig, "Advance Engineering Mathematics", Wiley publications
2. Michael Greenberg, "Advance Engineering mathematics", Pearson.
3. R.K. Jain and S.R.K. Iyengar, "Advanced Engineering Mathematics "Narosa Publications
4. B. S. Grewal, "Higher Engineering Mathematics" Khanna Publications.
5. S. Ponnusamy, "Foundation of Complex Analysis" Narosa Publication
6. G.B. Thomas and R. N. Finny " Calculus and Analytic Geometry" Addison Wesley/ Narosa
7. Wylie R, " Advance Engineering mathematics" , McGraw-Hill
8. M. Spiegel, "Schaum’s Outline on Laplace Transform, Tata McGraw-Hill

Course Name: Applied Physics-II

Course Code: 19001900

Course Outline:

Unit I Fiber Optics and Holography : Spatial and temporal coherence, Coherence length, Coherence time and ‘Q’ factor for light Fundamental ideas about optical fiber, Propagation mechanism, Acceptance angle and cone, Numerical aperture, Single and Multi Mode Fibers, Dispersion and Attenuation. Holography: Basic Principle of Holography, Construction and

reconstruction of Image on hologram and applications of holography

Unit II Elements of Material Science : Bonding in Solids: Covalent bonding and Metallic bonding. Classification of Solids as Insulators, Semiconductors and Conductors. Semiconductors: Conductivity in Semiconductors, Determination of Energy gap of Semiconductor. X-Ray diffraction and Bragg's Law. Hall Effect: Theory, Hall Coefficient and applications.

Unit III Superconductors: Temperature dependence of resistivity in superconducting materials, Effect of magnetic field (Meissner effect), Temperature dependence of critical field, London equations, Josephson theory, persistent currents, Type I and Type II superconductors, BCS theory (Qualitative), High temperature superconductors and Applications of Superconductors.

Unit IV Atomic & Nuclear Physics: Bohr's atomic model and energy level diagram, Sommerfeld relativistic atomic model, general properties of nucleus, Mass defect and packing fraction, nuclear binding energy, Semi-empirical mass formula.

Unit V Nuclear Radiation Detectors: Characteristics of gas filled detectors: general considerations, Constructions, Working and properties of: Ionization chamber, proportional counter, G. M. Counter and Scintillation Counter.

Suggested Readings:

1. Arthur Beiser 'Concepts of Modern Physics', [McGraw-Hill], 6th Edition 2009.
2. S.Vasudeva, 'Modern Engineering Physics', S. Chand, 6th Edition, 2013.
3. Richard Wolfson 'Essential University Physics' Pearson, 1st edition, 2009.
4. H.K. Malik & A. K. Singh 'Engineering Physics' [McGraw-Hill], 1st Edition, 2009.
5. C. Kittle, 'Mechanics', Berkeley Physics Course, Vol.- I. Latest Edition.
6. Irving Kaplan 'Nuclear Physics' Latest Edition.
7. John R. Taylor, Chris D. Zafirator and Michael A. Dubson, 'Modern Physics For Scientists and Engineers', PHI, 2nd Edition.
8. D.J. Griffith, 'Introduction to Electrodynamics', Prentice Hall, Latest Edition.

Course Name: Applied Physics-II Lab

Course Code: 19002000

Course Outline

List of Experiments

1. To determine the wavelength of monochromatic light by Newton's ring.
2. To find the wavelength of various colours of white light with the help of a plane transmission diffraction grating.
3. To determine the specific resistance of a given wire using Carey Foster's bridge.
4. To find the wavelength of sodium light by Michelson interferometer.
5. To find the resolving power of a telescope.
6. To convert a Galvanometer in to an ammeter of given range and calibrate it.
7. To convert a Galvanometer in to a voltmeter of given range and calibrate it.
8. To determine the dispersive power of material of a Prism for Violet Red and yellow colours of Mercury light with the help of a spectrometer.
9. To study the Charge & Discharge of a condenser and hence determine time constant (Both current and voltage graphs are to be plotted).
10. To find the value of Planck's constant by using a solar cell / photo electric cell.

Course Name: Engineering Graphics

Course Code: 19002100

Course Outline

Unit I Fundamentals Drawing standard - BIS, dimensioning, lettering, type of lines, scaling-conventions. Geometrical constructions Dividing a given straight line into any number of equal parts, bisecting a given angle, drawing a regular polygon given one side, special methods of constructing a pentagon and hexagon – conic sections – ellipse – parabola – hyperbola - cycloid – trochoid.

Unit II Orthographic projection Introduction to orthographic projection, drawing orthographic views of objects from their isometric views - Orthographic projections of points lying in four quadrants, Orthographic projection of lines parallel and inclined to one or both planes Orthographic projection of planes inclined to one or both planes.

Unit III Projections of simple solids - axis perpendicular to HP, axis perpendicular to VP and axis inclined to one or both planes. Sectioning of solids Section planes perpendicular to one plane and parallel or inclined to other plane.

Unit IV Intersection of surfaces Intersection of cylinder & cylinder, intersection of cylinder & cone, and intersection of prisms. Development of surfaces Development of prisms, pyramids and cylindrical & conical surfaces. Isometric and perspective projection Isometric projection

and isometric views of different planes and simple solids, introduction to perspective projection. Computer aided drafting Introduction to computer aided drafting package to make 2-D drawings.

Course Name: Engineering Graphics lab

Course Code: 19002500

Course Outline

List of Practical's

1. One Sheet on Lettering, Types of Lines, Symbols used
2. One Sheet on Conic Sections like- Ellipse, Parabola , Hyperbola and Cycloid.
3. Two Sheet on Simple Scale, Diagonal Scale and Scale of Chord.
4. One Sheet on Orthographic Projections of Points.
5. One Sheets on Orthographic Projections of Lines.
6. One Sheet on Orthographic Projections of Planes.
7. Two Sheets on Projections of Simple Solids.
8. One Sheet on Sectioning of Solids.
9. One Sheet on Intersection of Surfaces.
10. One Sheet on development of Surfaces.

Course Name Basic Mechanical Engineering

Course Code: 19002400

Course Outline

Unit I : Engineering Materials :Materials and Civilization, their socio economic impact. Classification of engineering material, composition of cast iron and carbon steels , wrought iron and their mechanical properties, stress-strain diagram, Alloy steels: stainless steel, tool steel. Alloys of Non Ferrous Metals: Common uses of various non-ferrous metals (Copper, Zinc, Tin, Magnesium, Lead, Aluminum etc.) & alloys and its composition such as Cu-alloys: Brass, Bronze, Al-alloys.

Unit II: Fluids :Fluid and continuum, Physical properties of fluids, Rheology of fluids, Types of fluid flows: Continuum & free molecular flows. Steady and unsteady, uniform and non-uniform, laminar and turbulent flows, rotational and irrotational flows, compressible and incompressible flows, subsonic, sonic and supersonic flows, sub-critical, critical and

supercritical flows, one, two and three dimensional flows, streamlines, continuity equation, Bernauli's equation for incompressible fluids. working principle of fluid coupling, pumps, compressors, turbines.

Unit III for Simple Stress, Bending & Torsion: Normal and shear stresses. One Dimensional Loading, members of varying cross section, bars in series, Elastic constants, Modulus of Elasticity, Strain energy.

Bending (Flexural) Stresses: theory of pure bending, neutral surface and neutral axis, Bending Equation, stresses in beams of different cross sections.

Torsion: Torsion Equation, combined bending & torsion of solid & hollow shafts.

Unit IV: Friction & IC Engine Static and Kinetic friction, laws of dry friction, co-efficient of friction, angle of friction, angle of repose, cone of friction, Belt drive- derivation of equation

Internal Combustion Engines: Classification of I.C. Engines and their parts, working principle and comparison between 2 Stroke and 4 stroke engine , difference between SI and CI engines. Pv and T-s diagrams of Otto and Diesel cycles.

Practical Learning-

1. To Study the working of 2 Stroke diesel/ petrol Engine.
2. To Study the Working of 4 Stroke diesel/ Petrol Engine.
3. To Study the working of Fluid Couplings.
4. To Study the working of Pumps.
5. To Study the working of Turbines

Suggested Readings:

1. Engg Mechanics by A.K.Tayal (Umesh Publications).
2. Engg Mechanics by Basudeb Bhattacharya (Oxford university Press)
3. Engg Mechanics by Irving H. Shames (Pearson publications).
4. Engg Mechanics by U.C.Jindal (Galgotia Publications).
5. Engg Mechanics by Beer & Johnston (TMH).
6. Engg Mechanics by K.L.Kumar (TMH).
7. Engg Mechanics by Sadhu Singh (Khanna Publishers).

Course Name: Environmental Studies

Course Code: 99001900

Course Outline:

Unit I: The Multidisciplinary Nature of Environmental Studies Definition, scope and

importance need for public awareness. Natural Resources Renewable and Non-renewable Resources: Natural resources and associated problems. (a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people. (b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. (c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. (d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, Case studies. (e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies. (f) 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.

Unit II: 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, oceans, estuaries).

Unit III: 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.

Unit IV 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 hazards. 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.

Unit V: Social Issues and the Environment. From unsustainable to sustainable development. Urban problems 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. Waste land reclamation. Consumerism and waste products.Environment 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.

Unit VI: Human Population and the Environment. Population growth, variation among nations. Population explosion—Family Welfare Programme. 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.

Field Work. Visit to a local area to document environmental assets - river/forest/grassland/hill/mountain. Visit to a local polluted sites - Urban/Rural/Industrial/Agricultural. Study of common plants, insects, birds. Study of simple ecosystems—pond, river, hill slopes, etc .

Suggested Readings

1. Environmental Geography, H.M. Saxena, Rawat Pub.
2. A Textbook Of Environment, K.M. Agrawal; P.K. Sikdar; S.C. Deb, McMillanPub.
3. A Textbook of Environmental Studies, D K Asthana&MeeraAsthana, S. Chand Pub.
4. Environmental Studies, V. K. Ahluwalia, The Energy and Resources Institute, Pub, (2012).
5. Environmental Chemistry, A.K. Dey, New Age Pub.
6. Environmental Biology, K.C. Agarwal, Nidi Pub. Ltd. Bikaner

Course Name: Ability and Skill Enhancement Module- II

Course Code : 19001100

Course Outline - Final Assessment – Debate/Group Discussion

Unit I- Phonetics Phonetic symbols and the International Phonetic Alphabets (IPA), The Description and Classification of Vowels (Monophthongs & Diphthong) Consonants, Phonetic Transcription & Phonology, Syllable, Stress & Intonations, Reading aloud, recording audio clips.

Unit II – Vocabulary Building Idioms and Phrases, Words Often Confused, One word Substitution, Word Formation: Prefix & Suffix.

Unit - III Ethics & Etiquettes What are ethics, what are values, difference between ethics and morals, Business ethics, workplace ethics, what are virtues for e.g. civic virtues, etc. Human ethics and values- 5 core human values are: right conduct, living in peace, speaking the truth, loving and care, and helping others.

Etiquette awareness, Importance of First Impression, Personal Appearance & Professional presence, Personal Branding, Dressing Etiquette, Dining Etiquette.

Unit IV - Reading & Writing Skills Reading Comprehension, News Reading, Picture Description, Paragraph Writing, News Writing.

Unit V - Listening & Speaking Skills Public Speaking, Debate, Inspirational Movie Screening, Skit Performance.

Note : The review of syllabus happens of periodic basis for the benefit of students and in case there are changed in curriculum due to review, students would be intimated in writing

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