JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

Course structure for B.Tech. (Regular) I year (2009-10) for affiliated Engineering Colleges.


<table>
<thead>
<tr>
<th>S.No</th>
<th>Subject</th>
<th>Theory</th>
<th>Tutorial</th>
<th>Drg.</th>
<th>Lab.</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>English</td>
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<td>2.</td>
<td>Engineering Physics</td>
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<td>3.</td>
<td>Engineering Chemistry</td>
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<td>4.</td>
<td>Mathematics – I</td>
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<tr>
<td>5.</td>
<td>Programming in C and Data Structures</td>
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<td>6.</td>
<td>Mathematical Methods</td>
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<td>7.</td>
<td>Engineering Drawing</td>
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<td>8.</td>
<td>C Programming &amp; Data Structures Lab</td>
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<td>9.</td>
<td>Engineering &amp; I.T. Workshop</td>
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<td>10.</td>
<td>Engineering Physics and Engineering Chemistry Lab</td>
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<tr>
<td>11.</td>
<td>English Language &amp; Communication Skills Lab</td>
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</tbody>
</table>

**contact periods/week** 15 3 6 12 52

Total contact periods/week 36

For Branches: M.E., C.E, Bio-Tech.***, Aero.E.

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**contact periods/week** 15 3 6 12 52

Total contact periods/week 36

* Engineering Drawing will have University external Exam.
** The Students attend the Physics lab and Chemistry lab in alternate week that is 3/2 per week.
*** Students with MPC stream admitted to Bio-Tech. will have to take “Essentials of Biotechnology” as Audit Course with no end exam or credits
1. **INTRODUCTION:**

The sweeping changes in the world have elevated English to the status of a tool of global communication and transformed it into e-English. The syllabus has been drafted to improve the competence of students in communication in general and language skills in particular. The books prescribed serve as students’ handbooks.

The teacher should focus on the skills of reading, writing, listening and speaking while using the prescribed text and exercises. The classes should be interactive. The students should be encouraged to participate in the classroom proceedings and also to write short paragraphs and essays. The main aim is to encourage two way communications in place of the one-sided lecture.

The text for non-detailed study is meant for extensive reading by the students. They may be encouraged to read some select topics on their own, which could lead into a classroom discussion. In addition to the exercises from the texts done in the class, the teacher can bring variety by using authentic materials such as newspaper articles, advertisements etc.

2. **OBJECTIVES:**

a. To improve the language proficiency of the students in English with an emphasis on LSRW skills.

b. To equip the students to study academic subjects with greater facility through theoretical and practical components of the syllabus.

c. To develop study skills as well as communication skills in formal and informal situations.

3. **SYLLABUS :**

**Listening Skills:**

Objectives

1. To enable students to develop their listening skills so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation.

2. To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and dialects.

*Students should be given practice in listening and identifying the sounds of English language and to mark stress, right intonation in connected speech.*

- Listening for general content
- Intensive listening
- Listening to fill up information
- Listening for specific information

**Speaking Skills :**

Objectives

1. To make students aware of the role of ability to speak fluent English and its contribution to their success.

2. To enable students to express themselves fluently and appropriately in social and professional contexts.

- Oral practice
- Role play – Individual/Group activities
- Describing objects/situations/people
- Just A Minute (JAM) Sessions.

(Using exercises from all units of the prescribed text)
**Reading Skills:**
Objectives
1. To develop an awareness in the students about the significance of silent reading and comprehension.
2. To develop the ability to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.

- Skimming the text
- Identifying the topic sentence
- Understanding discourse features
- Understanding the gist of an argument
- Inferring lexical and contextual meaning
- Recognizing coherence/sequencing of sentences

*The students shall be trained in reading skills using the prescribed text for detailed study. They shall be examined in reading and answering questions using ‘unseen’ passages which may be taken from the non-detailed text or other authentic texts, such as magazines/newspaper articles.*

**Writing Skills:**
Objectives
1. To develop an awareness in the students the skill to write exact and formal writing
2. To equip them with the components of different forms of writing.

- Writing sentences
- Paragraph writing
- Narration / description
- Formal and informal letter writing
- Use of appropriate vocabulary
- Coherence and cohesiveness
- Note Making
- Editing a passage

**4. TEXTBOOKS PRESCRIBED:**
In order to improve the proficiency of the student in the acquisition of the four skills mentioned above, the following texts and course content, divided into **Eight Units**, are prescribed:

*For Detailed study:* ENJOYING EVERYDAY ENGLISH, Sangam Books (India) Pvt Ltd
Hyderabad, 2009

*For Non-detailed study:* INSPIRING LIVES, Maruti Publications, Guntur, 2009

**Unit -I**
- a. Heaven’s Gate from ENJOYING EVERYDAY ENGLISH
- b. Mokshagundam Visvesaraya from INSPIRING LIVES

**Unit -II**
- a. Sir C.V.Raman from ENJOYING EVERYDAY ENGLISH
- b. Mother Teresa from INSPIRING LIVES

**Unit -III**
- a. The Connoisseur from ENJOYING EVERYDAY ENGLISH
- b. Dr. Amartya Kumar Sen from INSPIRING LIVES
Unit - IV
   a. The Cuddalore Experience from **ENJOYING EVERYDAY ENGLISH**
   b. Gertrude Elion from **INSPIRING LIVES**

Unit - V
   a. Bubbling Well Road from **ENJOYING EVERYDAY ENGLISH**
   b. Vishwanathan Anand from **INSPIRING LIVES**

Unit - VI
   a. Odds Against Us from **ENJOYING EVERYDAY ENGLISH**
   b. Charlie Chaplin from **INSPIRING LIVES**

Unit – VII
   Exercises on Reading and Writing Skills, Reading Comprehension, Letter writing, Report writing

Unit – VIII
   Exercises on Remedial Grammar covering Common errors in English, Subject-Verb agreement, Use of Articles and Prepositions, Active/Passive Voice, Reported speech, Tenses

   Vocabulary development covering Synonyms & Antonyms, one-word substitutes, prefixes & suffixes, Idioms & phrases, words often confused.

**Evaluation:** The question paper shall contain two parts, Part A containing questions from Units I–VI and Part B containing questions from units VII & VIII. The student is required to answer five full questions choosing at least one from Part B.

**REFERENCES:**
1. Technical Communication, Principle and Practice, Meenakshi Raman and Sangita Sharma, OUP, 2009
3. Resumes and Interviews, M.Ashraf Rizvi, Tata – Mcgraw Hill, 2009
ENGINEERING PHYSICS

UNIT I


UNIT II


UNIT III

PRINCIPLES OF QUANTUM MECHANICS & ELECTRON THEORY: Waves and Particles - de-Broglie’s hypothesis - Heisenberg’s uncertainty principle - Schrödinger’s one dimensional wave equation (Time Independent) - Particle in a one dimensional potential box - Energy levels - Fermi-Dirac distribution and effect of Temperature (qualitative treatment only) - Scattering - Source of electrical resistance - Kronig-Penney model (qualitative treatment only) - energy bands – metals, semi conductors & insulators.

UNIT IV


UNIT V


DIELECTRIC PROPERTIES: Introduction - Dielectric constant - Electronic, Ionic and Orientation polarizations (qualitative treatment only) - Local field - Clausius-Mossotti equation – Frequency dependence of polarisability (qualitative treatment only) – Ferro electricity- BaTiO₃.
UNIT VI

SUPERCONDUCTIVITY: General properties - Meissner effect - Penetration depth - Type I and Type II superconductors - Flux quantization – Josephson effects – BCS theory - Applications of superconductors.


UNIT VII


UNIT VIII


TEXT BOOKS:

2. Engineering Physics by M.R.Srinivasan New Age Publications

REFERENCES:

1. Physics Volume 2, by Halliday, Resnick and Krane; John Wiley India
2. Solid State Physics by C.Kittel, Wiley India
3. Engineering Physics by Mittal, I.K.International
I Year B.Tech. (common to all branches)  

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ENGINEERING CHEMISTRY

UNIT I:


UNIT II:

UNIT III:
Conducting Polymers, Synthesis and applications of Polyacetylene and Poly aniline
Liquid Crystals definition, properties, suitable examples and Engineering Applications

UNIT IV:
Chemistry of nano materials: Nano materials definition, properties and applications;
Explosives and Propellants: Explosives, Classification, precautions during storage, blasting fuses, important explosives.
Rocket propellants, classification of propellants.
Lubricants :Principles and function of lubricants - Classification and properties of lubricants – Viscosity, flash and fire points, cloud and pour points, aniline point, Neutralisation Number and Mechanical Strength.

UNIT V:
Electrochemical Cells: Measurement of EMF, Standard electrode potential, concentration cells, batteries (Ni–Cd cell), Lithium batteries. Fuel cell: hydrogen oxygen fuel cell and methanol fuel cell
Insulators – Definition, Properties and Characteristics of Insulating Materials; Engineering Applications.
UNIT VI:
**Phase rule:** Definition, Terms involved in Phase Rule and Phase rule equation. Phase diagrams – one component system (water system), two component system (lead- silver system) Eutectics, heat treatment based on iron-carbon phase diagram, hardening, annealing.

UNIT VII:

VIII:
**Building Materials:**
**Refractories:** Definition, Classification With Examples; Criteria of a Good Refractory Material; Causes for the failure of a Refractory Material

TEXT BOOKS:
1. Chemistry for Engineers Prof. K.N. Jayaveera, Dr. G.V. Subba Reddy and Dr. C. Ramachandraiah, McGraw Hill Higher Education Hyd., 2009

REFERENCE:
2. Fuel Cells principles and applications by B. Viswanath, M. Aulice Scibioh-Universities press
4. Physical Chemistry - Glasston & Lewis.
UNIT – I
Differential equations of first order and first degree – Exact, linear and Bernoulli equations. Applications to Newton’s law of cooling, law of natural growth and decay, orthogonal trajectories.

UNIT – II
Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type $e^{ax}$, Sin ax, cos ax, polynomials in x, $e^{ax} V(x)$, $xV(x)$, method of variation of parameters.

UNIT – III
Rolle’s Theorem – Lagrange’s Mean Value Theorem – (excluding proof). Simple examples of Taylor’s and Maclaurin’s Series - Functions of several variables – Jacobian – Maxima and Minima of functions of two variables, Lagrangian method of Multipliers with three variables only.

UNIT – IV
Radius of Curvature – Curve tracing – Cartesian, polar and parametric curves. Applications of integration to lengths, volume and surface area of solids of revolution in Cartesian and polar coordinates

UNIT – V
Multiple integral: – Double and triple integrals – Change of Variables – Change of order of integration.

UNIT – VI

UNIT – VII
Differentiation and integration of Laplace transform – Application of Laplace transforms to ordinary differential equations of first and second order.

UNIT – VIII
Vector Calculus: Gradient – Divergence – Curl and Their properties; Vector integration – Line integral - Potential function – Area, Surface and volume integrals. Vector integral theorems: Green’s theorem – Stoke’s and Gauss’s Divergence Theorem (excluding their proof). Verification of Green’s – Stoke’s and Gauss’s Theorems.
TEXT BOOKS:

REFERENCES:
ENGINEERING DRAWING

UNIT – I
Curves used in Engineering Practice:
a) Conic Sections including the Rectangular Hyperbola – General method only.
b) Cycloid, Epicycloids and Hypocycloid
c) Involute.
d) Helices

UNIT – II
PROJECTION OF POINTS AND LINES: Principles of Orthographic Projection – Conventions – First and Third Angle Projections. Projections of Points, Lines inclined to one or both planes, Problems on projections, Finding True lengths & traces only.

UNIT – III
PROJECTIONS OF PLANES: Projections of regular Plane surfaces, Projection of lines and planes using auxiliary planes.

UNIT – IV
PROJECTIONS OF SOLIDS
Projections of Regular Solids inclined to one or both planes – Auxiliary Views.

UNIT – V
SECTIONS & DEVELOPMENTS OF SOLIDS
Section Planes and Sectional views of Right Regular Solids– Prism, Cylinder, Pyramid and Cone – True shapes of sections.
Development of Surfaces of Right Regular Solids – Prisms, Cylinder, Pyramid, Cone and their Sectional parts.

UNIT – VI
Conversion of Isometric Views to Orthographic Views – Conventions.

UNIT – VII
INTERPENETRATION OF RIGHT REGULAR SOLIDS:
Intersection of Cylinder Vs Cylinder, Cylinder Vs Prism, Cylinder Vs Cone, Square Prism Vs Square Prism.

UNIT – VIII
PERSPECTIVE PROJECTIONS: Perspective View: Plane Figures and Simple Solids, Vanishing Point Methods (General Method only).

TEXT BOOKS:
1. Engineering Drawing, N.D. Bhat / Charotar
2. Engineering Drawing, Johle / Tata McGraw-Hill
3. Engineering Drawing, Shah and Rana, 2/e Pearson education

REFERENCES:
1. Engineering Drawing and Graphics, Venugopal/ New age
2. Engineering Drawing, B.V.R. Gupta, J.K. Publishers
Any TEN of the following experiments are to be performed during the Academic year.

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Name of the Experiment</th>
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<tbody>
<tr>
<td>2.</td>
<td>Dispersive power of the prism – Spectrometer.</td>
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<td>4.</td>
<td>Determination of particle size by using a laser source.</td>
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<td>5.</td>
<td>Determination of thickness of a thin wire using parallel fringes.</td>
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<td>7.</td>
<td>Magnetic field along the axis of a current carrying coil – Stewart and Gee’s method.</td>
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<td>9.</td>
<td>Hall effect.</td>
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<td>11.</td>
<td>Energy gap of a material of p-n junction</td>
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<td>12.</td>
<td>Determination of rigidity modulus of a wire material – Torsional pendulum</td>
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<tr>
<td>13.</td>
<td>Determination of dielectric constant.</td>
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<tr>
<td>15.</td>
<td>Melde’s experiment – Transverse &amp; Longitudinal modes.</td>
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</tbody>
</table>

Equipment required:
Spectrometer, Grating, Prism, Mercury vapour lamp, Sodium vapour lamp,
Travelling Microscope, Wedge arrangement, Newton rings setup, Stewart-Gee’s apparatus, He-Ne laser source, Optical fiber, Hall effect kit, B-H loop kit,
Energy gap kit (four probe method), Torsional pendulum, Dielectric constant kit,
Sonometer, Melde’s apparatus
ENGINEERING CHEMISTRY LAB

2. Preparation of Standard Potassium Dichromate and Estimation of Copper, by Iodometry.
4. Preparation of Standard EDTA and Estimation of Copper
5. Determination of Manganese in Steel and Iron in Cement.
6. Determination of strength of the given Hydrochloric acid against standard sodium hydroxide solution by Conductometric titration
7. Determination of viscosity of the oils through Redwood viscometer
8. Determination of calorific value of fuel using Bomb calorimeter
9. Estimation of dissolved oxygen
10. Determination of Eutectic Temperature of binary system (Urea – Benzoic Acid)

BOOKS:
1. Chemistry-lab manual by Dr K.N.Jayaveera and K.B. Chandra Sekhar, S.M. Enterprizes Ltd.

Equipment Required:
1. Glass ware: Pipettes, Burettes, Volumetric Flasks, Beakers, Standard flasks, Measuring jars, Boiling Test tubes, reagent bottles, (Borosil)
2. Analytical balance (keroy) (15 Nos)
3. Calorimeter
4. Bomb Calorimeter
5. Redwood viscometer No.1 & No.2
6. Conductometer/ Conductivity bridge
7. Wash bottles, test tube stands, burette stands
8. Gas cylinders with Bunsen burners
9. Chemicals: Hydrochloric acid, sodium hydroxide, EDTA, EBT indicator, fast sulfon black-f, urea, benzoic acid, methanol, Mohr’s salt, copper sulphate, magnesium sulphate, ammonia, ammonium sulphate, calcium sulphate etc.,
ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

The Language Lab focuses on the production and practice of sounds of language and equips students with the use of English in everyday situations and contexts.

Objectives:
1. To train students to use language effectively in everyday conversations, to participate in group discussions, to help them face interviews, and sharpen public speaking skills
2. To expose the students to a varied blend of self-instructional, learner-friendly modes of language learning
3. To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm
4. To initiate them into greater use of the computer in resume preparation, report-writing, format-making etc.
5. To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required ability to face computer-based competitive exams such GRE, TOEFL, GMAT etc.

SYLLABUS:

The following course content is prescribed for the English Language Laboratory sessions:

1. Introduction to the Sounds of English- Vowels, Diphthongs & Consonants.
2. Introduction to Stress and Intonation.
3. Situational Dialogues (giving directions etc.)
4. Speaking on the mobiles and telephone conversation
5. Role Play.
7. ‘Just A Minute’ Sessions (JAM).
8. Describing Objects / Situations / People.
9. Information Transfer
10. Debate

Minimum Requirement:
The English Language Lab shall have two parts:

i) The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self-study by learners.

ii) The Communication Skills Lab with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo –audio & video system and camcorder etc.

System Requirement (Hardware component):
Computer network with Lan with minimum 60 multimedia systems with the following specifications:

i) P – IV Processor
   a) Speed – 2.8 GHZ
   b) RAM – 512 MB Minimum
   c) Hard Disk – 80 GB

   ii) Headphones of High quality
PRESCRIBED SOFTWARE: GLOBARENA

Suggested Software:
• Cambridge Advanced Learners’ English Dictionary with CD.
• The Rosetta Stone English Library
• Clarity Pronunciation Power – Part I
• Mastering English in Vocabulary, Grammar, Spellings, Composition
• Dorling Kindersley series of Grammar, Punctuation, Composition etc.
• Language in Use, Foundation Books Pvt Ltd with CD
• Learning to Speak English - 4 CDs
• Microsoft Encarta with CD
• Murphy’s English Grammar, Cambridge with CD
• English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):

3. Speaking English Effectively by Krishna Mohan & NP Singh (Macmillan)
8. DELTA’s key to the Next Generation TOEFL Test, 6 audio CDS, New Age International Publishers, 2007

DISTRIBUTION AND WEIGHTAGE OF MARKS

English Language Laboratory Practical Paper:
1. The practical examinations for the English Language Laboratory shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the Language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 year-end Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The year- end Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the same institution.
UNIT – I


UNIT – II

UNIT – III


UNIT – IV

UNIT – V

UNIT – VI

UNIT – VII
Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Method of separation of variables – Solutions of one dimensional wave equation, heat equation and two-dimensional Laplace equation under initial and boundary conditions.
UNIT – VIII

TEXT BOOKS:

REFERENCES:
3. Introduction to Numerical Analysis – S.S. Sastry Printice Hall of India