

Detailed Program
Bachelor of Technology (B.Tech)
(Mechanical Engineering)

Semester-VI
(2016-20)

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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, 2019 along with examination pattern is as follows:

Course Scheme

Semester -VI

S. No.	Course Code	Course Title	L	T	P	Credits
1.	19007200	Machine Drawing	3	0	0	3
2.	19009700	Computer Aided Design	3	0	0	3
3.	19009800	Computer Aided Design Lab	0	0	2	1
4.	19009900	Power Plant Engineering	3	1	0	4
5.	19010000	Refrigeration and Air Conditioning	3	1	0	4
6.	19010100	Refrigeration and Air Conditioning Lab	0	0	4	2
7.	19009200	Engineering Economics	3	0	0	3
8.	19006400	Ability & Skill Enhancement VI	2	0	0	2
9.	99002700	Human Values & Social Service/NCC/NSS	-	-	-	1
10.	99002800	Workshops & Seminars	-	-	-	1
Total			17	2	6	24

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

The distribution of Internal Assessment Marks is as follows:

Type	Details	Marks
Mid Term	Two Mid-term Sessional of 15 marks each (15+15)	30
Marks obtained in various Tests, Assignments, Presentations, Quiz, Tutorials, etc.	Average of marks obtained	15
Attendance	75%+ : 5 marks	5
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	45
Attendance	75%+ : 5 marks	5
TOTAL	50	

External Assessment

Type	Marks
Practical	50

CURRICULUM

Course Name: Machine Drawing

Course Code: 19007200

Course Outline

Unit I: Drawing conventions

IS codes, sectional views and sectioning, surface finish and tolerances representation of machine parts such as external and internal threads, slotted heads, square ends, and flat radial ribs, slotted shaft, splined shafts, bearings, springs, gears, Rivet heads and Riveted joints, Welded joints, Drawing of Threaded fasteners.

Unit II: Assembly Drawing

Assembly Machine Drawing, Basic concept of assembly drawing, bill of materials, Assembly drawing of Cotter and Knuckle joints, pedestal and footstep bearings, Engine parts- crosshead and stuffing box, IC engines parts - piston and connecting rods; lathe machine parts-Tool post and Tail Stock.

Suggested Readings:

1. Machine Drawing- K.L. Narayana, P.Kannaiah & K.Venkata Reddy, New Age Publishers, 4th Edition, 2012. 2. Machine Drawing- Dhawan, S.Chand Publications, 1st Revised Edition,1998
2. Machine Drawing- P.S. Gill, S.K. Kataria& Sons, 17th Edition, 2012.
3. Machine Drawing- Luzzader, PHI Publishers,11thEdition.
4. Machine Drawing Rajput, S. Chand Pub

Course Name: Computer Aided Design

Course Code: 19009700

Course Outline

Unit I

Overview of Computer Graphics: Picture representation, Coordinate Systems, Output Graphics Display devices, Raster Scan Graphics- DDA for line generation and Bresenham's algorithm for line and circle generation.

Unit II

Wire Frame Models: Parametric representation of curves, Plane curves - line, circle, ellipse, parabola and hyperbola, Space curves - Cubic spline curve, Bezier Curve and B Spline Curves. Blending of Curves

Unit III

Surface Models and Entities: Parametric representation of Hermite Bicubic surfaces, Bezier surfaces and B-spline surfaces. Solid Models and Entities: Solid Representation - B-rep. and CSG, Comparison between three types of models.

Unit IV

Two- and Three-Dimensional Transformation of Geometric Models: Translation, Scaling Reflection, Rotation and Shearing, Homogeneous Representation, Combined Transformation, Projection of Geometric models Parallel and Perspective Projection.

Unit V

Clipping: Point clipping, Line clipping, Cohen- Sutherland algorithm etc., viewing transformation, hidden line and surface removal- Techniques and Algorithms.

Suggested Readings

1. Mathematical elements for Computer Graphics, Rogers and Adams, Tata McGraw Hill
2. CAD/CAM: Theory and Practice, Zeid and Siva Subramanian., Tata McGraw Hill
3. Elements of Computer Aided Design and Manufacturing, Pao Y.C., John Wiley and Sons.
4. CAD/CAM: Concepts and Applications, Alavala C.R., Prentice Hall of India.

Course Name: Computer Aided Design Lab

Course Code: 19009800

Laboratory Work

List of Experiments to be performed (Minimum five experiments) (2 Hour each)

1. Introduction and different features of the CAD Software.
2. Study of Capabilities of Software for Drafting & Modeling – Co-Ordinate System.
3. Initiating the Graphics Package; Setting the paper size, space; setting the limits, units;

4. Use of snap and grid commands.
5. Drawing of primitives (Line, arc, circle, ellipse, triangle etc.).
6. Creation of Simple Figures like polygon and General Multiline Figures.
7. Drawing a flange.
8. Assembly modeling.
9. Detailing.
10. Isometric and Orthographic projections.
11. Surface Modeling.
12. Creation of 3-D Models of Simple Objects and Obtaining 2-D Multiview Drawings From 3-D Model.

Course Name: Power Plant Engineering

Course Code: 19009900

Course Outline:

Unit I

Coal based thermal power plants, basic Rankine cycle and its modifications, layout of modern coal power plant, super critical boilers, FBC boilers, turbines, condensers, steam and heating rates, subsystems of thermal power plants, fuel and ash handling, draught system, feed water treatment, binary cycles and cogeneration systems.

Unit II

Gas turbine and combined cycle power plants, Brayton cycle analysis and optimization, components of gas turbine power plants, combined cycle power plants, Integrated Gasifier based Combined Cycle (IGCC) systems.

Unit III

Basics of nuclear energy conversion, Layout and subsystems of nuclear power plants, Boiling Water Reactor (BWR), Pressurized Water Reactor (PWR), CANDU Reactor, Pressurized Heavy Water Reactor (PHWR), Fast Breeder Reactors (FBR), gas cooled and liquid metal cooled reactors, safety measures for nuclear power plants.

Unit IV

Hydroelectric power plants, classification, typical layout and components, principles of wind, tidal, solar PV and solar thermal, geothermal, biogas and fuel cell power systems Energy, economic and environmental issues, power tariffs, load distribution parameters, load curve, capital and operating cost of different power plants, pollution control technologies including waste disposal options for coal and nuclear plants.

Suggested Readings

1. Nag P.K., Power Plant Engineering, 3rd ed., Tata McGraw Hill, 2008.
2. El Wakil M.M., Power Plant Technology, Tata McGraw Hill, 2010.
3. Elliot T.C., Chen K and Swanekamp R.C., Power Plant Engineering, 2nd ed., McGraw Hill, 1998.

Course Name: Refrigeration and Air Conditioning

Course Code: 19010000

Course Outline

Unit I: Vapour Compression and Air Cycle Refrigeration

Reversed Carnot cycle, air refrigeration cycle, aircraft refrigeration cycle, vapour compression refrigeration cycle, actual vapour compression cycle. Advanced Vapour Compression refrigeration systems, Compound compression and multi load systems; Cryogenics refrigeration, cascade system.

Unit II: Vapour Absorption Refrigeration

Water vapour refrigeration systems, steam jet refrigeration; vapour absorption refrigeration systems, single effect and double effect vapour absorption systems.

Unit III: Refrigerants

Desirable properties of common refrigerants, alternative refrigerants, refrigerator retrofitting procedure. Impact on environment by traditional refrigerants, refrigeration & associated equipment, concept of ozone depletion and global warming.

Unit IV: Refrigeration System Components

Compressors, expansion devices, condensers, evaporators.

Unit V : Air Conditioning

Psychometric properties of air, psychometric processes, comfort charts, air conditioning load calculations, types of air conditioning systems. Demonstration of HVAC software's related to psychometric processes & HVAC systems.

Suggested Readings:

1. Refrigeration and Air Conditioning by R.S. Khurmi, S. Chand & Co. Ltd.
2. Refrigeration and Air Conditioning by C. P. Arora, Tata McGraw Hill,
3. Refrigeration and Air Conditioning by A. R. Trott and T. C. Welch
4. Refrigeration and Air Conditioning Technology by Whitman, Johnson and Tomczak,
5. Refrigeration and Air Conditioning by Abdul Ameen, Prentice Hall of India Ltd,

Course Name: Refrigeration and Air Conditioning Lab

Course Code: 19010100

List of Experiments: (2 hours each)

1. Study & Performance of basic vapour compression Refrigeration Cycle.
2. To find COP of water cooler.
3. To study and perform experiment on vapour absorption apparatus.
4. To find the performance parameter of cooling tower.
5. To study various components in room air conditioner.
6. To find performance of a refrigeration test rig system by using different expansion devices.
7. To study different control devices of a refrigeration system.
8. To study various compressor.
9. To find the performance parameters of Ice Plant.
10. Perform the experiment & calculate various Performance parameters on a blower apparatus.

Course Name: Engineering Economics

Course Code: 19009200

Course Outline

Unit I: Engineering Economics

Definitions, Scope and Significance **Demand and Supply:** Meaning of Demand and supply, Determinants of demand and Supply **Demand Forecasting:** Purpose of Forecasting Demand, Determinants of demand forecasting, Methods of Demand Forecasting, Criteria for the good forecasting method.

Unit II: Cost of Production

Explicit and Implicit costs, Marginal, Incremental and Sunk costs, Opportunity cost, Short-run cost function, Total Average and Marginal costs, Long-run costs, Break-even analysis. **Theory of Production:** Law of Variable Proportions and Laws of returns to scale.

Unit III: Markets Structures and Pricing Theory

Pricing in Different Markets: Perfect competition, Monopoly, Monopolistic competition and Oligopoly. **Investment Decision:** Capital Budgeting, Methods of Project Appraisal (Payback Period, IRR, NPV, BCR).

Unit IV: National Accounting

Meaning, Methods and Current Trends **Inflation & Deflation:** Meaning, Measures and Impact on Indian economy.

Unit V: Globalization and Foreign Direct Investment

Meaning, Recent Indian Policy towards FDI and Globalization, Impact of FDI & Globalization on Indian Economy. **Exchange Rate:** Meaning, Determinants of exchange rate, Measurement of Exchange Rate. **Overview of Financial Markets:** Capital Market & Money Market.

Suggested Readings:

1. Salvatore, D. and Srivastav, R., Managerial Economics: Principles and Worldwide Applications, Oxford University Press, Sixth Edition (2008).
2. Peterson, H. Craig, Lewis, W. Chis and Jain, Sudhir K. Managerial Economics, Prentice Hall of India (2006).
3. Robert Pin Dyck and Daniel Rubin Feld Microeconomics, Prentice Hall (2009).
4. Pandey, I.M. Financial Management, Vikas Publication (2010).

Course Name: Ability and Skill Enhancement VI**Course Code: 19006400****Course Outline – Final Assessment – Report/Presentation****Unit I: Verbal Reasoning & English Aptitude**

Logical Sequence of Words, Verbal Analogy, Classification, Blood Relation Test, Syllogism, Reading Comprehension.

Unit II: Winning Attitude

Attitude is the most important thing for success, how to develop a winning attitude, what is it, when we need it, what is mindset, how to have a winning and positive mindset, how to win in difficult situations, Positive thinking, passion, dedication, confidence, well preparation, focus, hard work, planning, never give up, etc - some traits that help in developing winning attitude.

Unit III: Understanding the News

Reading Current News, Comparing & Analyzing the news, Write an editorial, News Vocabulary, Presentation on any major news (political/social/sports/economics).

Unit IV: Be a Journalist

Chat Show, Panel Discussion, Parliamentary debate, News Inspired Theatrical Performance.

Unit V: Report

Preparing a report on major National/International News – Insights/ review of major news papers and news channels.

Note: The review of Syllabus happens on periodic basis for the benefit of the students. In case there are changes in curriculum due to review, students would be intimated in writing.

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