2017.3.12   <u>शैक्षिक सत्र 2017-18 के आड सेमेस्टर के समस्त B.Tech. पाठ्यक्रमों हेतु बोर्ड आफ स्टडीज द्वारा अनुमोदित परीक्षकों की सूची का अवलोकन एवं विभिन्न स्नातक/परास्नातक पाठ्यक्रमों के सैलेबस में आंशिक संशोधन सहित सत्र 2017-18 एवं 2018-19 से प्रभावी किये जाने का अनुमोदन।</u>

शैक्षिक सत्र 2017-18 के आड सेमेस्टर के समस्त B.Tech. पाठ्यक्रमों हेतु विभागीय बोर्ड आफ स्टडीज द्वारा संस्तुत लिखित एवं प्रायोगिक परीक्षा का पैनल प्राप्त किया गया, जिसे मा0 कुलपति महोदय के अनुमोदनोपरान्त परीक्षा नियंत्रक को अग्रिम कार्यवाही हेतु प्रेषित किया गया।

विद्या परिषद के अनुमोदनार्थ निम्न प्रस्ताव प्रस्तुत है:-

1. रसायन अभि0 विभाग के चतुर्थ सेमेस्टर का पाठ्यक्रम विद्या परिषद के अवलोकनार्थ निम्नवत् पृष्ठ संख्या 117 से पृष्ठ संख्या 121 पर संलग्न है:-

विषय कोड	विषय का नाम	प्रभावी होने का सत्र
BCT - 15	Transport Phenomena	
BCT – 16	Sugar Technology	
BCT – 17	Chemical Engineering Thermodynamics	2017-18
BCT – 18	Heat Transfer Operation	

2. निम्न विभागो द्वारा पाठ्यक्रमों में किये गये संशोधन पृष्ठ संख्या 122 से पृष्ठ संख्या 133 पर संलग्न है। पाठ्यक्रमों का विवरण निम्नवत् है:-

विभाग	विषय कोड	विषय का नाम	प्रभावी होने का सत्र
प्रयुक्त विज्ञान विभाग	BAS-02 A	Engineering Physics - I	2018-19
	BAS-08 A	Engineering Physics -II	2018-19
	BAS-15 A	Applied Engineering Chemistry	2018-19
	BAS – 31	Advanced Mathematics & Statistics	2017-18
	BAS – 09 A	Engineering Chemistry	2018-19
विद्युतकण एवं संचार अभि0 विभाग	BEC – 01 A	Fundamentals of Electronics Engineering	2017-18

विद्या परिषद के माननीय सदस्यों से अनुरोध है कि कृपया उक्त का अनुमोदन प्रदान करने की कृपा करें।

Department of Electronics & Communication Engineering
M.M.M. University of Technology,
Gorakhpur

No.ECE/ 200 /2017

Date: 03/09/2017

Dean (UG Studies and Entrepreneurship)

The BOS meeting of Electronics & Communication Engineering Department is held today (03/09/2017) at 11.00 A.M. in the Department. Kindly find herewith the followings for further needful action.

1. The minutes of the meeting
2. The Panel of Theory /Practical Examiners of B.Tech. ODD Semester session 2017-2018.
3. The Panel of Practical Examiners (Examiner-I and Examiner-II) for Practical Evaluation of B.Tech. students (Practical based theory subjects)

4. Course Syllabus of "Fundamentals of Electronics Engineering" Subject Code-BEC-01 (L-3, T-1, P-2) is modified and revised syllabus is attached herewith.

(G.S. Tripathi)
Head

Revised

BEC-01 FUNDAMENTALS OF ELECTRONICS ENGINEERING

Course category: Engineering Fundamentals (EF)

Pre-requisite Subject: NIL

Contact hours/week: Lecture: 3, Tutorial: 1, Practical: 2

Number of Credits: 5

Course Assessment methods: Continuous assessment through tutorials, attendance, home assignments, quizzes, practical work, record, viva voce and Three Minor tests and One Major Theory & Practical Examination

Course Outcomes: The students are expected to be able to demonstrate the following knowledge, skills and attitudes after completing this course

1. Able to identify schematic symbols and understand the working principles of electronic devices, e.g., Diode, Zener Diode, LED, BJT, JFET and MOSFET etc.

2. Able to understand the working principles of electronic circuits e.g. Rectifiers, Clipper, Clamper, Filters, Amplifiers and Operational Amplifiers etc. also understand methods to analyse and characterize these circuits

3. Able to understand the functioning and, purposes of Power Supplies, Test and Measuring equipments such as multimeters, CROs and function generators etc.

4. Able to rig up and test small electronics circuits.

Topics Covered

UNIT-I
(9)

Semiconductor materials and properties: electron-hole concepts, Basic concepts of energy bands in materials, concept of forbidden gap, Intrinsic and extrinsic semiconductors, donors and acceptors impurities, Junction diode, p-n junction, depletion layer, v-i characteristics, diode resistance, capacitance, diode ratings (average current, repetitive peak current, non-repetitive current, peakinverse voltage), Diode Applications in rectifier, filters, voltage multipliers, load regulators, clipper and clamper circuits, Breakdown mechanism (Zener and avalanche), breakdown characteristics, Zener resistance, Zener diode ratings, Zener diode application as shunt regulator

UNIT-II
(9)

Bipolar Junction Transistor (BJT): Basic construction, transistor action, CB, CE and CC configurations, input/output characteristics, Biasing of transistors-fixed bias, emitter bias, potential divider bias, comparison of biasing circuits, Transistor Amplifier: Graphical

analysis of CE amplifier, concept of voltage gain, current gain, h- parameter model (low frequency), computation of Ai, Av, Ri, Ro of single transistor CE and CC amplifier configurations.

UNIT-III   (9)

Field Effect Transistors(JFET and MOSFET): Basic construction, transistor action, concept of pinch off, maximum drain saturation current, input and transfer characteristics, characteristic equation CG, CS and CD configurations, fixed & self-biasing, MOSFET: depletion and enhancement type MOSFET-construction, operation and characteristics. Computation of Av, Ri, Ro, of single FET amplifiers using all the three configurations.

Operational Amplifiers: Concept of ideal operational amplifiers, ideal op-amp parameters, inverting, non-inverting and unity gain amplifiers, adders, difference amplifiers, integrators

UNIT-IV   (9)

Switching theory and logic design: Number systems, conversion of bases, Boolean algebra, logic gates, concept of universal gate, canonical forms, Minimization using K-map Operational Amplifiers

Electronics Instruments: Working principle of digital voltmeter, digital multimeter (block diagram approach), CRO (its working with block diagram), measurement of voltage, current, phase and frequency using CRO

EXPERIMENTS:

Note: Minimum Eight experiments are to be performed

1. To Plot the forward/Reverse Characteristics of SiP-N junction diode.

2. To Plot the forward/Reverse Characteristics of Zener diode

3. Study and plot the characteristic of Zener diode as voltage regulator

4. Study of half wave rectifier and draw the nature of input / output signal. Calculate the value of Idc, Irms and ripple factor.

5. Study of Full wave rectifier and draw the nature of input / output signal. Calculate the value of Idc, Irms and ripple factor.

6. Study of Bridge Rectifier and draw the nature of input / output signal. Calculate the value of Idc, Irms and ripple factor.

7. Draw input and output characteristic curve of n-p-n transistor in CE configuration

8. Draw input output characteristic curve of n-p-n transistor in CB configuration

9. Draw the drain and transfer curve of JFET

10. Study of OP-AMP (741) and calculate the gain in (i) Inverting mode and (ii) Non inverting mode

11. Study of OP-AMP as a (i) Summer (ii) Integrator (iii) Differentiator; and plot the nature of 12 input & output waveform

12. Study of CRO and multi-meter measurement voltage. frequency. phase difference using CRO along with the testing of electronics component.

Books & References

1. Electronic Devices and Circuits-Boylestad and Nashelsky. 6e. PHI. 2001.

2. Electronic Devices and Circuits. A Mottershead. PHI. 2000. 6e.

3. Digital Computer Design. Morris Mano. PHI. 2003.

4. Electronic Instrumentation-H.S. Kalsi. 2e. TMH. 2007.

2018.1.12

शैक्षिक सत्र 2017–18 के इवेन सेमेस्टर के समस्त **B.Tech.** पाठ्यक्रमों हेतु बोर्ड आफ स्टडीज द्वारा अनुमोदित परीक्षकों की सूची का अवलोकन एवं विभिन्न स्नातक पाठ्यक्रमों के सैलेबस में आंशिक संशोधन सहित सत्र 2018–19 से प्रभावी किये जाने एवं बी0टेक0 केमिकल इंजी0 के पंचम सेमेस्टर के सैलेबस का अनुमोदन।

शैक्षिक सत्र 2017–18 के इवेन सेमेस्टर के समस्त B.Tech. पाठ्यक्रमों हेतु विभागीय बोर्ड आफ स्टडीज द्वारा संस्तुत लिखित एवं प्रायोगिक परीक्षा का पैनल प्राप्त किया गया, जिसे मा0 कुलपति महोदय के अनुमोदनोपरान्त परीक्षा नियंत्रक को अग्रिम कार्यवाही हेतु प्रेषित किया जायेगा।

विद्या परिषद के अनुमोदनार्थ निम्न प्रस्ताव प्रस्तुत है:-

1. रासायन अभि0 विभाग के पंचम सेमेस्टर का पाठ्यक्रम विद्या परिषद के अवलोकनार्थ निम्नवत् पृष्ठ संख्या **126** से पृष्ठ संख्या **135** पर संलग्न है:-

विषय कोड	विषय का नाम	प्रभावी होने का सत्र
BCT – 25	Chemical Technology	
BCT – 26	Mass Transfer – I	
BCT – 27	Suger Production	2018-19
BCT – 28	Chemical Engineering Thermodynamics - II	

2. निम्न विभागो द्वारा पाठ्यक्रमों में किये गये संशोधन पृष्ठ संख्या **136** से पृष्ठ संख्या **147** पर संलग्न है। पाठ्यक्रमों का विवरण निम्नवत् है:-

विभाग	विषय कोड	विषय का नाम	प्रभावी होने का सत्र
विद्युतकण एवं संचार अभि0 विभाग	BEC-28 A	Principles of Communication	
	BEC-32 A	Microprocessors & Applications	2018-19
	BEC-31 A	Digital Communication	
	BEC-26 A	Control Systems	
	BEC-67 A	RFICs	
विद्युत अभि0 विभाग	BEE – 14 A	Network Analysis and Synthesis	
	BEE – 15 A	Microprocessor: Architecture, Programming and Interfacing	2018-19
	BEE – 20 A	Simulation Techniques Lab	
प्रयुक्त विज्ञान विभाग	BAS –11 A	Human Values & Professional Ethics	2018-19

3. विद्युत अभि0 विभाग के बी0टेक0 चतुर्थ वर्ष, अष्टम सेमेस्टर के विषय BEE-44 (Utilization & Traction) जो लिपिकीय त्रुटिवश बी0टेक0 विद्युत अभि0 के क्रेडिट स्ट्रक्चर में 4 क्रेडिट के स्थान पर 5 क्रेडिट का अंकित हो गया है, संशोधन हेतु पृष्ठ संख्या **147a** से पृष्ठ संख्या **147e** पर संलग्न है।

विद्या परिषद के माननीय सदस्यों से अनुरोध है कि कृपया उक्त का अनुमोदन प्रदान करने की कृपा करें।

Department of Electronics & Communication Engineering
M.M.M. University of Technology,
Gorakhpur

No.ECE 2 5 /2018   Date: 29/01/2018

Dean (UG Studies and Entrepreneurship)

The BOS meeting of Electronics & Communication Engineering Department is held today (03/09/2017) at 11.00 A.M. in the Department. Kindly find herewith the followings for further needful action.

1. The minutes of the meeting

2. The Panel of Theory /Project Examiners of B.Tech. Even Semester session 2017-2018.

3. The Panel of Practical Examiners (Examiner-I and Examiner-II) of B.Tech Even Semester 2017-2018

4. The revised Course Syllabus of Five B.Tech. subjects i.e. "Principles of Communication" (BEC-28), Microprocessors & Applications (BEC-32), Digital Communication (BEC-31), Control Systems (BEC-26) and RFICs (BEC-67).

(G.S. Tripathi)
Head

The BOS meeting of Electronics & Communication Engineering Department held in the chamber of HOD on dated 27/01/2018 at 11.00 A.M.

The following members were present:-

1. Sri G.S.Tripathi.   HOD/ Chairman
2. Sri Gurumukh Singh.   External Member
3. Sri Rahul Singh.   External Member
4. Prof. R. K. Chauhan.   Member
5. Dr. Brijesh Kumar.   Member
6. Dr. Manish Kumar.   Member
7. Sri Rajan Mishra.   Member
8. Sri Gagan Deep Bharti.   Member
9. Dr. Sudhanshu Verma.   Member
10. Dr. Dharmendra Kumar.   Member
11. Sri Anupam Sahu.   Member
12. Dr. B.P.Pandey.   Member

Following matters were discussed and finalized.

1. The Panel of Theory Examiners of B.Tech. Even semester session 2017-2018 are finalized.

2. The Panel of Practical Examiners (Examiner-I and Examiner-II) for Practical Evaluation of B.Tech. students are finalized.

3. The Panel of Theory/Dissertation Examiners of M.Tech. (Digital Systems) and M.Tech. (Communication Engg.) Even semester session 2017-2018 are finalized.

4. The Panel of Practical Examiners of M.Tech. (Digital Systems) and M.Tech. (Communication Engg.) Even semester session 2017-2018 are finalized.

5. Course Syllabus of Five B.Tech. subjects are revised considering some of the recommendations of Curriculum workshop i.e.-"Principles of Communication" (BEC-28), Microprocessors & Applications (BEC-32), Digital Communication (BEC-31), Control Systems (BEC-26|) and RFICs (BEC-67).

    Meeting ended with thanks to the chair.

                                                           (G.S. Tripathi)
                                                               Head

BEC-28	PRINCIPLES OF COMMUNICATION

Course category	:	Department Core (DC)
Pre-requisite Subject	:	Signals & Systems (BEC-13)
Contact hours/week	:	Lecture : 3, Tutorial : 1 , Practical: 2
Number of Credits	:	5
Course Assessment methods	:	Continuous assessment through tutorials, attendance, home assignments, quizzes, practical work, record, viva voce and Three Minor tests and One Major Theory & Practical Examination
Course Outcomes	:	The students are expected to be able to demonstrate the following knowledge, skills and attitudes after completing this course

1. Acquired knowledge about analog communication.

2. Acquired knowledge about AM transmission and reception.

3. Acquired knowledge about FM and PM transmission and reception.

4. Acquired knowledge about pulse modulation.

5. Acquired knowledge about noise.

Topics Covered

UNIT-I	9

Amplitude Modulation: Overview of Communication system, Communication channels, Need for modulation, Baseband and Pass band signals, Comparison of various AM systems, Amplitude Modulation: Double side-band with Carrier (DSB-C), Double side-band without Carrier, Single Side-band Modulation, Modulators and Demodulators, Vestigial Side-band (VSB), Quadrature Amplitude Modulator.

UNIT-II	9

Introduction to Angle Modulation: Frequency modulation, Narrowband and Wideband FM, Generation of FM waves, Indirect FM and direct FM, FM modulators and demodulators, Phase locked loop, Angle Modulation by Arbitrary Message Signal, Phase Modulation, Pre-emphasis and De-emphasis, Linear and Nonlinear Modulation, Comparison between Angle Modulation and Amplitude Modulation, Radio Receivers.

UNIT-III	9

Noise: Source of Noise, Frequency domain, Representation of noise, Linear Filtering of noise, Noise in Amplitude modulation system, Noise in SSB-SC,DSB and DSB-C, Noise Ratio, Noise Comparison of FM and AM, Pre-emphasis and De-emphasis, Figure of Merit.

UNIT-IV	9

Pulse Modulation and Digital Transmission of Analog Signal: Sampling Theorem and its applications, Concept of Pulse Amplitude Modulation, Pulse width modulation and pulse position modulation, PCM, Pulse Time Modulation, TDM and FDM, Line Coding, Quantizer, Quantization Noise, Compounding multiplexer.

EXPERIMENTS

1. To study Amplitude modulation using a transistor and determine depth of modulation.
2. To study envelope detector for demodulation of AM signal and observe diagonal peak clipping effect.
3. To study frequency modulation using reactance modulator.
4. Study of frequency modulation using varactor modulator.
5. Narrow band FM generator using Armstrong method.
6. Study of Foster- Seely discriminator.
7. Generation of DSB-SC signal using balanced modulator.
8. Generation of single side band signal.

9.	Study of phase locked loop and detection of FM signal using PLL.
10.	Measurement of noise figure using a noise generator.
11.	Study of superheterodyne AM receiver and measurement of sensitivity, selectivity & fidelity.
12.	Study and demonstration of active filter (low pass, high pass, and band pass type).

Books & References

1. H. Taub, D L. Schilling, GoutomSaha, "Principles of Communication", 3e, Tata McGraw-Hill Publishing Company Ltd.
2. B.P. Lathi, "Modern Digital and Analog communication Systems", 3e, Oxford University Press, 2009.
3. Simon Haykin, "Communication Systems", 4e, Wiley India.
4. H. P. HSU & D. Mitra, "Analog and Digital Communications", 2e, Tata McGraw-Hill Publishing Company Ltd.

BEC-32   MICROPROCESSORS & APPLICATIONS

Course category	:	Department Core (DC)
Pre-requisite Subject	:	Digital Electronics and Circuits (BEC-12)
Contact hours/week	:	Lecture : 3, Tutorial : 1 , Practical: 2
Number of Credits	:	5
Course Assessment methods	:	Continuous assessment through tutorials, attendance, home assignments, quizzes, practical work, record, viva voce and Three Minor tests and One Major Theory & Practical Examination
Course Outcomes	:	The students are expected to be able to demonstrate the following knowledge, skills and attitudes after completing this course

1. Acquired knowledge about Microprocessors and its need.

2. Ability to identify basic architecture of different Microprocessors.

3. Foster ability to write the programming using 8085 microprocessor.

4. Foster ability to understand the internal architecture and interfacing of different peripheral devices with 8085 Microprocessor.

5. Foster ability to write the programming using 8086 microprocessor.

6. Foster ability to understand the internal architecture and interfacing of different peripheral devices with 8086 Microprocessor.

Topics Covered

UNIT-I   9

Introduction to Microprocessors: Evolution of Microprocessors, Microprocessor Architecture and its operations, Memory devices, I/O Devices, 8-bit Microprocessor (8085): Introduction, Signal Description, Register Organization, Architecture, Basic Interfacing Concepts for Memory and I/O Devices

UNIT-II   9

8085 Assembly Language Programming: Instruction Classification, Instruction Format, Addressing Modes,8085 Instructions: Data Transfer operations, Arithmetic operations, Logic Operations, Branch operation, Flow Chart, Writing assembly language programs, Programming techniques: looping, counting and indexing.

UNIT-III   9

16-bit Microprocessors (8086/8088): Architecture, Physical address segmentation, memory organization, Bus cycle, Addressing modes, difference between 8086 and 8088, Introduction to 80186 and 80286, Assembly Language Programming of 8086/8088.

UNIT-IV   9

Data Transfer Schemes: Introduction, Types of transmission, 8257 (DMA), 8255 (PPI), Serial Data transfer (USART 8251), Keyboard-display controller (8279), Programmable Priority Controller (8259) Programmable Interval Timer/ Counter (8253/8254): Introduction, modes, Interfacing of 8253, applications, ADC and DAC

EXPERIMENTS

1. Write a program using 8085 Microprocessor for Decimal addition and subtraction of two numbers.

2. Write a program using 8085 Microprocessor for Hexadecimal addition and subtraction of two

numbers.

3. Write a program using 8085 Microprocessor for addition and subtraction of two BCD numbers.
4. To perform multiplication and division of two 8 bit numbers using 8085.
5. To find the largest and smallest number in an array of data using 8085 instruction set.
6. To write a program to arrange an array of data in ascending order.
7. To convert given Hexadecimal number into its equivalent ASCII number and vice versa using 8085 instruction set.
8. To write a program to initiate 8251 and to check the transmission and reception of character.
9. To interface 8253 programmable interval timer to 8085 and verify the operation of 8253 in six different modes.
10. To interface 8255 with 8085 and verify the operation of 8255 in different modes.
11. To interface 8259 with 8085 and verify the operation of 8259.
12. Serial communication between two 8085 microprocessors through RS-232 C port.

Books & References

1. R. S. Gaonkar: Microprocessor Architecture, Programming and Applications with 8085. Penram Publication
2. R. Singh and B. P. Singh: Microprocessor Interfacing and Application. New Age International Publishers.
3. D. V. Hall: Microprocessors and Interfacing, TMH (2nd Edition).
4. Y.C. Liu and G.A. Gibson: Microcomputer Systems: The 8086/8088 Family: Architecture, Programming and Design. PHI 2nd Edition.

27/1/18

BEC-31	DIGITAL COMMUNICATION

Course category	:	Department Core (DC)
Pre-requisite Subject	:	Principles of Communication (BEC-28)
Contact hours/week	:	Lecture : 3, Tutorial : 1 , Practical: 2
Number of Credits	:	5
Course Assessment methods	:	Continuous assessment through tutorials, attendance, home assignments, quizzes, practical work, record, viva voce and Three Minor tests and One Major Theory & Practical Examination
Course Outcomes	:	The students are expected to be able to demonstrate the following knowledge, skills and attitudes after completing this course

1. Able to compute the bandwidth and transmission power by analysing time and frequency domain spectra of signal required under various modulation schemes.

2. Able to apply suitable modulation schemes and coding for various applications.

3. Able to identify and describe different techniques in modern digital communications, in particular in source coding, modulation and detection, carrier modulation, and channel coding.

4. Able to analyze digital modulation techniques by using signal processing tools.

Topics Covered	
UNIT-I	9
Sampling Theorem and PCM Overview of digital communication. Sampling Principles, Practical aspects of sampling and signal recovery. Nyquist Criterion. Baseband Binary transmission. Intersymbol Interference. Quantization and Quantization noise. PCM. Differential PCM. Delta modulation, Adaptive Delta Modulation. Line coding review, Pulse shaping	
UNIT-II	9
Probability theory and Random Variables, Random variable. Statistical averages. Correlation. Sum of Random Variables. Central Limit Theorem. Random Process. Classification of Random Processes. Power spectral density. Multiple random processes. Gaussian Process. Probability Density function.	
UNIT-III	9
Digital Modulation Techniques: Digital Modulation formats, Digital carrier system. Method of generation and detection of coherent & non-coherent binary ASK, FSK & PSK. Differential phase shift keying. quadrature modulation techniques. (QPSK and MSK). M-ary Digital carrier Modulation. Matched Filter and Correlation reciever Spread spectrum systems. Frequency Hopping Spread Spectrum (FHSS) systems. Direct Sequence Spread Spectrum systems. Code Division Multiple Access ,Basic Principle of OFDM .	
UNIT-IV	9
Information Theory and Coding: Information Measurement, Average information and information rate. Coding for discrete memoryless source, continuous channel capacity. Maximum entropy. Huffman and Fano coding. Discrete channel capacity. Trade off between S/N and bandwidth. Block code. Hamming code. Cyclic code. Convolutional code Tree diagram. State diagram, Trellis diagram, Viterbi encoder and decoder. Turbo Codes.	

EXPERIMENTS
1. Study of Sample and hold circuit using Op-amp- ST2101
2. Study of PAM generation and detection and observe characteristics of both single and dual polarity pulse amplitude modulation.
3. Study of pulse width modulation and demodulation.
4. Study of pulse position modulation demodulation.
5. Study of delta modulation and demodulation and observe effect of slope overload DCL-07.
6. Study of pulse data coding techniques for NRZ formats.

7.	Data decoding techniques for NRZ formats. ST2106-7.
8.	Study of amplitude shift keying modulator and demodulator.
9.	Study of frequency shift keying modulator and demodulator.
10.	Study of phase shift keying modulator and demodulator ST-467.
11.	Study of single bit error detection and correction using Hamming code. ST-2103.
12.	Study of Pulse code modulation and demodulation

Books & References

1.	Haykin, Simon, "Communication Systems", John Wiley, 4e.
2.	Singh, R.P. &Sapre, S.D. "Communication Systems: Analog & Digital", Tata McGraw-Hill.
3.	Lathi, B.P. "Modern Digital & Analog Communication Systems", Oxford University Press.
4.	Taub& Schilling, "Principles of Communication Systems", Tata McGraw-Hill
5.	Prokis J.J, "Digital Communications", McGraw Hill

BEC-26	CONTROL SYSTEMS	
Course category	:	Department Core (DC)
Pre-requisite Subject	:	NIL
Contact hours/week	:	Lecture : 3, Tutorial : 1 , Practical: 2
Number of Credits	:	5
Course Assessment methods	:	Continuous assessment through tutorials, attendance, home assignments, quizzes, practical work, record, viva voce and Three Minor tests and One Major Theory & Practical Examination
Course Outcomes	:	The students are expected to be able to demonstrate the following knowledge, skills and attitudes after completing this course

1. Describe the response characteristic and differentiate between the open loop and closed loop of a control system.

2. Derive mathematical model for simple electrical and mechanical systems using transfer function and state variable method.

3. Determine the response of a control system using poles and zeros to determine the response of a control system.

4. Determine the stability of a control system using Routh-Hurwitz method.

Topics Covered	
UNIT-I	9
Basic Components of a control system, Feedback and its effect, Types of feedback control Systems, Block diagrams: representation and reduction, Signal Flow Graphs, Modeling of Physical Systems: Electrical Networks and Mechanical Systems, Force-voltage analogy, Force-current analogy.	
UNIT-II	9
Time response of continuous data systems, Different test Signals for the time response, Unit step response and Time-Domain Specifications, Time response of a first-order and second order systems for different test signals, Steady State Error and Error constants, Sensitivity, Control Actions: Proportional, Derivative, Integral and PID control.Introduction to Process Control Systems, Pneumatic hydraulics, Actuators.	
UNIT-III	9
Stability: Methods of determining stability, Routh Hurwitz Criterion, Root Locus, Frequency Domain Analysis: Resonant Peak, Resonant frequency and Bandwidth of the second order system, Effect of adding a zero and a pole to the forward path, Nyquist Stability Criterion, Relative Stability: Gain Margin and Phase Margin, Bode Plot.	
UNIT-IV	9
State-Space Analysis of Control System: Vector matrix representation of state equation, State transition matrix. Relationship between state equations and high-order differential equations, Relationship between state equations and transfer functions, Block diagram representation of state equations, Decomposition Transfer Function, Kalman's Test for controllability and observability	

EXPERIMENTS

1. To determine transfer function of (Metadyne) cross-field generator set & study of various associated characteristics.
2. To study the synchros in various configurations from application point view
3. To study the D.C. Servo-position control system with P & PI configurations
4. To study the A.C. Servo motor and determine the Speed-Torque Characteristics.
5. To study 1st order and 2nd order system time response using MATLAB software.
6. To study Root Locus Plot using MATLAB software.
7. To study Frequency response Plot (Polar plot, Nyquist plot, Bode plot) using MATLAB software.

Books & References

1. B.C. Kuo&FaridGolnaraghi, "Automatic Control Systems", 8e, John Wiley India, 2008.
2. I.J. Nagrath&M.Gopal, "Control System Engineering", New Age International Publishers.
3. William A. Wolovich, "Automatic Control Systems", Oxford University Press, 2010.
4. Katsuhiko Ogata, "Modern Control Engineering", 3e, PHI Publication, 2000.

BEC-67 RF ICs

Course category	Programme Electives (PE4)
Pre-requisite Subject	NIL
Contact hours/week	Lecture : 3, Tutorial : 1 , Practical: 0
Number of Credits	4
Course Assessment methods	Continuous assessment through tutorials, attendance, home assignments, quizzes and Three Minor tests and One Major Theory Examination
Course Outcomes	The students are expected to be able to demonstrate the following knowledge, skills and attitudes after completing this course

1. Possess a basic knowledge of RF systems used in telecommunication industries.
2. Understand the concepts of various components of circuits used in RF systems.
3. Understand the methodology of using analog and digital modulation of an RF carrier.
4. Understand the basic RF characterization utilizing gain, bandwidth, noise, phase noise, S parameters.
5. Design LNAs, power amplifiers, mixer, multipliers, oscillators used in RF systems.
6. Design basic RF circuits at the chip level.

Topics Covered	Lectures
UNIT-I	9
Introduction to RF and Wireless Technology: Complexity comparison, Design bottle necks, Applications, Analog and digital systems, Choice of Technology. Basic concepts in RF Design: Nonlinearity and time variance, ISI, Random process and noise, sensitivity and dynamic range, passive impedance transformation.	
UNIT-II	9
Low Noise Amplifiers: Gain, Linearity, stability and bandwidth considerations; LNA Topologies; Non-linearities calculation	
UNIT-III	9
Mixers, Oscillators and Frequency synthesizers: performance parameters, noise figure, down conversion and upconversion mixers	
UNIT-IV	9
Power Amplifiers: General considerations, linear and nonlinear PAs, classification, High Frequency power amplifier, large signal impedance matching, linearization techniques.	

Books & References
1. Behzad Razavi, RF Microelectronics Prentice Hall of India, 2001.
2. Thomas H. Lee, The Design of CMOS Radio Integrated Circuits, Cambridge University Press.

2018.2.19 विश्वविद्यालय के आगामी शैक्षणिक सत्र 2018–19 हेतु विभिन्न विभागो द्वारा स्नातक पाठ्यक्रमों में किये गये संशोधनों (स्नातक पाठ्यक्रमों में कोई नया विषय आरम्भ किया जाना है, किसी विषय के **Credit Structure** में कोई संशोधन किया जाना है अथवा किसी विषय के पाठ्यक्रम में संशोधन) तथा बी0टेक0 केमिकल इंजी0 के पंचम सेमेस्टर पर विचार एवं अनुमोदन।

विश्वविद्यालय के आगामी शैक्षणिक सत्र 2018–19 हेतु विभिन्न विभागो द्वारा स्नातक पाठ्यक्रमों में किये गये संशोधनों (स्नातक पाठ्यक्रमों में कोई नया विषय आरम्भ किया जाना है, किसी विषय के Credit Structure में कोई संशोधन किया जाना है अथवा किसी विषय के पाठ्यक्रम में संशोधन) तथा बी0टेक0 केमिकल इंजी0 के पंचम सेमेस्टर पर विचार एवं अनुमोदन।

1. निम्न विभागो द्वारा अपने बी0टेक0 पाठ्यक्रमों के सैलेबस में किये गये संशोधन पृष्ठ संख्या 234 से पृष्ठ संख्या 347 पर संलग्न है। पाठ्यक्रमों का विवरण निम्नवत् है:-

विभाग	पाठ्यक्रम	प्रभावी होने का सत्र
जनपदीय अभियंत्रण विभाग	बी0टेक0	2018-19
यांत्रिक अभि0 विभाग	बी0टेक0	2018-19
केमिकल इंजी0 विभाग	बी0टेक0 (तृतीय, चतुर्थ एवं पंचम सेमेस्टर)	2018-19

2. रासायन अभि0 विभाग के षष्ठम् सेमेस्टर का पाठ्यक्रम विद्या परिषद के अवलोकनर्थ

विषय कोड	विषय का नाम	प्रभावी होने का सत्र
BCT - 31	Alcohol Technology	
BCT – 32	Mass Transfer - II	
BCT – 33	Process Dynamics, Control & Instruementation	2018-19
BCT – 34	Chemical Reaction Engineering	

3. बी0 टेक0, रासायन अभियंत्रण विभाग के द्वितीय वर्ष के छात्रों हेतु सत्र 2018-19 से आरम्भ किये जा रहें आडिट विषय Polymer Chemistry (BAS-32) के सैलेबस का अनुमोदन।

विद्या परिषद के माननीय सदस्यों से अनुरोध है कि कृपया उक्त का अनुमोदन प्रदान करने की कृपा करें।

The BOS meeting of Electronics & Communication Engineering Department held in the chamber of HOD on dated 22/05/2018 at 11.30 A.M.
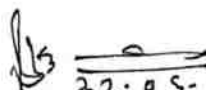
The following members were present:-

1. Prof. Sanjay Kumar Soni, HOD/ Chairman
2. Dr R. K Singh, Special Invitee
3. Sh Gurmukh Singh, External Member
4. Sri Rahul Singh, External Member
5. Prof. R. K. Chauhan, Member
6. Sri G.S.Tripathi
7. Dr. Manish Kumar, Member
8. Sri Rajan Mishra, Member
9. Sri Gagan Deep Bharti, Member
10. Dr. Sudhanshu Verma, Member
11. Dr. Pooja Lohia, Member
12. Dr. Dharmendra Kumar, Member
13. Dr. B.P. Pandey, Member

Following matters were discussed and finalized.

1. The M. Tech Syllabi for both Digital Systems and Communication Engineering were discussed and modified. The modified syllabus was finally approved.
2. Vision, Mission and PEOs of the department were discussed and approved.

Meeting ended with thanks to the chair.

22.05.2018

(Prof. Sanjay Kumar Soni)
Head

DEPARTMENT OF APPLIED SCIENCES
MADAN MOHAN MALAVIYA UNIVERSITY OF TECHNOLOGY
GORAKHPUR

Minutes of Board of Studies of Department of Applied Sciences M.M.M. University of Technology, Gorakhpur held on Dated: 23.09.2017

The Following were present:-

1.	Dr. B. K. Pandey	Chairman
2.	Prof. D. K. Dwivedi	Member Internal
3.	Dr. D. Kandu	Member Internal
4.	Dr. P.P. Pande	Member Internal
5.	Dr. S.P. Singh	Member Internal
6.	Dr. A.K Barnwal	Member Internal
7.	Dr Harish chandra	Member Internal
8.	Sri Ravi Kumar Gupta	Member Internal
9.	Dr. Krishna Kumar	Member Internal
10.	Dr. Abhijit Mishra	Member Internal
11.	Dr. Abhishek Kr. Gupta	Member Internal
12.	Dr. Ram Keval	Member Internal
13.	Prof Sanjay Chaubey	Member External
14.	Prof G. Anantharaman	Member External

The Following decisions were taken

1. The list of Examiners for Theory & Practical Examination of Physics, Chemistry, Mathematics, & Humanities for ODD Semester 2017-18 sessions was prepared.
2. The revised syllabus of Engineering Physics BAS-02 and BAS-08 has been recommended, which will be effective from the session 2018-19.
3. The revised syllabus of Applied Engineering Chemistry BAS-15 has been recommended, which will be effective from the session 2018-19.
4. The recommendation of emergent BOS regarding the syllabus of Advanced Mathematics & Statistics BAS-31 effective from session 2017-18 has been confirmed.
5. The revised syllabus of Engineering Chemistry BAS-09 has been recommended, which will be effective from the session 2018-19.

The meeting ended with thanks to the chairman

Letter No.MUT/Appl. Sc./BOS/   /2017

Dated: Sept 23 , 2017

HASD 23-8-17

Copy forwarded for information & necessary action to:-
   1. Dean UG&E

HASD 23-8-17

6

BAS-02 A   ENGINEERING PHYSICS-I

Course category	:	Basic Science and Math's (BSM)
Pre-requisites	:	NIL
Contact hours/week	:	Lecture : 3. Tutorial : 1 . Practical: 2
Number of Credits	:	5
Course Assessment methods	:	Continuous assessment through tutorials. assignments. quizzes and Three Minor tests and One Major Theory & Practical Examination
Course Outcomes	:	The students are expected to be able to demonstrate the following knowledge, skills and attitudes after completing this course

1. Basics of relativity and its application in Engineering
2. Quantum Mechanics and its application to understand material properties
3. Statistical mechanics and its application in study of Macro and Micro scale properties of Matter.
4. Use of the principle of optics in the measurement.
5. Applications of Laser and holography in Engineering.
6. Basic principle of optical fiber and its applications.

Topics Covered

UNIT-I

Relativistic Mechanics

9

Relativistic Mechanics: Inertial and Non-inertial Frames of reference. Galilean transformation. Michelson-Morley Experiment. Postulates of special theory of relativity. Lorentz Transformation. Length contraction. Evidences of length contraction. Time dilation. Evidences for time dilation. Relativistic velocity transformation. Relativistic variation of mass with velocity. Relativistic kinetic energy. Mass energy equivalence. Examples from nuclear physics. Relativistic energy-momentum relation.

UNIT-II

Quantum Mechanics

9

De Broglie waves and Group velocity concept. Uncertainty principle and its application. Davisson-Germer experiment. Derivation of Schrodinger equation for time independent and time dependent cases. Postulates of quantum mechanics. Significance of wave function. Application of Schrodinger wave equation for a free particle (one dimensional and three dimensional case). Particle in a box (one dimensional). Simple harmonic oscillator (one dimensional).

UNIT-III

Physical Optics

9

Interference: Interference of light. Interference in thin films (parallel and wedge shaped film). Newton's rings, refractive index and wavelength determination.
Diffraction: Single, double and N- Slit Diffraction. Diffraction grating. Grating spectra. dispersive power. Rayleigh's criterion and resolving power of grating.

Polarization: Phenomena of double refraction. Nicol prism. Production and analysis of plane. circular and elliptical polarized light. Retardation Plate. Polarimeter

UNIT-IV

Modern Optics

Laser: Spontaneous and stimulated emission of radiation. population inversion. concept of 3 and 4 level Laser. construction and working of Ruby. He-Ne lasers and laser applications.

Fiber Optics: Fundamental ideas about optical fiber. Propagation mechanism. Acceptance angle and cone. Numerical aperture. Propagation Mechanism and communication in fiber Single and Multi Mode Fibers. step index and graded index fiber.

Holography: Basic Principle of Holography. Construction and reconstruction of Image on hologram and applications of holography.

9

EXPERIMENTS

1. To determine the wavelength of monochromatic light by Newton's Ring
2. To determine the specific rotation of cane sugar solution using polarimeter
3. To determine the wavelength of spectral lines using plane transmission grating.
4. To verify Brewster's law using rotating Nicol prism
5. To verify Stefan's law by electrical method
6. To Study resonance in LCR circuit with a c source.
7. To determine the height of a tower with a Sextant.
8. To determine the refractive index of a liquid by Newton's ring.

Textbooks

1.	Introduction to Special theory Relativity-Robert Resnick. Wiley Eastern Ltd.
2.	Quantum Mechanics: Theory and Applications- Ajoy Ghatak. Tata McGraw-Hill
3.	Optics- N. Subrahmanyam. Brij Lal. M.N. Avadhanulu. S.Chand
4.	Fiber optics and laser Principles and Applications-Anuradha De. New Age International

Reference books

1.	Optics- Ajoy Ghatak. Tata McGraw-Hill
2.	Concepts of Modern Physics-Arthur Beiser . Tata McGraw-Hill

BAS-08 A	ENGINEERING PHYSICS-II	
Course category	:	Basic Science and Math's (BSM)
Pre-requisites	:	NIL
Contact hours/week	:	Lecture : 3. Tutorial : 1 . Practical: 2
Number of Credits	:	5
Course Assessment methods	:	Continuous assessment through tutorials. assignments. quizzes. Minor test and Major Theory & Practical Examination
Course Outcomes	:	The students are expected to be able to demonstrate the following knowledge. skills and attitudes after completing this course

1. Basics of crystallography application in Engineering
2. Use of the principles of sound wave and acoustics in civil engineering with the consideration of NDT.
3. Basic principles of electricity and magnetism applied in Engineering.
4. Maxwell's equation of electromagnetic theory and its application in engineering.
5. Basic principles of semiconducting materials and its application.

Topics Covered

UNIT-I

Crystal Structures and X-ray Diffraction

Space lattice. basis. Unit cell. Lattice parameter. Seven crystal systems and Fourteen Bravais lattices. Crystal-System Structure. Packing factor (cubic. body and face). Crystal structure of NaCl. Lattice planes and Miller Indices. Diffraction of X-rays by crystal. Laue's experiment. Bragg's Law. Bragg's spectrometer.

9

UNIT-II

Sound Waves and Acoustics

Sound waves. intensity. loudness. reflection of sound. echo: Reverberation. reverberation time. Sabine's formula. remedies over reverberation; Absorption of sound. absorbent materials; Conditions for good acoustics of a building: Noise. its effects and remedies: Ultrasonic –Production of ultrasonic by Piezo-electric and magnetostriction; Detection of ultrasonic; Engineering applications of Ultrasonic (Non-destructive testing).

9

UNIT-III

Electrodynamics –I

Basic concepts of Gauss's law. Ampere's law and faradays law of electromagnetic induction. Correction of Ampere's law by Maxwell (concept of displacement current). Maxwell's equation. transformation from integral form to differential form. physical significance of each equation

9

Electrodynamics –II

Maxwell's equation in free space. velocity of electromagnetic wave. transverse character of the wave and orthogonality of E. H and k vectors. Maxwell's equations in dielectric medium and velocity of e. m. wave. comparison with free space. Maxwell's equations in conducting media. solution of differential equation in this case and derivation of penetration depth

UNIT-IV

Physics of Advanced Materials

Semiconducting Materials: Concept of energy bands in solids, Carrier concentration and conductivity in intrinsic semiconductors and their temperature dependence, carrier concentration and conductivity in extrinsic semiconductors and their temperature dependence. Hall effect in semiconductors, Compound semiconductors, Optoelectronic Materials.

Superconducting Materials: Temperature dependence of resistivity in superconducting materials, Effect of magnetic field (Meissner effect), Temperature dependence of critical field, Type I and Type II superconductors, Electrodynamics of superconductors, BCS theory (Qualitative) and Applications of Superconductors.

Nano-Materials: Basic principle of nanoscience and technology, structure, properties and uses of Fullerene and Carbon nanotubes, Applications of nanotechnology.

9

EXPERIMENTS

1. To determine the specific resistance of a given wire using Carrey Foster's Bridge.
2. To study the variation of magnetic field along the axis of current carrying circular coil.
3. To study the Hall's effect and to determine Hall coefficient in n type Germanium.
4. To study the energy band gap of n- type Germanium using four probe method
5. To determine e/m of electron using Magnetron valve
6. To draw hysteresis curve of a given sample of ferromagnetic material
7. To determine the velocity of Ultrasonic waves
8. To determine the Elastic constants (Y, η, σ) by Searls method

Textbooks

1.	Solid State Physics - S. O. Pillai, 5 th edition, New Age International.
2.	Semiconductor Devices and Application - S.M. Sze, Wiley
3.	Introduction to Nano Technology - Poole Owens, Wiley India
4.	Master Hand book of Acoustics - F. Alton Everest and Ken Pohlmann, 5 th edition, McGraw Hill

Reference books

1.	Introduction to Solid State Physics- Kittel , 7 th edition, Wiley Eastern Ltd.
2.	Introduction to Electrodynamics- David J. Griffiths Pearson, New International Edition

BAS-09		ENGINEERING CHEMISTRY
Course category	:	Basic Sciences & Maths (BSM)
Pre-requisites	:	NIL
Contact hours/week	:	Lecture: 3, Tutorial: 1, Practical: 2
Number of Credits	:	5
Course Assessment methods	:	Continuous assessment through tutorials, assignments, quizzes, Minor test and Major Theory & Practical Examination
Course Outcomes	:	The students are expected to be able to demonstrate the following knowledge, skills and attitudes after completing this course

1. Students will acquire basic knowledge in Engineering Chemistry, which allows students to gain qualitative and quantitative skills.
2. Make good scientific observations and develop experimental method of evaluation of different systems at industrial or research level.
3. Students will develop Interdisciplinary skills which can help them to thrive in the life-long changing environment in various fields of Industry.
4. Students will acquire practical knowledge and will be able to analyse data constructively and formulate new ideas.

UNIT-I	9
Molecular orbital theory, LCAO approximation, MO diagrams of diatomic molecules. Band theory of metallic bond, Hydrogen bonding, Structure of graphite and fullerene- C_{60}. Liquid crystallite state, classification and applications of liquid crystals. Phase Rule and its application to water system.	

UNIT-II	9
Inductive, mesomeric and hyperconjugative effects, Stability of reactive intermediates, e.g. Carbocation, Carbanion and free radicals. Types of organic reactions, & Mechanism of nucleophilic substitution & elimination reactions, Mechanism of organic name reactions (Cannizzaro reaction, Aldol condensation, Beckmann rearrangement, Hoffmann rearrangement & Diels Alder Reaction) Stereosomerism of organic compounds containing one & two chiral centers. Enantiomers & diastereomers, R-S & E-Z Nomenclature. Examples of optically active compounds without chiral centre, Conformations of butane.	

UNIT-III	9
Introduction & classification of polymers, Chain and Step growth polymerization, Thermoplastic and Thermosetting resins, Elastomers and synthetic fibres, Mechanism of chain polymerization, Stereoregular polymers, Synthesis and applications of: Polyethylene, Poly propylene, PVC, PMMA, PAN, PET, Polyamides, Polyurethane, Natural and synthetic Rubbers, Phenol Formaldehyde Resin. Conducting & biodegradable polymers and their applications Classification of Fuels, calorific value of fuel, gross & net calorific value, determination of calorific value using Bomb calorimeter	

UNIT-IV	9
Basic principles of spectroscopic methods, Basic principles of UV-Visible, IR, ^{1}H NMR & Mass spectroscopy, determination of structure of simple organic compounds. Hardness of water, Softening of water (Zeolite process, Lime Soda process & Ion exchange process). Treatment of boiler feed water by Calgon process	

EXPERIMENTS

1. Determination of iron content in the given sample using $K_3[Fe(CN)_6]$ as an external indicator.
2. Determination of temporary and permanent hardness in water sample using EDTA as standard solution.

3.	Determination of alkalinity in the given water sample.
4.	Determination of chloride content in the given water sample by Mohr's method.
5.	Determination of percentage of available chlorine in bleaching powder sample.
6.	pH-metric titration between strong acid and strong base.
7.	Viscosity of a polymer like polystyrene by Viscometric method.
8.	Element detection & functional group identification in organic compounds
9.	Preparation of a polymer like Bakelite or PMMA.
10.	Preparation of Sodium Cobaltinitrite salt.

Books & References

1.	Engineering Chemistry, Wiley India
2.	Engineering Chemistry, Tata McGraw Hill
3.	Concise Inorganic Chemistry - J.D. Lee; Wiley India
4.	Organic Chemistry- Morrison & Boyd, 6th edition, Pearson Education
5.	Physical Chemistry - Gordon M. Barrow; McGraw Hill
6.	Physical Chemistry - Peter Atkins & Julio De Paula, Oxford University Press

BAS-15	APPLIED ENGINEERING CHEMISTRY	
Course category	:	Basic Sciences & Maths (BSM)
Pre-requisites	:	NIL
Contact hours/week	:	Lecture: 3, Tutorial: 1, Practical: 2
Number of Credits	:	5
Course Assessment methods	:	Continuous assessment through tutorials, assignments, quizzes, Minor test and Major Theory & Practical Examination
Course Outcomes	:	The students are expected to be able to demonstrate the following knowledge, skills and attitudes after completing this course

1. Students will acquire basic knowledge in Engineering Chemistry, which allows students to gain qualitative and quantitative skills.
2. Make good scientific observations and develop experimental method of evaluation of different systems at industrial or research level.
3. Students will develop Interdisciplinary skills which can help them to thrive in the lifelong changing environment in various fields of Industry.
4. Students will acquire practical knowledge and will be able to analyze data constructively and formulate new ideas.

UNIT-I	
Thermodynamics I: First Law of thermodynamics and internal energy, state and state functions, sign convention for heat and work, nature of work, path dependence of heat and work. Enthalpy, heat changes at constant volume and constant pressure, heat capacities (CV, CP) and their relationship for ideal gases. Change in internal energy (ΔU) and enthalpy (ΔH) of chemical reactions, relation between ΔU and ΔH. **Thermodynamics II**: Second Law of Thermodynamics, Carnot cycle, entropy, entropy changes in reversible and irreversible processes and of universe. **Electrochemistry**: Arrhenius theory of electrolytic dissociation, Hydrolysis of salts, hydrolysis constant, buffer solutions.	9

UNIT-II	
Electrochemical Cells: Reactions in reversible cells, free energy and emf of reversible cell. Single electrode potential (Nernst equation), its measurement and sign convention. Standard electrode potential. Emf of reversible cell from electrode potentials. Types of reversible electrode, reference electrodes. Applications of emf measurements. **Corrosion:** Causes of metallic corrosion, Electrochemical theory of corrosion, types of corrosion, prevention of corrosion (electrochemical and inhibitor method). **Chemical Kinetics:** Order and molecularity of chemical reactions, first order and pseudo first order reactions. Kinetic law for second order reactions, determination of the rate constant and order of reaction from kinetic data. Effect of temperature on rate of reaction, Arrheninus equation.	9

UNIT-III	
Basic concepts of organic reactions. Types of organic reactions (Addition, substitution, elimination and rearrangement reactions)	9

Electrophilic Substitution, Mechanism of nitration, halogenation, sulphonation, and Friedel-Crafts (alkylation and acylation) reactions. Effects of substituents on orientation and reactivity.

Addition reactions , Hydration, and hydroxylation reactions.

UNIT-IV	9
Coordination compounds: Nomenclature, Werner's theory, Isomerism, Sidgwick's EAN concept and Valence Bond Theory. **Theories of Metal-Ligand bonding:** Limitations of valence bond theory; Crystal-field theory and crystal-field splitting in octahedral, tetrahedral and square planar complexes. Factors affecting the crystal-field splitting.	

EXPERIMENTS

1. Determination of the coefficient of viscosity of the given unknown liquids using Viscometer and identify the given liquid.
2. Study of the distribution of iodine between water and $CHCl_3$ / butanol.
3. Determination of the specific reaction rate of the hydrolysis of methyl acetate/ethyl acetate catalyzed by hydrogen ions at room temperature.
4. Determination of the strength of NaOH solution with the help of oxalic acid.
5. Preparation of inorganic complex of copper/ nickel.
6. Preparation of polyacrylic acid by free radical polymerization.
7. Determination of the strength of ferrous ammonium sulphate using $KMnO_4$ as self indicator.
8. Determination of Surface Tension of a given liquid by Stalagamometer.
9. Preparation of iodoform from acetone.
10. Applications of TLC in the organic chemistry.
11. Element detection & functional group identification in organic compounds

Textbooks & Reference books

1. *Engineering Chemistry*, Wiley India
2. *Engineering chemistry* by Sivasankar, Tata McGraw Hill, New Delhi.
3. *Physical Chemistry*, P. C. Rakshit, 5th Edition (1988), 4th Reprint (1997), Sarat Book House, Calcutta.
4. *Physical Chemistry* by Peter Atkins & Julio De Paula; Oxford University Press
5. *Physical Chemistry*, K. J. Laidler and J. M. Meiser, 3rd Edition, Houghton Mifflin Comp., New York, International Edition (1999).
6. *Inorganic Chemistry*, J.E. Huheey, E.A. Keiter and R.L. Keiter, Pearson Education India, 2006.
7. *Concise Inorganic Chemistry* by J.D. Lee; Wiley India
8. *Guidebook to Mechanism in Organic Chemistry* by Peter Sykes, Orient Longman
9. *Organic Chemistry* by Morrison & Boyd; Pearson Education
10. *Organic Chemistry*, J. Clayden, N. Greeves, S. Warren, and E. Wothers, Oxford Univ. Press, Oxford (2001).

BAS 31	Advanced Mathematics and Statistics

Course category	:	Basic Sciences & Maths (BSM)
Pre-requisites	:	NIL
Contact hours/week	:	Lecture : 3, Tutorial : 1
Number of Credits	:	4
Course Assessment methods	:	Continuous assessment through tutorials, assignments, quizzes,Minor tests and One Major Theory Examination
Course Outcomes	:	The students are expected to be able to demonstrate the following knowledge, skills and attitudes after completing this course

1. To find the root of a curve using Bisection, Regula Falsi, Newton's Methods.
2. Use of moments and kurtosis to find the type of curve.
3. To interpolate a curve using interpolation formula.
4. Use of Fourier transforms and Z transforms to solve the differential equation.

Topics Covered

UNIT-I

Numerical Methods I: Solution of algebraic and transcendental equations by Bisection, Regula-Falsi, secant Method and Newton-Raphson methods. Newton's Gregory forward and backward interpolation, Lagrange's and Newton's divided difference method. | 9

UNIT-II

Numerical Methods II: Solution of system of linear equations by Jacobi, Guass-Siedel method and Crout's method. Trapezoidal Rule, Simpson's one-third and three-eight rules. Solution of differential equations by Taylor, Picard, Euler, Runge-Kutta Fourth Order Methods, Milne's and Adam's predictor and corrector methods. | 9

UNIT-III

Integral Transforms: Fourier integral, Complex Fourier transform, Inverse Transforms, Convolution theorem, Fourier sine and cosine transform, Applications of Fourier transform to simple one dimensional heat transfer equation, wave equation. | 9

Z- transform and its application to solve difference equations

UNIT-IV

Statistical Methods and Probability Distributions: Frequency Distributions, mean, mode, median, standard deviation, Moments, Skewness, Kurtosis, Types and measurement of Skewness and Kurtosis. Correlation; Regression and regression lines. Binomial Distribution, Poisson's Distribution, Normal Distribution. | 9

Textbooks

1.	B.S. Grewal: Higher Engineering Mathematics; Khanna Publishers.
2.	B.V. Ramana: Higher Engineering Mathematics, Tata Mc. Graw Hill Education Pvt. Ltd., New Delhi.

Reference books

1.	Numerical Methods: P.Kandasamy, K.Thilagavathi, K.Gunavathi., S. Chand & Company.
2.	N.P. Bali and Manish Goel: Engineering Mathematics; Laxmi Publications.
3.	Beri - Business Statistics (Tata Mc. Graw Hill 2nd edition).

·148

Letter No./BOS/Appl.Sc./M.M.M.U.T/ ٦ 2   /2018   Date: 30/01/2018

Dean U.G. Studies and Entrepreneurship

Please find enclosed herewith the minutes of the meeting of the BOS of Department of Applied Science held on 30.01.2018 at your end.

(Dr. D. Kandu)
HASD

BOARD OF STUDIES
DEPARTMENT OF APPLIED SCIENCE
MADAN MOHAN MALAVIYA UNIVERSITY OF TECHNOLOGY
GORAKHPUR – 273 010 (UP) INDIA

Minutes of meeting of Board of Studies of Department of Applied Science, M. M. M. University of Technology, Gorakhpur held on Dated: 30.01.2018

The following were present:

List of Member of BOS

Sr. No.	Name	Member	Signature
1.	Dr. D. Kandu	Chairman	
2.	Prof. D.K. Dwivedi	Internal Member	
3.	Prof. Arjun Dubey	Internal Member	
4.	Dr. B.K. Pandey	Internal Member	
5.	Dr. S. N. Singh	Internal Member	
6.	Dr. R. K. Yadav	Internal Member	S. U. Singh
7.	Dr. V. K. Mishra	Internal Member	Absent
8.	Dr. P.P. Pande	Internal Member	PPande
9.	Dr. S.P. Singh	Internal Member	
10.	Dr. A.K. Barnwal	Internal Member	Amit
11.	Dr. Harish Chandra	Internal Member	
12.	Shri. Ravi Kr. Gupta	Internal Member	
13.	Dr. Krishna Kumar	Internal Member	
14.	Dr. Abhijit Mishra	Internal Member	Abhijit Mishra
15.	Dr. Abhishek Gupta	Internal Member	
16.	Dr. Ram Keval	Internal Member	
17.	Dr. G. Anantharaman	Department of Chemistry, IIT Kanpur, Kanpur	
18.	Prof. A. K. Singh	Department of Physics, BHU, Varanasi	

The following decisions were taken:

1. The list of examiners for Theory & Practical Examination of Physics, Chemistry, Mathematics, and Humanities for even semester Session 2017-18 was prepared.
2. The syllabus of M.Sc. Physics with specialization in electronics was recommended to be effective from the academic session 2018-19.
3. The syllabus of human values and professional ethics (BAS-11) is revised to be effective from the academic session 2018-19.
4. Panel of examiners for comprehensive examination of Ph.D. students admitted in the academic session 2017-18 was recommended.

The meeting ended with thanks to the chairman.

(Dr. D Kandu)
HASD

Copy to:-
1. Dean P.G. Studies and R. & D.
2. Dean U.G. Studies and Entrepreneurship

(Dr. D Kandu)
HASD