UNIVERSITY OF JAMMU

NOTIFICATION
(11/Aug/ ADP/28)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Academic Council, has been pleased to authorize adoption of the revised Syllabi and Courses of Study in the subject of Electronics for Part-II of Three Year B.Sc. (General) Course and III & IV semesters of Master's Degree Programme in Electronics (given in annexure) for the examination to be held in the years as under alongwith %age of change:-

Adoption of the revised Syllabi of B.Sc. Part-II & M.Sc. III & IV semesters

B.Sc-II

S.No.	Paper	Title of Paper	For the examinations to be held in the year	%age of change
1.	A	Electronics Instrumentation	2012 only	20%
2.	B	Digital Electronics	2012 only	No change
3.		Practical	2012,2013,2014	No change

M.Sc. Semester-III

S.No.	Course No.	Title of Paper	For the examinations to be held in the year	%age of change
1.	505	Electronics Measurement and Instrumentation(EMI)	Dec. 2011, 2012, 2013	10%
2.	508	Electronic Communication Systems-I(ECS-1)	Dec. 2011, 2012, 2013	10%
3.	509	Device & Circuit Simulation(DCS)	Dec. 2011, 2012, 2013	10%
4.	510	Industrial Electronics	Dec. 2011, 2012, 2013	10%
5.	519	Lab. Course in Power Electronics & Simulation	Dec. 2011, 2012, 2013	10%
6.	520	Lab. Course in Electronic Instrumentation and Communication	Dec. 2011, 2012, 2013	10%

M.Sc. Semester-IV

S.No.	Course No.	Title of Paper	For the examinations to be held in the year	%age of change
1.	555	Digital Signal Processing(DSP)	May 2012,2013,2014	10%
2.	556	Electronic Communication Systems-II(ECS-II)	May 2012,2013,2014	10%
3.	557	IC Technology(ICT)	May 2012,2013,2014	10%
4.	565	Lab. Course in Digital Signal Processing	May 2012,2013,2014	10%
5.	571	Industrial Training & Project Work	May 2012,2013,2014	10%

The alternative question papers are required to be set as per the University regulation given as under:-

i). **If the change in the Syllabi and Courses of Study is less than 25%, no alternative question papers be set.**

ii). **if the change is 25% and above but below 50% alternative question paper be set for one year.**

iii). **If the change is 50% and above or whole scheme is changed, alternative question papers be set for two years.**

Sd/-
REGISTRAR

F.Acd./28/11/ 5131-60
Dated: 25-08-2011

Copy for information and necessary action to:

1. Special Secretary to Vice-Chancellor, University of Jammu.
2. P.S. to Dean Academic Affairs
3. Sr. P.A. to Registrar/ Controller of Examinations;
4. Dean, Faculty of Sciences
5. Convener, Board of Studies in Electronics/Head, P.G. Department of Physics & Electronics
6. Members of the Board of Studies concerned
7. Principals of all the affiliated Colleges
8. C.A. to Controller of Examinations.
9. I/c Deputy (Exams. U/G/P/G /Pub.);
10. A.R. (Conf./PRI/Admissions);
11. S.O (Confidential)
12. Content Manager, University Website.

Asst. Registrar (Academics)
23/8/11

DETAILED SYLLABUS

B. Sc. Part-II

Subject: Electronics
Paper: A
Title: *Electronic Instrumentation*
Validity: Examinations to be held in 2012

Duration of Examination: 3 Hrs
Max. Marks: 40

Unit-I: Electronic Instrument

Basic PMMC movement; AC voltmeter using rectifiers; RMS responding voltmeter; Electronic multimeter; Differential voltmeter; Digital voltmeter; Ramp type; Successive approximation; Continuous balance; Q-meter; RF Power meter and Voltage measurement.

Unit-II: Oscilloscopes

Oscilloscopes: Block Diagram ; CR tube; Electrostatic Deflection; CRT Screen ;CRT circuits; Vertical deflection system; Horizontal deflection system; Delay line; Oscilloscope probes; Oscilloscope techniques; Measurement of frequency, Phase angle and Time delays; Sampling Oscilloscope; Storage Oscilloscopes.

Unit-III: Transducers

Classification: Capacitive and Inductive transducers; Variable differential transformers, Oscillation transducers; Strain Gauge; Resistance thermometers; Thermocouple; Thermistors; Photoelectric and Piezoelectric transducers; Potentiometer and Velocity transducers ; Photosensitive devices ; Photoconductive and Photovoltaic cells.

Unit -IV: Operational Amplifier

Ideal Op-AMP properties; Configurations; Inverting and Non-inverting; Differential and common mode; Parameters: input offset; input bias current; input offset current; slew rate and common mode rejection ratio; Op-Amp applications; Differentiator and Integrator; Voltage to current converter and Current to Voltage converter and Op-Amp square and triangular wave generators.

Unit-V: Special Purpose ICs

Phase Locked Loop (PLL) and Voltage controlled oscillators (VCO's); PLL frequency synthesise; radiation detector; Charged couple devices (CCD's); Waveform generators; Timer 555 as astable, Mono-stable and Bistable multivibrator and Op-Amp square and Triangular wave generators.

Note for paper setter

The question paper will contain two questions from each unit, and the candidates will be required to answer one question from each unit. The numerical component in the paper shall not exceed 40% of the total marks.

Books for Study and Reference

1. Electronic Instrumentation and Measurement Techniques - W.D.Cooper & A.D. Helfrick, Prentice Hall of India.
2. A course in Electrical and Electronic Measurements and Instrumentation - A.K. Sawhney, Dhanpat Rai and Sons.
3. Operational Amplifier : Ramakant Gayakwad, Linear Integrated Circuits : D. Roy Choudhary & Shail B. Jain.
4. Electronic Devices and Circuit theory: Robert L Boylsted & Louis Nashlesky.

DETAILED SYLLABUS

B. Sc. Part-II

Subject: Electronics
Paper: B
Title: *Digital Electronics*
Validity: Examinations to be held in 2012, [redacted]

Duration of Examination: 3 Hrs
Max. Marks: 40

UNIT I. *Logic Circuits*
Logic gates; number systems and their conversions: binary, octal, decimal, and hexadecimal; binary arithmetic: compliment, addition, subtraction, multiplication, and division; binary codes: 8421, BCD, Excess-3, Gray, and ASCII; digital logic families: RTL, DTL, TTL (open collector, totem pole, Schotky, tristate gate), and CMOS (basic logic and transmission gates).

UNIT II *Combinational logic*
Boolean algebra: basic definitions, axioms, functions, and simplifications; conversion between canonical forms; minimization and realization techniques: K-maps (4 variables) and ~~MQ~~ QM method (with exercises); half and full adders; subtractors, parity checkers; magnitude comparators; decoders and encoders.

UNIT III *Sequential logic*
Flip flops: RS, D, JK, JK Master-slave, and T; counters: ripple, BCD, and binary; synchronous: binary up down, BCD parallel loading, timing sequences, ring, and Johnson counter.

UNIT IV *Memories*
Registers: serial-in-serial out, serial-in-parallel out, parallel-in-serial out, and parallel-in-parallel out; shift registers: unidirectional and bidirectional; serial addition; ROM: PROM, EPROM, and EEPROM; RAM: static and dynamic.

UNIT V *A/D and D/A converters*
DAC's specifications; DAC's types: binary weighted resistor, R-2R ladder; ADC's specifications; ADC's types: successive approximation, simultaneous A/D conversion, counter method, continuous A/D conversion, and dual slope method.

Note for paper setter
The question paper will contain two questions from each unit, and the candidates will be required to answer one question from each unit. The numerical component in the paper shall not exceed 40% of the total marks.

References

1. Thomas L. Floyd, **Digital Fundamentals**, Universal Book Stall, New Delhi.
2. Malvino and Leach, **Digital Principles and Applications**, Tata McGraw-Hill, New Delhi.
3. M. Moris Mano, **Digital Logic Design**, Prentice-Hall of India, New Delhi.

DETAILED SYLLABUS

B. Sc. Part-II

Subject: Electronics
Title: Practicals
Validity: Examinations to be held in 2012, 2013, and 2014
Duration of Examination: 6 Hrs (consisting of 2 sessions each of 3 hours spread over two days)

Max. Marks: 50
External Exam: 25
Internal Assessment: 25

Each of the students has to perform a minimum of 12 experiments selecting atleast one experiment from each of the following topics:

Set I: Logic Gates

Set II: Combinational Circuits

Set III: Sequential Circuits

Set IV: Voltage, Current, Power, and Frequency Measurements

Set V: Transducers

Set VI: Operational Amplifiers

DETAILED SYLLABUS

M. Sc. ELECTRONICS 3rd SEMESTER

Course No: 505
Title: *Electronic Measurement & Instrumentation* (EMI)
Credits: 4
Validity: 2011, 2012 and 2013 December exams

Duration of Examjnation: 3 Hrs
Max. Marks: 100
Semester Exam: 80
Sessional Assessment: 20

UNIT I. *Basic concepts*

Transducers: pressure transducers, temperature measurement, pulse sensors, techometers, displacement, flow, humidity, thickness, pH, position; medical measurement constraints; interfering and modifying inputs; compensation techniques; electrical activity of excitable cells; electrode-electrode interface; plolarization; electrode-skin interface and motion artifact.

UNIT II. *Biopotential amplifiers*

Basic requirements; electrocardiograph: functional diagram, problems, transient protection; interference reduction circuits; amplifiers for other biopotential signals: EMG and EEG amplifiers, amplifiers for use with glass micropipet intracellular electrodes; example of biopotential preamplifier; cardiotachometers; electromyogram integrators; evoked potential and signal averagers; fetal electrocardiography; vectorcardiograph; cardiac monitors; biotelemetry.

UNIT III. *Blood pressure measurements*

Direct and indirect measurements; dynamic properties of pressure-measurement systems; system response: measurement, effects of system parameters, bandwidth requirement; typical pressure-waveform distortion; systems for measuring venous pressure; heat sounds: origin and mechanism, auscultation techniques, stethoscopes; phonocardiography; cardiac catheterization; effects of potential and kinetic energy on pressure measurement; tonometry.

UNIT IV. *Medical imaging systems and safety*

Photography; radiography; computer radiography; computer tomography; magnetic resonance imaging; nuclear medicine; single-photon emission computed tomography; positron emission tomography; ultrasonography; physiological effects of electricity; susceptibility parameters; distribution of electric power; macroshock and microshock hazards; protection by power distribution and equipment design.

UNIT V. *Patient monitoring systems*

Introduction to: ENG, EMG, ERG, EEG, MEG; apnoea detectors; foetal monitoring: heat rate, labour activity; computerized ECG and catherisation laboratory; transmission of physiological signals over telephone lines; short wave and microwave diathermy machines.

Note for examiner:

There shall be 10 questions in the question paper with two questions from each unit. The students are required to answer five questions attempting one question from each unit.

References:

1. John G. Webster, **Medical instrumentation: application and design**, John Wiley & Sons, Inc, New York.
2. R. S. Khandpur, **Handbook of biomedical instrumentation**, Tata McGraw-Hill Publishing Company Limited., New Delhi.

DETAILED SYLLABUS

M. Sc. ELECTRONICS 3rd SEMESTER

Course No: 508
Title: ***Electronic Communication Systems-I*** (ECS-I)
Credits: 4
Validity: 2011, 2012 and 2013 December Exams

Duration of Examination: 3 Hrs
Max. Marks: 100
Semester Exam: 80
Sessional Assessment: 20

UNIT I. *Spectral Analysis*
Signal: Properties & Classification: Signal energy and power, Singularity functions: Step, Impulse & Ramp, Signal operations: Shifting, Inversion and Scaling, Review of Fourier series, Fourier transform and its properties; FT of periodic signals; Convolution; Parseval's theorem for Energy Signals, Energy Spectral Density, Parseval's theorem for Power Signals, Power Spectral Density, Power spectral density of modulated signals; Response of LTI system; Power density spectrum of input and response; Correlation of energy signals; Autocorrelation and its properties; Autocorrelation function of periodic and non periodic signals.

UNIT II. *Random Processes and Noise*
Review of probability theory: Random variables, Probability density function; Random processes: Definition, Mean, correlation & covariance; Classification: Stationary, Non-Stationary, Wide sense stationary and Ergodic processes; Gaussian process; Transmission of random processes through linear filters; Power spectral density; Cross-correlation function and Cross power density;
Noise: Origin and Classification; Thermal noise; Noise calculations: Single & Multiple sources, Noise Figure, Noise temperature; Power spectral density of noise; White noise; Equivalent noise BW; Available power density; Noise in reactive circuits.

UNIT III. *Analog Modulation*
AM and its spectrum, generation by square law modulation; AM demodulation by square law demodulator and envelope detector; DSBSC: Spectrum, Generation (Balanced modulator) Detection (Synchronous detection); SSB modulation; Generation by frequency discriminator & phase discriminator methods and Synchronous detection; VSB: Generation, Detection.
Angle modulation: Phase and FM; NBFM; WBFM; Generation of FM by Direct and Indirect method, FM discriminator.

UNIT IV. *Digital Modulation*
Sampling Theorem, Sampling techniques: Natural and Flat-top sampling; PAM & PTM, PCM: Quantization and BW; Companding; Differential PCM; Delta modulation; Adaptive delta modulation; Shift keying: ASK, FSK, PSK, DPSK, QPSK and MSK with generation and reception.

UNIT V. *Information Theory*
Information measure; Average information (Entropy); Information rate; Discrete memory less channel, Channel types; Joint and Conditional entropy; Mutual information; Channel capacity; Shannon's Theorem; Shannon-Hartley Theorem; Trade-off between S/N and BW; Source coding; Entropy coding.

Note for paper setter:
There shall be 10 questions in the question paper with two questions from each unit. The students are required to answer five questions attempting one question from each unit.

'ences:

rinciples of Communication Systems, H. Taub, D. L. Schilling and G. Saha, Tata McGraw-Hill.

odern Digital and analog Communication Systems, B. P. Lathi, Oxford University Press.

)mmunication Systems, Simon Haykin, John Wiley and Sons.

ieory and Problems of Analog and Digital Communications, Hwei P. Hsu, Schaum's Outline ries, McGraw-Hill.

mmunication Systems, R.P. Singh and S.D. Sapre, Tata McGraw-Hill.

Introduction to the Principles of Communication Theory, J. C. Hencock, Tata McGraw-Hill.

mmunication Systems, A. B. Carlson, P. B. Crilly and J. C. Rutledge, McGraw-Hill.

)rmation, modulation, and noise, Schwartz, McGraw-Hill.

DETAILED SYLLABUS

M. Sc. ELECTRONICS 3rd SEMESTER

509
e & Circuit Simulation (DCS)

)11, 2012, and 2013 December exams

Duration of Examination: 3 Hrs
Max. Marks: 100
Semester Exam: 80
Sessional Assessment: 20

MOSFET Structure and operation
Overview of MOSFET modeling ; MOSFET structure and operation, MOSFET characteristics : effect of substrate bias, punchthrough, MOSFET capacitances, small signal behaviour, device speed, MOSFET scaling ; Hot carrier effects ; Gate material, Nonuniform channel doping ; Source-Drain structures ; device isolation.

Device simulation
Introduction; physical description; basic equations; carrier statistics; mobility models; boundary conditions; discretization and solutions methods; grid specifications; rectangular mesh; regrid algorithm; PISCES input specifications; device simulation examples: MOSFET and diode.

Circuit simulation-I
Spice and its types, limitations; Circuit Descriptions: Input files, Element values, Nodes, Circuit elements, Sources, Types of analysis and output variables; Format of circuit and output files; DC Circuit Analysis: Modeling of elements, Operating temperature, Dependent and independent sources, DC output variables, Types of output, Types of dc analysis; Transient analysis: Capacitors and Inductors, Transient sources and Modeling, Transient output variables and commands, Transient response.

Circuit simulation-II
AC circuit analysis: AC output variables, Independent ac sources, AC analysis. Advanced Spice Commands and Analysis: Behavioral modeling, Subcircuit, Function, Global, Include file, Library file, Nodeset, Options, Parameter, Fourier, Noise, Sensitivity, Parametric and Monte carlo analysis; Modeling, characteristics and simulation analysis of semiconductor diodes, bipolar junction transistors.

Hardware design language
Overview: evolution, emergence of HDL's; design flow and importance; Hierarchical modeling concepts: methodologies, modules, instances and components; Basic concepts: lexical convention; specification of numbers; strings and data types; compiler directives; Modules and Ports: modules, ports, hierarchical names; Gate-level modeling: gate types, gate delays, Data flow modeling: Continuous assignments, delays, Expressions, operators and operands, operators types.

Note for Paper Setter:
There shall be 10 questions in the question paper with two questions from each unit. The students are required to answer five questions attempting one question from each unit.

ferences:

N. Arora, **MOSFET Models for VLSI circuit Simulation,** Theory and Practice, Springer-Verlag, New-York

M R Pinto, C S Rafferty & R W Dutton, **PISCES-II User's Manual,** (Stanford Electronics Labs, Stanford Univ CA) 1984.

Muhammad H. Rashid, **Introduction to PSpice using OrCAD for Circuits and Electronics**, Third Edition, Pearson Education, New Delhi.

Samir Palnitkar, **Verilog HDL**, Pearson Education Asia, Delhi.

DETAILED SYLLABUS

M. Sc. ELECTRONICS 3rd SEMESTER

rse No: 510
:: *Industrial Electronics*
lits: 4
dity: 2011, 2012, and 2013 December exams

Duration of Examination: 3 Hrs
Max. Marks: 100
Semester Exam: 80
Sessional Assessment: 20

T I. *Introduction to Control System*

Introduction to linear control system. Open loop and closed loop system. concept of feedback. modeling of physical system. application and solution of differential equation, transfer function, block diagram representation of control system & signal flow graph; Mason's gain formula; block diagram reduction using direct technique & signal flow graph. definition of poles. zeros. order. type; control action: proportional control. derivative control. integral control. PID controller.

T II. *Transients & State Response Analysis*

Analysis of continuous time system: time domain solution of first order system, time constant. time domain analysis of second order system, determination of response for standard input using transfer function, steady state error, concept of stability: Routh-Hurwitz techniques. Construction of Bode diagram, phase margin, gain margin, construction of root locus, polar plots.

T III. *Semiconductor Power Devices*

Characteristics of power diodes. types of power diodes, power transistors, power MOSFETs, TRIAC and firing circuits. IGBT; Diode circuits and rectifiers: Diode circuit with dc source, Freewheeling Diodes. Thyristors: Characteristics of thyristors, switching characteristics of thyristors. thyristor gate characteristics, two transistor model of thyristor. thyristor rating. thyristor protection, series and parallel operation of thyristor; introduction: PUT. SCS. SUS. GTO.

T IV. *Converters & Inverters*

Phase controlled rectifier :principle of phase controlled rectifier, single-phase full wave mid-point converters, single-phase full-wave bridge converters, single phase semiconverters, dual converters: choppers: principles of chopper operation. step-up chopper. types of chopper (A,B.C.D.E.F); inverters: operation principle. voltage controlled in single phase inverter. pulse width modulated inverters; principles of cycloconverter operation.

T V. *Power Electronics applications*

SMPS (Switched Mode Power Supply), UPS (uninterruptible Power Supply), static-switches. static circuit breakers, solid state relay. concept of electric drives. Single phase DC drives, HVDC (High voltage dc transmission): types of HVDC links. bipolar HVDC system, control of HVDC converter.

for examiner:

? shall be 10 questions in the question paper with two questions from each unit. The students are red to answer five questions attempting one question from each unit.

rences:

LINEAR CONTROL SYSTEM (Prof. B. S. Manke).

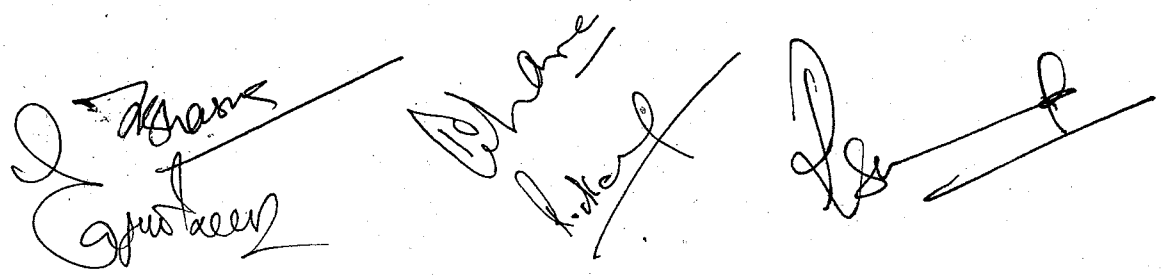
POWER ELECTRONIC (Dr.P.C.SEN)

MODERN CONTROL SYSTEM (OGATA K)

PRENTICE_HALL OF INDIA PRIVATE LIMITED

INDUSTRIAL SOLID STATE ELECTRONICS (TIMOTHY J)

POWER ELECTRONICS (Dr. P. S. BIMBHRA) KHANNA PUBLICATIONS



DETAILED SYLLABUS

M. Sc. ELECTRONICS 3rd SEMESTER

No: 519 (Lab 5)
ab course in Power Electronics & Simulation
4
': 2011, 2012, and 2013 December exams

Max. Marks: 100
Semester Exam: 50
Sessional Assessment: 50

ɔn of Examination: 6 Hrs

the students has to perform at least two experiments from each of the following sets with a minimum :periments in total.

haracteristics and applications (SCR, DIAC, TRIAC, UJT)

AC / DC drives.

Device simulation.

Circuit simulation/VHDL.

ces:

ammad H. Rashid, **Spice for circuits and electronics using PSPICE**, Prentice-Hall of India Private ted, New Delhi.

. Pinto, C S Rafferty & R W Dutton, **PISCES-II User's Manual,** (Stanford Electronics Labs, ford Univ CA) 1984.

Gupta, **A course in electrical power**, S. K. Kataria and Sons, New Delhi.

. Bhatacharya and S. Chatterjee, **Industrial electronics and controls**, Tata McGraw Hill, New i.

ammad H. Rashid, **Power electronics circuits, devices, and applications**, Prentice-Hall of India, Delhi.

DETAILED SYLLABUS

M. Sc. ELECTRONICS 3rd SEMESTER

urse No: 520
le: Lab course in *Electronic Instrumentation & communication*
edits: 4
lidity: 2011, 2012, and 2013 December exams

Max. Marks: 100
Semester Exam: 50
Sessional Assessment: 50

uration of Examination: 6 Hrs

ch of the students has to perform at least two experiments from each of the following four sets.

t I: Measurement of Electrical quantities.

t II: Measurement of non-electrical quantities.

t III: Analog/digital communication.

t IV: Biomedical measurements.

eferences:

A. K. Sawhney, **A course in electrical and electronics measurements and instrumentation**, Dhanpat Rai & Co., New Delhi.

DETAILED SYLLABUS

M. Sc. ELECTRONICS 4th SEMESTER

rse No: 555
e: *Digital Signal Processing* (DSP)
dits: 4
dity: 2012, 2013, and 2014 ~~June~~ May exams

Duration of Examination: 3 Hrs
Max. Marks: 100
Semester Exam: 80
Sessional Assessment: 20

IT I. *Discrete time signals and systems*

Advantages of digital over analog signal processing; discrete time signals and sequences: representation of sequences and elementary operations; classifications of discrete time systems; resolution of discrete time signals into impulses; analysis of discrete time LTI systems: response to arbitrary inputs, convolution sum, properties of LTI systems and their interconnections, causality and stability; linear constant coefficient difference equations and their solutions; impulse response of LTI recursive system; response to complex exponential and sinusoidal signals-the frequency response function; random signals and their statistical properties.

IT II. *Transform analysis of LTI systems*

Analysis of LTI system in the Z-domain; sampling of continuous time signals; frequency domain representation of sampling; reconstruction of a band limited signal from its samples; decimation and interpolation; system function: poles and zeros, rational system function, causality and stability; frequency response of LTI systems: phase distortion and delay; frequency response for rational system function for single zero or pole systems.

T III. *Structures for discrete time systems*

Block diagram representation of linear constant coefficient difference equations: their interconnection schemes, direct form I, direct form II, cascade form and parallel form structures; finite word length effect: number representation, analysis of coefficient quantization and rounding of noise; zero input limits cycles in fixed point realization of IIR digital filters.

T IV. *Filters design techniques*

Characteristics of practical frequency selective filter; design of FIR filters by windowing; characteristics of Butterwoth and Chebyshev filters; design of IIR filters from continuous time filters: impulse invariance and bilinear transformations methods, frequency domain sampling; DFT and its properties; circular convolution; linear convolution using DFT; FFT algorithms: decimation in time and decimation in frequency.

T V. *Application of DSP*

Dual-tone multifrequency signal detection; spectral analysis of sinusoidal signals: spectral analysis of nonstationary signals; spectral analysis of random signals; musical sound processing; digital musical synthesis; signal compression; transmultiplexers; discrete multitone transmission of digital data: oversampling A/D converters; oversampling D/A converters; sparse antenna array design.

e for examiner:

e shall be 10 questions in the question paper with two questions from each unit. The students are ired to answer five questions attempting one question from each unit.

erences:

Andrew Bateman and Warren Yates. **Digital signal processing design.** A. H. Wheeler & Co. Limited. Great Britain.
ohnny R. Johnson. **Introduction to digital signal processing.** Prentice-Hall of India Private Limited. New Delhi.
Richard G. Lyons. **Understanding digital signal processing.** Pearson education Asia. India.
Alan V. Oppenheim. **Discrete signal processing.** Prentice-Hall of India Private Limited. New Delhi.
Sanjit K. Mitra. **Digital signal processing: a computer based approach.** Tata McGraw-Hill. New Delhi.
Andreas Antoniou. **Digital filters analysis and design.** Tata McGraw-Hill Publishing Company Limited. New Delhi.
Simon Haykins. **Adaptive filter theory.** Pearson education Asia. India.
Raghuveer M. Rao and Ajit S. Bopardikar. **Wavelet transforms: introduction to theory and applications.** Pearson ducation Asia. India.

ILED SYLLABUS

ELECTRONICS 4th SEMESTER

No: 556
ectronic Communication Systems-II (ECS-II)
4
: 2012, 2013, and 2014 May Exams

Duration of Examination: 3 Hrs
Max. Marks: 100
Semester Exam: 80
Sessional Assessment: 20

Television
Television fundamentals: scanning, blanking, synchronization, composite video signal, signal transmission, channel bandwidth, and standards; B/W television: block diagram of TV receiver, vidicon TV camera, monochrome picture tube; Color TV: primary color and their mixing, transmission primaries, colour synchronization, PAL encoder and decoder, trintron picture tube.

I. *Satellite communication*
Introduction, satellite frequency bands, satellite system; satellite orbits: inclined, polar and equatorial, geostationary satellite; satellite channel: electromagnetic field propagation, transmission path and path loss, saturation flux density, satellite Link analysis; satellite earth station, satellite transponder, multiple access format, TDMA, FDMA, CDMA, Mobile Telephone Networks (brief).

II. *Radar*
Radar fundamentals: block diagram, radar range equation, performance factor, detection of signal in noise, false alarm and miss moving target; Doppler effect, MTI and pulse Doppler radar, continuous wave radar, FMCW radar, tracking wave radar, radar clutters, radar beacon, ILS

V. *Optical communication* -I
Introduction to optical fibers, comparison with conventional communication media, construction of optical fiber cable, propagation in fibers, Step Index, Graded Index, Multipath dispersion, Material dispersion, combined effect, comparison of wave guiding action of both, expression for angle of acceptance and cone of acceptance, numerical aperture, time, dispersion,Types of fibers, attenuation in fibers, splices and connector, optical fiber communication systems (analog and digital), lunching light into fibers, opto-electronics Ics.

V. *Optical communication* -II
Optical transmitter/receiver circuits, driver circuit for LED, detector circuit design using photodiode, photo transistor and fibers choice, techniques for modifying spectral response, factors limiting performance of integrated detectors, p-i-n photodiode detectors and Avalanche photodiode detector for optical communication applications, Opto-couplers, transmission/receiver communication special fibers- DS fiber, NZ DS-fiber.

examiner:
There shall be 10 questions in the question paper with two questions from each unit. The students are required to answer five questions attempting one question from each unit.

us: Electronic Communication Systems-II, Dept of Physics and Electronics, University of Jammu

rences:

1. Optoelectronics-an introduction by J. Willson, JFB Hawkes
2. Integrated optics: theory and technology (3rd edition) by R. G. Hungperger
3. Optoelectronics by Keiser, TMH
4. Optical fiber communication by J. M. Sentor, PHI
5. Andrew S. Tanenbaum, Computer networks, Prentice Hall of India Limited, New Delhi.
6. Sudhir K. Pandey, Handbook of satellite communication, Authors Press, New Delhi.
7. Tri T. Ha, Digital satellite communications, McGraw-Hill Publishing Company, New York.
8. John Gowar, Optical communication systems, Prentice-Hall of India Limited, New Delhi.

DETAILED SYLLABUS

M. Sc. ELECTRONICS 4th SEMESTER

No: 557
C Technology (ICT)
s: 4
y: 2012, 2013, and 2014 ~~June~~ May exams

Duration of Examination: 3 Hrs
Max. Marks: 100
Semester Exam: 80
Sessional Assessment: 20

I. *Crystal growth and epitaxy*
Introduction: EGS, Crystal structure and defects, mono and polycrystals; Polysilicon prepration; Single crystal growth: czochralski method, float zone method, bridgeman technique; ingot shaping, polishing, cutting; epitaxy: VPE (reaction kinetics, basic transport process, doping & autodoping); LPE (liquid boat arrangement); MBE; defects in epitaxial layers.

II. *Impurity doping*
Diffusion: interstitial diffusion, substitutional diffusion, interstitial substitutional diffusion; fick laws of diffusion(Ist and 2nd); diffusion profiles: constant surface concentration diffusion, constant total dopant diffusion; extrinsic diffusion; ion implantation: penetration range, nuclear stopping, electronic stopping, implantation damage, annealing: Furnace annealing, rapid thermal annealing.

T III. *Oxidation and film deposition*
Thermal oxidation; kinetics of growth; intrinsic silica glass; extrinsic silica glass; oxide properties: masking, oxide charges, oxide stress; methods of oxidation: dry oxidation, wet oxidation, plasma oxidation; film deposition methods: CVD, vacuum evaporation, sputtering(RF and diode); different types of deposited films: films for protection, films for doping, films for masking, films for interconnections, films for ohmic and schottky contacts.

T IV. *Lithography and etching*
Lithography process: masks, transfer process, resist; optical lithography e-beam lithography, etching: resists used in various lithographic etching, wet chemical etching, dry etching; etching of non crystalline films, ion beam etching; sputter etching.

T V. *Integrated devices*
Bipolar technology: basic fabrication process, dielectric isolation, self aligned double polysilicon bipolar structure; MOSFET technology: basic fabrication process, Memory devices, CMOS technology; MESFET technology; Bonding and packaging of ICs .

te for examiner:
ere shall be 10 questions in the question paper with two questions from each unit. The students are quired to answer five questions attempting one question from each unit.

DETAILED SYLLABUS

M. Sc. ELECTRONICS 4th SEMESTER

e No: 565
Lab course in *Digital Signal Processing*
s: 4
ty: 2012, 2013, and 2014 J[redacted]e exams

Max. Marks: 100
Semester Exam: 50
Sessional Assessment: 50

ion of Examination: 6 Hrs

of the students has to perform at least two experiments from each of the following four sets.

Microcontroller programming.

: DSP programming.

I: Filter design: FIR, IIR, and Comb.

I: Signal processing: speech, video, and environmental.

ences:

ndrew Bateman and Warren Yates, **Digital signal processing design**, A. H. Wheeler & Co. Limited, reat Britain.

hnny R. Johnson, **Introduction to digital signal processing**, Prentice-Hall of India Private Limited, ew Delhi.

ichard G. Lyons, **Understanding digital signal processing**, Pearson education Asia, India.

lan V. Oppenheim, **Discrete signal processing**, Prentice-Hall of India Private Limited, New Delhi.

anjit K. Mitra, **Digital signal processing: a computer based approach**, Tata McGraw-Hill Publishing ompany Limited, New Delhi.

ndreas Antoniou, **Digital filters analysis and design**, Tata McGraw-Hill Publishing Company imited, New Delhi.

. K. Jain, **Fundamentals of digital image processing**, Prentice-Hall of India Private Limited, New elhi.

ferences:

S. M. Sze, **Semiconductor devices, Physics and technology**, John Wiley & Sons.

S. M. Sze, VLSI Technology, McGraw-Hill International.

Sorab K. Ghandhi, **VLSI fabrication principles**, John Wiley & Sons.

DETAILED SYLLABUS

M. Sc. ELECTRONICS 4th SEMESTER

Course No: 571
Title: *Industrial Training & Project Work*
Credits: 8
Validity: 2012, 2013, and 2014 [redacted] exams

Max. Marks: 200
Semester Exam: 100
Sessional Assessment:100

Duration of Examination: 6 Hrs

Objectives

This course aims at building the students for taking up industrial problems and incorporates better practical skills in them, so that they can have better exposure in the relevant field and have interaction with the industries.

Scheme

The students are required to undertake a project work and industrial training under the supervision of a faculty member from the department. The allocation of project along with the supervisor shall be done at the end of 2nd semester. This shall also include an industrial training to be undertaken by each student at an institute/industry of repute for duration of 4 to 6 weeks including the summer vacations falling between 2nd and 3rd semester. The certificate of the successful completion of industrial training of the required duration shall be submitted to the department by the candidate.

The internal assessment shall be as per the following details:

Regularity/Attendance	**Test/Seminar**	**Project work**
25 marks	25 marks	50 marks