

**Board of
Electronics Engineering
Seminar**

“ECE Board Seminar”

Scope of Presentation:

- n 1. Licensure Process at PRC**
- n 2. Preparation of Test Questions**
- n 3. Conduct of Examination**
- n 4. Correction and Release of Results**
- n 5. Scope of Examination**
- n 6. Examination Schedule**

A. Licensure Process

A.1 Qualification of Applicant

- n 1. At least 18 years of age**
- n 2. Filipino citizen or a
foreigner (with reciprocity
agreement)**
- n 3. Good Moral Character**
- n 4. Holder of ECE Degree or
equivalent**

A. Licensure Process at PRC

A.2 Filing of Applications

- 1. At least 20 days before exam for Main Office & 10 days for Regional Office**
- 2. Comply with the Computerized Appl'n Form (Follow instruction in filling up)**
- 3. Submit Appl'n Form with the ff. docs:**
 - 3.1 Original and Copy of Transcript of Records.**
 - with Special Order**
 - Date of Graduation**

A. Licensure Process at PRC

A.3 Conduct in Examination Site

- 1. Tardiness should not exceed 30 minutes**
- 2. Present Notice of Admission**
- 3. Unnecessary marks to identify the examinee is not allowed**
- 4. Verbal and sign communication is not allowed**
- 5. Bringing out examination questions and answer sheets is not allowed.**

B. Preparation of Test Questions

1. Composition of Subject

- 1. Mathematics**
- 2. Electronics Engineering**
- 3. Electronics Systems & Technologies**
- 4. General Engineering & Applied Sciences**

B. Preparation of Test Questions

2. Formulation and Encoding of Questions

- 1. Compliance to Syllabi (Books, Publication, Laws/Regulatory materials)**
- 2. Encoding by PRC or Board member**
- 3. Compliance to minimum number of questions**
- 4. PRC format, software, security (encryption, pass words)**

B. Preparation of Test Questions

3. Merging and Extraction

- 1. PRC and Board supervision**
- 2. PRC format, procedure and security (place, software, encryption, pass words)**
- 3. Compliance to PRC schedule of merging.**

C. Conduct of Examination

- 1. Examiner is confined in the Confidential Room during the printing of the questionnaires and duration of examination**
- 2. Extracted questions are printed in the Confidential Room just before the examination; watched by NBI, PRC Personnel and Board Member.**

C. Conduct of Examination

- 3. Examination questions are released in secured boxes normally to reach the examination centers 10 minutes before the scheduled examination.**
- 4. After examination, Examination Division account, pack and seal examination materials for immediate transfer to Rating Division.**

D. Correction and Release of Results

1. Reading of Answer Sheets by subjects.

- 1. By computer, Optical Scanner.**
- 2. Zero human intervention.**
- 3. Accurate.**
- 4. PRC Supervision, procedure and security (place, software, personnel).**

D. Correction and Release of Results

2. Computer corrections by subject.

- 1. Totally machine activity**
- 2. Accurate**
- 3. PRC supervision, procedure, software, personnel.**
- 4. Initial result of correction**
 - no name**
 - only the data on the answers, scores on individual questions and the median are generated**

D. Correction & Release of Results

3. Consolidation of results of all subjects.

1. Percentage weight

- Math 20%**
- Electronics Engineering 30 %**
- Electronics Systems & Technologies 30%**
- General Engineering & Applied Sciences 20%**

2. Ratings

To pass the licensure examination, a candidate for ECE or ECT must obtain a passing rating of seventy percent (70%) in each of the four general subjects given during the examination.

A candidate who obtains a passing rating in the three subjects, but obtains a rating in one subject below 70%, but not lower than 60%, shall be allowed to take one removal examination on the subject where he/she failed to obtain the passing rating.

4. Deliberation

- 1. Consolidated result is deliberated with only the frequency of the grades indicated**

D. Correction & Release of Results

5. Matching of the answer sheet with the name of examinee (decoding).

- 1. Totally computer activity**
- 2. Secured**
- 3. Fast**
- 4. Accurate**

6. Printing and release of results.

- 1. Result of exam shall be released within fifteen (15) days after the date of exam.**

**LICENSURE EXAMINATION
FOR ELECTRONICS
ENGINEERING SYLLABI**

I. MATHEMATICS (20%)

I 1. Algebra & General Mathematics

- I Algebraic functions**
- I Theory of equations**
- I Factorization and algebraic functions**
- I Ratio, proportion and variation**
- I Matrix theory**
- I Arithmetic and geometric progressions**
- I Equations and inequalities**
- I Linear and quadratic equations**
- I Complex number system**
- I Polynomials**
- I Mathematical induction**
- I Logic and probability**
- I Statistics**

I. MATHEMATICS (20%)

I 2. Geometry

- I Lines and planes**
- I Plane figures**
- I Application of Cavalier's, Pappus and Prismoidal theorems**
- I Coordinates in space**
- I Quadratic surfaces**
- I Mensuration**
- I Plane geometry**
- I Solid geometry**
- I Spherical geometry**
- I Analytical geometry**

I. MATHEMATICS (20%)

I 3. Trigonometry

- I Logarithmic principles**
- I Trigonometric functions**
- I Fundamental trigonometric identities**
- I Solutions of right and oblique triangles**
- I Applications of terrestrial mensuration**
- I Area, perimeter and centroid of plane figures**
- I Polar coordinates**
- I Spherical trigonometry**

I. MATHEMATICS (20%)

I 4. Calculus

- I Complex variables**
- I Derivatives and applications**
- I Integration and applications**
- I Transcendental functions**
- I Partial derivatives**
- I Higher derivatives**
- I Indeterminate forms**
- I Multiple integrals**
- I Differential equations**

I. MATHEMATICS (20%)

- | 5. Mathematics Laws, Terms and Theories**
 - | Laws, theories and other rules relative to the fields of mathematics**

II. GENERAL ENGINEERING & APPLIED SCIENCES (20%)

1. Engineering Mechanics

- | Statics**
- | Kinetics**
- | Kinematics**

2. Strength of Materials

- | Stress**
- | Strain**
- | Torsion**
- | Elasticity**

II. GENERAL ENGINEERING & APPLIED SCIENCES (20%)

3. Engineering Materials

- | Properties of Engineering Materials

4. College Physics, General Chemistry, Thermodynamics

- | Matter, Change, Energy
- | Structure of Matter
- | Forces and Motion
- | Heat
- | Sound
- | Light
- | Magnetism
- | Electricity

II. GENERAL ENGINEERING & APPLIED SCIENCES (20%)

5. Engineering Economics and Management

- | Simple and Compound Interest**
- | Annuity, Depreciation,
Commercial Papers**
- | Break-Even Analysis**
- | Management Concepts and
Principles**

II. GENERAL ENGINEERING & APPLIED SCIENCES (20%)

6. Laws and Ethics

- | Contracts and Specifications**
- | Telecommunications and broadcasting laws and regulations**
- | Electronics engineering law of 2004**
- | Code of professional ethics and conduct**
- | Philippine electronics code**
- | Code of Technical Standards and Practice (Manual of Practice)**

III. ELECTRONICS ENGINEERING

(30%)

- I 1. Electricity/ Magnetism Fundamentals**
 - I Atomic structure**
 - I Electric charge**
 - I Laws (Ohms, Kirchoff, Coulomb, etc)**
 - I Magnetic power**
 - I Magnetic field/flux**
 - I Magnetic/electric quantities/units**
 - I Magnetic/electromagnet principles**

III. ELECTRONICS ENGINEERING

(30%)

- I 2. Electrical Circuit**
 - I Ac-dc circuits**
 - I Resistors**
 - I Inductors**
 - I Capacitor**

III. ELECTRONICS ENGINEERING

(30%)

- I 3. Solid State Devices/Circuits**
 - I Semi-conductor fundamentals**
 - I Transistor components, circuits, analysis, and design**
 - I Special services (photo, electric, photo voltaic etc.)**

III. ELECTRONICS ENGINEERING

(30%)

I 4. Power Generator/ Sources/ Principles/ Applications

I Cells and batteries

I Electric generator

I Electronic power supply

I Voltage regulation

I Photovoltaic/thermoelectric generator

I Distribution transformers

I UPS/float-battery system

I Converters/inverters

III. ELECTRONICS ENGINEERING

(30%)

- I 5. Electronic (Audio/RF) Circuit/
Analysis/Design Cells and batteries**
 - I Amplifiers**
 - I Oscillators**
 - I Rectifier**
 - I Filters**
 - I Voltage regulation**

III. ELECTRONICS ENGINEERING

(30%)

- I 6. Tests and Measurements**
 - I Volt-ohm-ammeter (analog/digital)**
 - I R-L-Z bridges**
 - I Oscilloscope**
 - I Cable testers**
 - I RF meters**
 - I Signal generators (audio, RF, video)**
 - I Noise generators**
 - I Power/reflectometer/grid dip meter**

III. ELECTRONICS ENGINEERING

(30%)

- I 7. Microelectronics**
 - I Integrated circuits components, characteristics and products**
 - I Operational amplifiers/multivibrators**

III. ELECTRONICS ENGINEERING

(30%)

- I 8. Industrial Electronics Principles/
Applications**
 - I Electronic control system**
 - I Industrial solid state services**
 - I Welding systems/high frequency heating**
 - I Feedback systems/servomechanism**
 - I Transducers**
 - I Motor speed control systems**
 - I Robotic principles**
 - I Bioelectrical principles**
 - I Instrumentation and control**

III. ELECTRONICS ENGINEERING

(30%)

I 9. Computer Principles

- I Analog/digital systems**
- I Binary number system/Boolean algebra**
- I Mathematical logic and switching networks**
- I Basic digital circuits (logic, gates, flip-flops, multivibrators etc.)**
- I Static and dynamic memory devices**
- I Programming and machine languages**
- I Information and acquisition processing**
- I Analog/digital conversion**
- I Computer networking**

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

I 1. Radio Communication System

I a. Transmission Fundamentals

§ Transmission system

§ Transmission medium

§ Primary line constants

§ Velocity and line wavelength

§ Characteristic Impedance

§ Propagation constants

§ Phase and group velocity

§ Standing waves

§ Voltage Standing Wave Ratio

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

I 1. Radio Communication System

I a. Transmission Fundamentals

§ Telephone lines and cables

§ Wave guides

§ Balanced and unbalanced lines

§ Uniformly distributed lines

§ Twisted pair wire

§ Coaxial Cable

§ The Decibel

§ Power level Calculations

§ Signal and Noise Fundamentals

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

1. Radio Communication System

I b. Acoustics

§ Definition

§ Frequency range

§ Sound pressure level

§ Sound Intensity

§ Loudness Level

§ Pitch and Frequency

§ Interval and Octave

§ Sound distortion

§ Room Acoustics

§ Electro-Acoustic Transducers

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

I 1. Radio Communication System

I c. Modulation

§ Amplitude modulation

§ Phase modulation

§ Frequency modulation

§ Pulse modulation

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

I 1. Radio Communication System

I d. Noise

§ External noise

§ Internal noise

§ Noise calculation and measurements

§ Radio interference

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

I 1. Radio Communication System

I e. Radiation and Wave Propagation

§ Electro Magnetic Radiation

§ Radio Spectrum

§ Wave Propagation

§ Radiation Patterns

§ Wavelength calculations

§ Radiation resistance

§ Diversity systems

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

1. Radio Communication System

I f. Antennas

§ Basic considerations

§ Wire Radiators in Space

§ Isotropic Radiator

§ Current and Voltage Distribution

§ Resonant, non-resonant antennas

§ Terms and definition

§ Antenna gain and resistance

§ Bandwidth, beamwidth, polarization

§ Effects of ground on antennas

§ Grounded, ungrounded antennas

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

I 1. Radio Communication System

I f. Antennas

§ Grounding systems

§ Antenna height

§ Design and applications

§ Matching systems

§ Impedance Calculations

§ Antenna types

§ Directional and non-directional

§ Microwave Antennas

§ Wideband and Special Purpose Antennas

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

1. Radio Communication System

I g. Wire and Wireless Communications

System

- § The telephone set**
- § Connection and performance**
- § Exchange Area Plant**
- § Loop Design**
- § Trunks in the Exchange Plant**
- § Insertion Loss**
- § Traffic Calculations**

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

1. Radio Communication System

I g. Wire and Wireless Communications

System

- § Reference Equivalent and Standards**
- § Telephone networks**
- § Signaling, Billing, CAMA, ANI**
- § Echo, Singing and Design Loss**
- § Via Net Loss**
- § Network Hierarchy, Class Type**
- § VF Repeaters**

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

1. Radio Communication System

I g. Wire and Wireless Communications System

- § Transmission Considerations in Long Distance Network**
- § Telephone Exchanges**
- § PSTN, PABX, Line Concentration**
- § Telephone features-IDD, NDD, LEC**
- § Mobile Communications**
- § Cellular communication, trunk radio, radio paging system etc.**

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

- I 1. Radio Communication System**
 - I h. Microwave Communications and Principles**
 - I i. Basic Principles of various electronics systems**
 - § Electro-optics, photonics/optoelectronics**
 - § Electromagnetics**
 - § Avionics, aerospace/ navigational and military operations**
 - § Medical Electronics**
 - § Cybernetics**
 - § Biometrics**

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

I 2. Digital and Data Communications Systems

I a. Digital Communication Networks

§ Bit and Binary Transmission

§ Signaling Rate

§ Error Probability

§ Digital Filtering

§ Switching

§ Packet Circuit

§ Vertical Circuit

§ Open Systems Interconnection

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

I 2. Digital and Data Communications Systems

I a. Digital Communication Networks

§ Multiplexing, Modulation and Synchronization

§ Pulse Code modulation

§ Companding

§ Encoding

§ Bandwidth and Signal to Noise Ratio

§ Delta Modulation

§ Slope Overload

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

I 2. Digital and Data Communications Systems

I a. Digital Communication Networks

§ Adaptive Delta Modulation

§ Codes and Protocols

§ Error Detection and Correction Codes

§ Digital Carrier Systems

§ Frequency Shift Keying

§ Phase Shift Keying

§ Differential Phase Shift Keying

§ DC Nature of Data Transmission

§ Loops

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

I 2. Digital and Data Communications Systems

I a. Digital Communication Networks

§ Neutral and Polar

§ Binary Transmission and the Concept of Time

§ Asynchronous and Synchronous

§ Timing

§ Distortion

§ Bits, Band, WPM

§ Data Interface Standards

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

I 2. Digital and Data Communications Systems

I a. Digital Communication Networks

§ Data Input/Output Devices

§ Digital Transmission on Analog Channel

§ Modulation-Demodulation Schemes Parameters

§ Circuit Conditioning

§ Modem Applications

§ Serial and Parallel Transmission

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

I 2. Digital and Data Communications Systems

I b. Fiber Optics

§ Principles of Light, Transmission

§ Types

§ Light Sources, Laser, LED

§ Light Detectors

§ Modulation and Waveform

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

I 2. Digital and Data Communications Systems

I b. Fiber Optics

§ System Design

§ General Application

§ Design Procedure

§ Dispersion Limited Domain

§ System Bandwidth

§ Splicing Techniques

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

I 3. Satellite , Broadcasting and Cable TV Systems

I a. Satellite System

§ The Satellite System

§ Types of Satellite

§ Satellite Orbit

§ Uplink Considerations

§ Demand Assignment Multiple Access

§ Antenna Tracking

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

I 3. Satellite , Broadcasting and Cable TV Systems

I a. Satellite System

§ Satellite Link Budgets

§ Path Loss

§ Figure of Merit

§ Ratio of Carrier to Thermal Noise Power

§ Station Margin

§ VSAT

IV. ELECTRONICS SYSTEMS AND TECHNOLOGIES (30%)

I 3. Satellite , Broadcasting and Cable TV Systems

I b. Broadcasting and Cable TV systems

§ Radio Transmitter (AM, FM, Television)

§ Studio (Microphone, Amplifiers, Cameras, Lighting, etc.)

§ Cable Television

Board of Electronics and Communications Engineering

Sylvia I. Marcelo
Chairman

Nestor C. Dacanay
Member

Joel B. Bajador
Member

**Schedule of
Board Exam:
November 3 & 4, 2007**