



Republic of the Philippines
NUEVA ECILIA UNIVERSITY OF SCIENCE AND TECHNOLOGY

Cabanatuan City

044-463-0226

www.neust.edu.ph

INVITATION TO BID

The Nueva Ecija University of Science and Technology through its Bids and Awards Committee (BAC), invites entities to bid for the hereunder projects:

Name of Project: **Physics Laboratory Equipment for College of Engineering**

Location: College of Engineering – NEUST, Cabanatuan City

Approved Budget for the Contract (ABC): Php 2,988,404.00

Contract Duration: 120 Calendar Days

Fund Source: Income

Bid Documents: Php 5,000.00

ITEM DESCRIPTION/SPECIFICATION:

Item	Qty	Description
1	1 unit	Digital Calliper <ul style="list-style-type: none">Measures up to 6 inches or 18 cmResolution of .0005 inches or .01 mmIncludes protective plastic case.
2	1 unit	Micrometer <ul style="list-style-type: none">Range: 0 to 25 mmResolution: 0.1 mmIncludes form fitted wooden case for storage
3	1 set	Super Pulley Force Table <ul style="list-style-type: none">Removable legs for storageIncludes three low-friction pulleys with clampsAdjustable pulley height for reduced parallax[Laminated surface with built in scale
4	1 set	Mass and Hanger Set <i>Includes:</i> <ul style="list-style-type: none">4x Mass hanger (5.0 g)3x 100 g mass (brass)3x 50 g mass (brass)6x 20 g mass (brass)3x 10 g mass (aluminum)3x 5.0 g mass (aluminum)3x 2.0 g mass (plastic)3x 1.0 g mass (plastic)

		<ul style="list-style-type: none"> • 3x 0.5 g mass (plastic) • 1x Storage Case
5	1 set	<p>Standard Smart Cart Metal Track 1.2 m System</p> <ul style="list-style-type: none"> • Smart Carts are completely instrumented with all the sensors you need for dynamics • Bluetooth cart connection facilitates live data displays on student devices • Carts feature two string tie positions • Red and blue carts for distinguishing during collisions • Conductive track facilitates the study of induced magnetic drag • Track features a high-contrast scale for quick measurements <p><u>Includes:</u></p> <ul style="list-style-type: none"> • 1x 1.2 m Aluminum Dynamics Track • 1x Smart Cart (Red) • 1x Smart Cart (Blue) • 1x PAScar Cart Mass (set of 2) • 1x Super Pulley with Clamp • 1x IDS Spring Kit • 1x Friction Block - IDS • 1x Angle Indicator • 1x Dynamics Track End Stop (2 Pack) • 1x Dynamics Track Feet (Pair) • 1x Track Rod Clamp • 1x Smart Cart Rod Stand Adapter
6	1 set	<p>Discover Friction Accessory</p> <ul style="list-style-type: none"> • Specially designed to work with carts and sensors • Students can discover concepts as coefficient of friction, static friction, kinetic friction and sliding friction equations • 2 Trays of identical plastic surfaces can be hooked together to explore surface vs. sliding frictional forces • includes: 4 Friction Trays (1 Felt, 1 Cork, 2 Plastic) • Easy Storage: friction trays are stackable, both for adjusting the pulling height and storage • Versatile: allow students to discover key friction concepts
7	1 set	<p>Projectile Launcher Smart Gate System</p> <ul style="list-style-type: none"> • The Mini Launcher and Smart Gate make the setup simple: Just clamp the launcher to the table and slide the Smart Gate on. <p><u>Includes:</u></p> <ul style="list-style-type: none"> • 1x Smart Gate with Mounting Bracket • 1x Launcher with Mounting Stand • 2x Steel Balls with Loading Rod • 1x 2-D Collision Accessory • 1x Aluminum Table Clamp • 1x 45 cm Stainless Steel Rod • Range: 0.5, 1, 2 m • Launch Angle: Angle: 0 to +90° and 0 to -45°

		<ul style="list-style-type: none"> • Launcher Length: 18 cm
8	1 unit	<p>Time-of-Flight Accessory</p> <ul style="list-style-type: none"> • Compatible with high speed USB-based computer interfaces • Piezo electric circuit generates TTL timing signal from projectile impact • Compatible with spring-powered projectile launchers • Pad (20 by 20 cm) made from high strength plastic • Includes 1 meter long connecting cable • Use with computer interface or equivalent electronic timers
9	1 unit	<p>Phone Jack Extender Cord</p> <ul style="list-style-type: none"> • Six meter phone-jack-to-phone-jack cable • Designed for use with 7.5 cm wide photogates and similar devices
10	1 unit	<p>Van de Graaff Generator, High Voltage</p> <ul style="list-style-type: none"> • The High Voltage Van de Graaff Generator features a 25 cm diameter sphere that can generate approximately 400,000 volts. • The size of the sphere, its rounded edges, and its height from the demonstration table contribute to the high voltages generated. <p><u>Features:</u></p> <ul style="list-style-type: none"> • Large 25 cm dome for easy visibility • Sparks of up to 35 cm in length • Tall lucite column keeps sphere far above the base, allowing a large voltage generation, and is thick-walled to withstand years of use • Variable speed motor to adjust charge buildup • Belt is easy to replace (one extra belt included) <p><u>Includes:</u></p> <ul style="list-style-type: none"> • 1x Van de Graaff Generator, High Voltage • 1x Installed belt • 1x Replacement belt
11	1 unit	<p>Discharge Sphere</p> <ul style="list-style-type: none"> • 25 cm sphere supported on a Lucite column with a cast iron base • Includes cabling for connection to a Van de Graaff generator or to a ground
12	2 set	<p>Replacement Belt, Van de Graaff</p> <ul style="list-style-type: none"> • Replacement belt for Van de Graaff Generator SE-8691
13	1 unit	<p>Power Supply (18 V DC, 3A)</p> <p>Digital Meters Voltage and current; Backlit LCD</p> <p>Constant Voltage Output continuously variable</p> <p>Constant Voltage Line Regulation <0.01% ±3 mV</p> <p>Constant Voltage Load Regulation <0.01% ±2 mV</p> <p>Constant Voltage Ripple and Noise <0.5 mV rms</p> <p>Constant Current Output continuously variable</p> <p>Constant Current Line Regulation <0.2% ±3 mA</p> <p>Constant Current Load Regulation <0.2% ±3 mA</p> <p>Constant Current Ripple <3 mA rms</p> <p>Power Source AC 100, 120, 220, 240 V ±10%, 50/60 Hz; Protection – overload and reverse polarity protected</p> <p>Dimensions 34 x 26 x 15 cm (11.5 kg)</p>

14	1 unit	2-Meter Patch Cord Set <ul style="list-style-type: none"> • Set of 4 total • 2 Meter Patch Cord Set • Red and Black • Stackable • Spring connectors rotate in the grips
15	1 set	Equipotential Field Mapper <ul style="list-style-type: none"> • Includes Silver conductive ink pen and circular template • 50 sheets conductive paper 30 x 45 cm • 100 sheets conductive paper with cm grid 23 x 30 cm • 2 ea. electrometer probes, 10 pushpins and 1ea connecting wire • Point charge holder; 32 x 48 cm plastic tray with corkboard top
16	1 set	Essential Physics Modular Circuits Kit <u>Includes:</u> <ul style="list-style-type: none"> • 1x Wireless Voltage Sensor • 1x Wireless Current Sensor Module • 5x Straight Module • 2x Tee Module • 4x Corner Module • 45x Jumper Clip • 2x Battery Holder Module • 2x AA-cell Battery • 3x Light Bulb Module (with bulb) • 1x SPST Switch Module • 1x SPDT Switch Module • 1x Potentiometer Module • 1x 1000-Turn Coil/Inductor Module • 1x Motor Module • 1x 0.33 F Capacitor Module • 1x 10 Ω Resistor Module • 1x 33 Ω Resistor Module • 1x 100 Ω Resistor Module • 1x LED Module • 1x Spring Clip Module • 2x 1000 Ω Resistor • 2x 330 Ω Resistor • 1x 220 Ω Resistor • 1x 22 Ω Resistor • 1x 100 μF Capacitor • 1x 330 μF Capacitor • 1x Diode • 8x Cylindrical Magnet 0.5 in x 0.25 in • 1x Compass • 1x Grattnell's Case
17	1 set	SF-8616 - Basic Coil Set <ul style="list-style-type: none"> • Includes one 200 turn, two 400 turn, and one 800 turn coils

		<ul style="list-style-type: none"> • Includes "U" shaped laminated iron core • Coils are color coded for easy turn number identification • Coils have banana plug connectors
18	1 set	Voltage Sensor <ul style="list-style-type: none"> • The Voltage Sensor plugs into the 8-pin analog channel Interface to measure voltage at sample rates up to 10 MHz. Software recognizes that a probe has been plugged in. • Auto-detected on the Universal Interface • 8-pin DIN, plugs into analog channel • Includes unshrouded banana jacks and unshrouded alligator clips.
19	1 set	Wireless Magnetic Field Sensor <ul style="list-style-type: none"> • Ranges: ± 50 G and ± 1300 G • Resolution: ± 0.01 G (50 G range); ± 1 G (1300 G range) • Maximum Sample Rate: 100 Hz • Measurements: Magnetic Field Strength (3 axes and resultant) • Logging; Yes • Battery: Rechargeable Lithium-Polymer • Connectivity: Direct USB or via Bluetooth 4.0 • Battery & Logging • Stored Data Points Memory (Logging): >25,000 • Battery - Connected (Data Collection Mode): >72 hr • Battery - Logging (Data Logging Mode): 3.5 days • Battery Type: LiPo
20	1 set	Alnico Bar Magnets (2 Pack) <ul style="list-style-type: none"> • Dimensions are 150 mm by 13 mm • Made of Alnico alloy • Polarity indicated by notched north poles • Magnets fit into a St. Louis motor
21	1 set	Iron Filings (1 lb pkg) <ul style="list-style-type: none"> • Iron filings sprinkled over a bar magnet instantly make the magnetic field visible.
22	1 set	Smart Gate Pulley System <ul style="list-style-type: none"> • Photogate with two photo detector spaced 1.5 cm apart • 1 Auxiliary port • Threaded hole (1/4"-20) • Photogate tape slot • Laser switch detector • Indicator LED • Swivel rod clamp • Mounting rod • Super pulley • Symmetrical rise and fall time for all 4 ports
23	1 unit	Rotating Platform <ul style="list-style-type: none"> • Dual low friction bearings for shaft • Four kg "A" frame base with adjustable feet and motor mount • 48 cm extruded rotating platform with built in scale

		<ul style="list-style-type: none"> • Support rod to hold pulley and mass or a 7.5 cm photogate • Two 300 g rectangular masses • Low-friction pulley mounted on spindle for applying torque
24	1 unit	<p>Wireless Force Acceleration Sensor</p> <ul style="list-style-type: none"> • Wireless force and acceleration sensor • Bluetooth smart compatible • Compatible with iOS, Android, Chromebook, MacOS and Windows • Built in logging • In application Bluetooth pairing • Measures both force and 3 axis acceleration • Compatible to be mounted on carts and rod stands • Range (Force): +/- 50 N • Resolution (Force): 0.03 N • Max Sample Rate: 1 Hz • Maximum Overload: 75 N • Battery life: 70 hours on low sample rate
25	1 unit	<p>Wireless Centripetal Force Accessory</p> <ul style="list-style-type: none"> • The Wireless Centripetal Force Accessory is a low friction sliding mass holder that connects to a Wireless Force Acceleration Sensor • When installed on a Rotating Platform, it provides a simple and direct measurement of centripetal force and acceleration. Vary the mass using the holed masses in the Mass and Hanger set. • The string length is easily adjusted to vary the radius. <p><u>Includes:</u></p> <ul style="list-style-type: none"> • 1x Low-friction sliding mass holder • 1x Mounting post for force sensor
26	1 unit	<p>Density Set</p> <ul style="list-style-type: none"> • Includes three 2.2 cm dia. cylinders of aluminum, brass and plastic • Two blocks; aluminum 1.9 x 3.2 x 4.1 cm; brass 1.6 x 1.9 x 2.8 cm • Includes one irregular aluminum shape • Manual included
27	1 unit	<p>Overflow Can</p> <ul style="list-style-type: none"> • Aluminum can provides direct volume measurements for the materials supplied in the Density Set. • 76 mm diameter, with a volume of 477 mL and an angled down spout
28	1 unit	<p>String Vibrator</p> <ul style="list-style-type: none"> • Great tool for Mechanical waves demonstrations • Study wave speed, frequency, wavelength, amplitude, interference and resonance • Built-in Rod Clamps for mounting horizontally or vertically • Stainless Steel Tongue of flexible metal is mounted to a powerful neodymium magnet • Air vents on the unit allows good air circulation to prevent overheating • Specially designed grooves and holes allow the unit to be clamped or mounted to a surface

		<p><u>TYPICAL APPLICATIONS:</u></p> <ul style="list-style-type: none"> • Standing wave patterns--learn about constructive and destructive interferences • Mechanical Wave Characteristics --Wave speed, string density, frequency, amplitude, wavelength <p><u>Includes:</u></p> <ul style="list-style-type: none"> • String Vibrator Unit • Constant Frequency Power Supply (60 Hz) • Wave Cord (3 meter)
29	1 unit	<p>2-Meter Patch Cord Set</p> <ul style="list-style-type: none"> • Set of 4 total • 2 Meter Patch Cord Set • Red and Black • Stackable • Spring connectors rotate in the grips
30	1 unit	<p>Wireless Temperature Sensor</p> <ul style="list-style-type: none"> • Wireless temperature sensor • Uses coin cell battery operated • Bluetooth smart compatible • Compatible with iOS, Android, Chromebook, MacOS and Windows • Built in logging • In application Bluetooth pairing • Waterproof (IP67) • Range: -40 to 125 deg C • Accuracy: +/- 0.5 deg C • Resolution: .01 deg C • Units: deg C, deg F or K • Max sample rate: 10 Hz • Max wireless range: 30 m (unobstructed) • Expected battery life: 1 year
31	1 unit	<p>Basic Calorimetry Set</p> <ul style="list-style-type: none"> • Six Styrofoam calorimeters • Thermometer with range of 20° C to 110° C with 1° resolution • Water trap and plastic tubing included • Aluminum, copper and lead included for specific heat determination • Instruction manual and experiment guide
32	1 unit	<p>Thermal Expansion Apparatus</p> <ul style="list-style-type: none"> • The 3.5 mm jack from the Thermistors can be connected directly to a Quad Temperature Sensor using an interface and data collection and analysis captured by software. • Or the 3.5 mm jack can be connected to the input on the base with a digital multimeter connected to the apparatus via banana jacks and the resistance of the thermistor measured. <p><u>Features:</u></p>

		<ul style="list-style-type: none"> • Built-in Digital Gauge: Measure the rod expansion with 0.01 mm resolution • Built-in Thermistor: A 10 k thermistor is connected directly to each tube and the temperature can be determined using a digital ohmmeter or Temperature Sensor. • Heat with Steam or Water: The fluid used may be steam or water at any temperature. • Three Drop-in Metal Tubes: Each tube connects securely onto the rigid base. The other two can be simultaneously mounted on the base for convenient storage. <p><u>Includes:</u></p> <ul style="list-style-type: none"> • 1x Base with built-in dial gauge and thermistor • 1x Expansion tubes brass, copper and aluminum; 16 mm dia. (80 cm length)
33	1 unit	<p>Steam Generator</p> <ul style="list-style-type: none"> • Steam output is 10 gram/minute • Variable power (0 - 400 watts) for adjustable steam flow • Automatic safety shut-off • Internal electric coils • Dual steam ports • Baster included for removing hot water for experiments
34	1 unit	<p>Mechanical Equivalent of Heat Apparatus</p> <ul style="list-style-type: none"> • This Apparatus is accurate to 5 % • It has rugged ball bearing construction and a Thermistor that way there is no thermometer to break • There is also a crank counter attached so you can't forget how many times you have cranked • It has double ball bearings to prevent the wear on moving parts • The apparatus is simple and accurate. As the crank is turned, the friction between the rope and the cylinder is just enough to support a mass hanging from the other end of the rope. • The ratio between the work performed and the thermal energy produced and transmitted to the cylinder determines J, the mechanical equivalent of heat. <p><u>Includes:</u></p> <ul style="list-style-type: none"> • The base, cylinder, crank and counter with a built-in clamp • 2.7 meters of flat nylon rope • A 1 gallon can that can be filled with a measured mass of sand or water (if 10 g of laboratory masses are not available) • Laboratory manual including theory, step-by-step instructions and data tables.
35	1 unit	<p>Digital Multimeter 3-3/4 digits 4000 count Easy to read large LCD with Backlight Large breaking capacity fuse 30kA 1.5V battery check function Thermo plastic elastomer, high resistance against drop shock</p>

		<p>Safety cap on current terminal Data hold, Range hold, Relative function Continuity check, Diode test Auto power off function (30min.) Maximum 20A can be measured if the measurement time is less than 10 seconds. (Take 10 minutes or longer intervals between measurements) Display : numeral display 4000 Sampling rate : 3 times / sec. AC frequency bandwidth : 40~400Hz (sine wave) Image</p>
36	1 unit	<p>Triple-Beam Balance (with Tare)</p> <ul style="list-style-type: none"> • Accurate, easy to use, durable and sturdy • Pan is removable with magnetic damping for quick and true measurements • Balance height can be adjusted • Capacity: 610 grams • Readability: 0.1 gram • Tare: 225 grams
37	1 set	<p>Resistivity Apparatus</p> <ul style="list-style-type: none"> • Relate Resistance to Wire Length • Determine Resistivity of Different Materials <p><u>Includes:</u></p> <ul style="list-style-type: none"> • Resistivity Apparatus • Voltage Sensor (unshrouded) • Banana Plug Cord-Red (5 Pack)
38	1 unit	<p>Energy Transfer - Calorimeter</p> <ul style="list-style-type: none"> • Compare electrical energy input to changes in internal energy • Features a 10 Ohm heating resistor (instead of a coil) mounted to a circuit board which allows students to investigate the relationship between the input energy and heat transfer into the water. <p><u>Includes:</u></p> <ul style="list-style-type: none"> • 2 Aluminum cups (Outer: 8.9 cm tall, 4.7 cm diameter; Inner: 7.5cm tall, 3.8 cm diameter) • Plastic lid, two-hole rubber stopper, heating resistor with input cables
39	1 unit	<p>Basic Optics System</p> <ul style="list-style-type: none"> • Large 50 mm diameter optics components mounted in protective holders that snap directly onto aluminum track • Built-in metric tape makes measurement of image and object distances quick and accurate • Versatile Light Source doubles as table-top Ray box for studies in Reflection, Refraction, Color Addition & Snell's Law <p><u>Includes:</u></p> <ul style="list-style-type: none"> • 1.2m Aluminum Optics Bench with built-in metric tape • Geometric Lens Set (+100, +200 mm lens) • White Plastic Viewing Screen that Snaps on Track • Basic Optics Light Source (specifications as follows:)

		<p>[a] Single 10-watt quartz-halogen bulb provides bright, easy-to-see illumination without a lot of heat</p> <p>[b] Provides a Point Source, Crossed Arrow Object with metric Scale, Three Primary Color Source and ,3, or 5 Ray Source</p> <p>[c] Use free standing or easily clip directly to Basic Optics Track</p> <ul style="list-style-type: none"> • Ray Optics Kit (specifications as follows): <p><u>Includes:</u></p> <ul style="list-style-type: none"> • Double Concave and Convex Lenses, Trapezoid Triangular Mirror Accessory with Concave, Convex and Plane Reflective surfaces, Hollow Lens to fill with a liquid or use as an air lens • Optics Table OS-8465 (specifications as follows): <ul style="list-style-type: none"> [a] Provides an excellent viewing surface for ray optics [b] Polar grid printed directly on the table allows for easy measurement [c] Includes an acrylic cylindrical D lens • Adjustable Lens Holder • Accessory Lens Set (+250, -150 mm lens) • Convex/Concave Mirror Accessory • Experiment Manual
40	1 unit	<p>Universal Interface</p> <ul style="list-style-type: none"> • USB or Bluetooth compatible • Compatible with iOS, Android, Windows, MacOS and Chromebook • Wireless connectivity • 2 high speed analog inputs, +/- 10 Differential input • Selectable voltage gain: x1, x10, x100 • Bi-directional digital input • 2 digital inputs for photogates or time-of-flight accessories, with 0-5V TTL • Signal generator with waveforms of: sine, triangle, square wave, positive and negative ramps, DC, custom user • Frequency of .0001Hz to 100 KHz at 1 mHz resolution • Amplitude range of +/- 8V • Resolution of 3.9mV, 12-bit DAC • Selectable voltage limit and DC offset • Frequency sweep function • Measure output current, voltage • 2 sensor inputs • 2 MHz max sampling rate • 12-bit resolution on analog input
41	1 unit	<p>Physics Site License Software</p> <ul style="list-style-type: none"> • Data collection and analysis software • Works with MacOS and Windows • Contains the following features graphs, tables, oscilloscope, fft, histogram, calculator, video capture, video analysis, predictions, live data capture, stop and start conditions, play back for data and video • Electronic lab workbooks • Electronic journal including annotations

	<ul style="list-style-type: none"> • Video Analysis with the following features: zoom tool, vectors, auto tracking • 4 different modes of video modes: opening an existing video, capture an image, record a video and record a video with data • Compatible with mpeg-4, avi and quicktime video files • Calculator with ability to use measurements or user input • Undo/Redo • Ability to replay data or video capture including looping data and video • Ability to set non-common rate of sampling on sensors • Multiple language support • Data capture in FFT and Oscilloscope modes • Print capabilities
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Warranty, Terms and Conditions:

- 2-years product warranty
- 10 years availability of spare parts

Bidders must submit the following:

- Technical specifications details or Technical data indicating the brand name and model of item/s as additional technical requirements.
- After sales training-workshop at Nueva Ecija University of Science and technology after completion of deliver.

The schedule of the bidding activities are as follows:

Activities	Schedule
1. Advertisement/Receipt of Letter of Intent	January 26, 2021 to February 02, 2021
2. Pre-bid Conference	February 04, 2021 10:30 AM NEUST President's Office Conference Room, Sumacab, Cabanatuan City
3. Submission of Bids	February 16, 2021, UNTIL 5:00 PM NEUST President's Office Conference Room, Gen. Tinio St., Cabanatuan City
4. Opening of Bids	February 17, 2021 10:30 AM NEUST President's Office Conference Room, Sumacab, Cabanatuan City
5. Post Qualification	February 18, 2021 10:30 AM NEUST President's Office Conference Room, Sumacab, Cabanatuan City

Letter of Intent must be submitted personally and in hard copy format at the Office of the BAC Secretariat, NEUST, Gen. Tinio (St.) Cabanatuan City on or before 5:00PM on February 02, 2021.

Bidding will be conducted through open competitive bidding procedures using a non-discretionary “pass/fail” criterion as specified in the 2016 Revised Implementing Rules and Regulations (IRR) of Republic Act (RA) 9184, otherwise known as the “Government Procurement Reform Act”.

Bidding is restricted to Filipino citizens/sole proprietorships, partnerships, or organizations with at least sixty percent (60%) interest or outstanding capital stock belonging to citizens of the Philippines, and to citizens or organizations of a country the laws or regulations of which grant similar rights or privileges to Filipino citizens, pursuant to RA 5183.

A complete set of Bidding Documents may be acquired by interested Bidders from February 04 – February 16, 2021 upon payment of the applicable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB in the amount of P5,000.00.

It may also be downloaded free of charge from the website of the Philippine Government Electronic Procurement System (PhilGEPS) and the website of the Procuring Entity, provided that Bidders shall pay the applicable fee for the Bidding Documents not later than the submission of their bids.

Bids must be duly received by the BAC Secretariat at the address below on or before February 16, 2021 - 5:00PM. All Bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in the PBD.

Bid opening shall be on February 17, 2021, 10:30AM at NEUST Conference Room, Sumacab, Campus, Cabanatuan City. Bids will be opened in the presence of the bidders’ representatives who choose to attend at the address below. Late bids shall not be accepted.

The Nueva Ecija University of Science and Technology reserves the right to reject any and all bids, declare a failure of bidding, or not award the contract at any time prior to contract award in accordance with Section 41 of RA 9184 and its IRR, without thereby incurring any liability to the affected bidder or bidders.

For more information concerning this bidding, please contact the following:

MS. MICHELLE A. SUPEÑA
Bids and Awards Committee Secretariat
NEUST Gen. Tinio St., Cabanatuan City
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Email Address: neustmain@yahoo.com

Approved by:

DR. HONORATO P. PANAHO
BAC Chairperson