



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES

PUP San Pedro Campus
San Pedro, Laguna

**ACCREDITING AGENCY OF CHARTERED COLLEGES AND UNIVERSITIES
(AACCUP)**



AREA V: Research

**Bachelor of Science in
Information Technology**



❖ A.1. Copy of the Institutional Research Agenda

UNIVERSITY RESEARCH AGENDA

As a state university with the largest number of enrollees belonging to the marginalized sector of society, the research program of the Polytechnic University of the Philippines (PUP) is directed at social capital and innovation towards inclusive growth for national development. Research in the university, being the primary source of new knowledge and a laboratory of highly competent and skilled human capital, is an incubator of innovations and technologies with the end goal of economic growth of the country and the community.

The focus of the research program of the University is multi-, inter- and trans-disciplinary and collaborative in nature, with emphasis on sustainable development, answering especially questions "what kind of research is done?", "what are the objectives?", and "what impact will the research have?" The University's research program is complimentary to research and development (R&D), technology transfer, innovation, and commercialization activities.

Research is one of the major functions of higher education. Thus, the University encourages its faculty members, non-teaching personnel and students to be actively engaged in research undertakings to ensure the continued growth and development of PUP as a higher education institution.

Research undertakings in the University shall be guided by the following general principles set by the National Higher Education Research Agenda-2 (NHERA 2) of the Commission on Higher Education (CHED):

- Research is the ultimate expression of an individual's innovative and creative powers. PUP shall ensure that the academic environment nurtures and supports research talents.
- Research thrives in an environment characterized by free flow of information, honest and analytical exchange of ideas, and supportive policy and administrative structures. PUP policies shall enhance the institution's and the individual's capacity to conduct independent, collaborative, and productive research.
- Research is one of the functions of higher education sector. PUP is expected to lead the conduct of discipline-based, policy-based, technology-directed, and innovative/creative researches that are locally responsive and globally competitive

The current PUP administration's vision is to become a National Polytechnic University (*Pambansang Politeknikong Unibersidad*).



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As to its mission, the university ensures inclusivity and equitability of the quality of education and promoting lifelong learning opportunities through a re-engineered polytechnic university by committing to: (1) provide democratized access to educational opportunities for the holistic development of individuals with global perspective (*pagbigay ng pantay na pang-akademikong oportunidad para sa holistikong pag-unlad ng indibidwal na may pandaigdigang perspektiba*); (2) offer industry-oriented curricula that produce highly-skilled professionals with managerial and technical capabilities and a strong sense of public service for nation building (*paghain ng akademikong programa na tumutugon sa pangangailangan ng industriya na magluluwal ng mga propesyunal na may kahusayan sa pamamahala at kasanayang teknikal gayundin may matatag na kamalayang mapaglingkod para sa pagbuo ng bansa*); (3) embed a culture of research and innovation (*paglangkap ng kultura ng pananaliksik at inobasyon*); (4) continuously develop faculty and employees with the highest level of professionalism (*patuloy na pagpapaunlad ng kaguruan at kawani sa pinakamataas na antas ng propesyunalisasyon*); (5) engage public and private institutions and other stakeholders for the attainment of social development goal (*paghikayat sa pampubliko at pribadong institusyon at iba pang pinaglilingkuran para sa pagkakamit ng hangaring panlipunang pag-unlad*); at (6) establish a strong presence and impact in the international academic community (*paglikha nang matatag na pag-iral at impluwensya sa internasyunal na komunidad pang-akademiko*).

The University Research Vision, Mission, and Objectives

The Office of the Vice President for Research, Extension, Planning and Development (OVPREPD) is tasked to ensure that the University research policy resonates with University's Vision, Mission, Goals and Objectives as well as the Commission on Higher Education (CHED) Research Thrusts and Priorities, National Economic and Development Authority (NEDA)-AMBISYON 2040 and other related thrusts of government institution/s. Through its offices, institutes, and centers, OVPREPD shall see to the implementation of its mandated task - the undertaking of various research, extension, and developmental activities of the University.

The R&D Sector of the University Visions' Towards a relevant- focused research program and result-oriented extension development plan. Its mission is to institutionalize research and extension as major undertakings of the University. Research and development in PUP shall contribute to the transformation of the University as an epistemic community, a research-intensive polytechnic university, and in advancing knowledge across multidisciplinary areas to address the immediate and long-range needs of society. The R & D in the University shall endeavor to produce research and innovation that promote educational, technological, economic, political, ecological, social, and cultural understanding toward the alleviation of the plight of the poor, the development of the citizenry, and the enhancement of nation-building and global competitiveness.



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In particular, the research sector shall play a significant role in the realization of the University's 'envisioned society' of: (1) sustainable human development; (2) democratic and good governance; (3) respect for cultural diversity and strengthened national identity; (4) technology human touch; and (5) ecological harmony. With the current administration's Ten (10) Pillars, the University commit to Implement a Vigorous Research Production and Utilization (Pillar 6) - *Masikhay na Produksyon at Pakikinabang ng Pananaliksik*.

To fulfill this mission, the Office of the Vice-President for Research, Extension, Planning and Development (OVPREPD) formerly the Office of the Vice-President for Research, Extension, and Development - OVPRED shall endeavor to achieve the following objectives:

1. To contribute to the country's national development through a focused-university research program.
2. To promote synergy and a sound research capability program through collaboration of the research and academic sectors of the University.
3. To pursue excellence in production and publication of research and creative works among faculty and students.
4. To develop strong research linkages and partnerships with other national and international institutions and organizations.
5. To pursue excellence in innovation, technology transfer and commercialization research outputs with the end goal of economic, environmental, and social growth.



❖ A.1. Copy of the Institutional Research Agenda

The University's Research Agenda	The College Research Goals & Objectives	The Program's Research Thrusts	The Specific Government Agenda Parallel to the Program and their Objectives
<p>The University Research Agenda</p> <p>The University adopts a clear, practical, and realizable University Research meant to (1) be aligned with the strategic plan of the University; (2) unify the direction and framework of the research activities of the University; (3) align the research efforts of the University with the thrust and priorities of national government agencies e.g. Department of Science and Technology (DOST), National Economic and Development Authority (NEDA), Commission on Higher(CHED), among others; and (4) generate researches, scientific innovations, speculative and the paradigms which are</p>	<p>PUP San Pedro Campus GOALS (2020 – 2025)</p> <p>The Polytechnic University of the Philippines San Pedro Branch, consistent with the national development thrust and the mission of the Polytechnic University of the Philippines, visualizes itself to become the center of excellence in instruction, research, production, extension and the humanities through an affordable but quality education in the area.</p> <p>To respond to the vision towards “The National Polytechnic University”, the Branch</p>	<p>Common to the discipline OF BS Information Technology</p> <p>a. analyze complex problems, and identify and define the computing requirements needed to design an appropriate solution (Graduate Outcomes: CS02, IS02-03, IT03)</p> <p>b. apply computing and other knowledge domains to address real-world problems (Graduate Outcomes: CS01, ISO1, IT01)</p> <p>c. design and develop computing solutions using a system-level perspective (Graduate Outcomes: CS03-05, IS04-05, IT05)</p> <p>d. utilize modern computing tools (Graduate Outcomes: CS06, IS06, IT07)</p>	<p>The President Marcos Proposed 10 Point Socio-Economic Agenda from 2022-2028</p> <ul style="list-style-type: none"> • protect the purchasing power of families by ensuring food security, reducing transport and logistics costs, and reducing energy costs. • reduce vulnerability and mitigate scarring from the COVID-19 pandemic by tackling health, strengthening social protection, and addressing learning losses. • ensure sound macroeconomic fundamentals by improving bureaucratic efficiency and ensuring sound fiscal management. • create more jobs by promoting investments, improving infrastructure, and ensuring energy security, among others. • create quality jobs by increasing employability, encouraging research and development and innovation, and enhancing the digital economy. • create green jobs by pursuing a green and blue economy and establishing livable and sustainable communities. • uphold public order and safety, peace, and security. • ensure a level playing field by strengthening market competition and reducing barriers to entry and limits to entrepreneurship <p>Source: https://newsinfo.inquirer.net/1635258/bongbong-marcos-team-presents-8-point-economic-agenda#ixzz7yJlCoWn5</p>

<p>expected to propel economic, scientific, social, cultural and technological development.</p> <p>The University Research Agenda is categorized into five general themes, to wit: (1) poverty reduction, peace and security; (2) accelerating infrastructure development through science and technology; (3) competitive industry and entrepreneurship; (4) social and cultural development and (5) conservation, protection and rehabilitation of the environment towards sustainable development.</p> <p>Agenda 1: Poverty Reduction, Peace and Security</p> <p>This research theme addresses three important national and global issues that mankind is squarely faced: poverty, peace and security. The University is in the belief that these issues are interrelated-solving one means solving others.</p>	<p>focuses, prioritizes and implements the following goals:</p> <ol style="list-style-type: none"> 1. Continue its commitment to become the leading center of academic excellence in the region; 2. Instill well-rounded values reflective of optimism, gratefulness, integrity and nationalism among every member of the academic community; 3. Provide improved and modernized infrastructures and physical facilities; 4. Sustain partnership with 	<p>Objectives of the Bachelor of Science in Information Technology of the program have the ability to:</p> <p>a. Knowledge for Solving Computing Problems; IT01 - Apply knowledge of computing, science, and mathematics appropriate to the discipline. IT02 - Understand best practices and standards and their applications.</p> <p>b. Problem Analysis; IT03 - Analyze complex problems, and identify and define the computing requirements appropriate to its solution. IT04 - Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.</p> <p>c. Design/Development of Solutions; IT05 - Design, implement, and evaluate computer-based systems, processes, components, or programs to</p>	<p>The President Duterte's 10 point agenda supported by the Philippine Development Plan (PDP) 2017 created under EO No 5 approving and adopting AMBISYONNATIN2040. Priorities are;</p> <ol style="list-style-type: none"> 1. Continue and maintain current macroeconomic policies, including fiscal, monetary, and trade policies. 2. Institute progressive tax reform and more effective tax collection, indexing taxes to inflation. A tax reform package will be submitted to Congress by September 2016. 3. Increase competitiveness and the ease of doing business. This effort will draw upon successful models used to attract business to local cities (e.g., Davao) and pursue the relaxation of the Constitutional restrictions on foreign ownership, except as regards land ownership, in order to attract foreign direct investment. 4. Accelerate annual infrastructure spending to account for 5% of GDP, with Public-Private Partnerships playing a key role. 5. Promote rural and value chain development toward increasing agricultural and rural enterprise productivity and rural tourism. 6. Ensure security of land tenure to encourage investments, and address bottlenecks in land management and titling agencies. 7. Invest in human capital development, including health and education systems, and match skills and training to meet the demand of businesses and the private sector. 8. Promote science, technology, and the creative arts to enhance innovation and creative capacity towards self-sustaining, inclusive development. 9. Improve social protection programs, including the government's Conditional Cash Transfer program, to protect the poor against instability and economic shocks. 10. Strengthen implementation of the Responsible Parenthood and Reproductive Health Law to enable especially poor couples to make informed choices on financial and family planning.
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<p>A. Poverty Reduction Studies</p> <p>The University works with the paradigm that the poverty issue is multi-dimensional and is driven by multifarious causes. Poverty studies therefore should cover the many facets of the causes and effects of poverty as well as the ways of addressing them. They should also be linked with peace and security concerns of localities, regions and countries. The studies should reveal the relationships of poverty to security, human rights, governance, lack of education, and limited access to social services for according to Kofi Annan, "development cannot be enjoyed without security and security cannot be enjoyed without development."</p> <p>Roles and models on local resource and local actors' mobilization, increasing productivity and creativity, community-driven development, and development partnerships between public and private</p>	<p>the national and local government, business community, civil society, and other linkages by sharing expertise of faculty, staff and students of the University;</p> <p>5. Commit itself for the development of faculty and employees with the highest level of professionalism;</p> <p>6. Develop among students the value of productivity, creativity, and innovation in their chosen fields of specialization;</p>	<p>meet desired needs and requirements under various constraints.</p> <p>IT06 - Integrate IT-based solutions into the user environment effectively.</p> <p>d. Modern Tool Usage;</p> <p>IT07 - Apply knowledge through the use of current techniques, skills, tools and practices necessary for the IT profession.</p> <p>e. Individual and Team Work;</p> <p>IT08 - Function effectively as a member or leader of a development team recognizing the different roles within a team to accomplish a common goal.</p> <p>IT09 - Assist in the creation of an effective IT project plan.</p> <p>f. Communication;</p> <p>IT10 - Communicate effectively with the computing community and with society at large about complex computing activities through logical writing, presentations, and clear instructions.</p> <p>g. Computing Professionalism and Social Responsibility;</p> <p>IT11 - Analyze the local and global impact of computing information technology on</p>	<p>CHED NATIONAL HIGHER EDUCATION RESEARCH AGENDA - 2 (2009-2018)</p> <p>NHERA-2 shall support the higher education sector's goals to develop high level and globally competitive workforce, generate/transfer knowledge, and technology for enhancing productivity and quality of life in order to reduce poverty and ensure sustainable development in the country.</p> <p>The following objectives shall be pursued under NHERA-2:</p> <ol style="list-style-type: none"> 1. Improve research capability of HEIs, particularly the Philippine universities whose main business is to generate knowledge towards international competitiveness. 2. Enhance research productivity of HEIs in distinctive areas of competence. 3. Generate knowledge/technologies needed for a. International, national and regional higher education development, b. policy/plan formulation, particularly for higher education c. developing innovative programs in cutting edge higher education fields (e.g., nanotechnology, biotechnology, information and communications technology, and materials science); and advancing the frontiers of knowledge in the disciplines. 4. Promote and facilitate dissemination and utilization of research outputs.
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<p>sector should likewise be included among the focus of poverty studies.</p> <p>The following research topics are herein identified for poverty reduction according to different dimensions:</p> <p>(1) Economic Dimension</p> <p>a. Agrarian reform and industrialization</p> <p>b. Agri-business</p> <p>c. Corporate social responsibility</p> <p>d. Employment and industrial relations</p> <p>e. Growth and equity</p> <p>f. Local/community and distributive economics</p> <p>g. Micro-finance/micro lending strategies</p> <p>h. National and local economic policies</p> <p>i. SMEs, cooperatives and social enterprise</p> <p>j. Supply chain management, and</p> <p>k. Other related topics</p> <p>(2) Educational Dimension</p>	<p>7. Enhance the culture of collaborative research among faculty, employees and students;</p> <p>8. Participate actively in national and international research fora and publication of research outputs in recognized journals;</p> <p>9. Envision to build self-sustaining communities through GAD-sensitive approach and research-based extension activities for business, education,</p>	<p>individuals, organizations, and society.</p> <p>IT12 - Understand professional, ethical, legal, security and social issues and responsibilities in the utilization of information technology.</p> <p>h. Life-Long Learning;</p> <p>IT13 - Recognize the need for and engage in planning self-learning and improving performance as a foundation for continuing professional development.</p> <p>Lifted from: https://www.pacu.org.ph/wordpress/wp-content/uploads/2017/06/CMO-No.25-s2015.pdf</p>	<p>Priority Research Areas in Information Technology</p> <ul style="list-style-type: none"> • Developmental study on System Software Development Transactional Processing (SSD TPS) • Artificial Intelligence/Executive System (AI/ES) • Computer Aided Instruction (CAI) • Management Information System (MIS) • Decision Support System (DSS) <p>DOST National Integrated Basic Research Agenda (NIBRA) 2017-2022</p> <p>For 2017-2022, the NRCP's National Integrated Basic Research Agenda (NIBRA) will prioritize fundamental research in support of the Philippine Development Plan, the National Security Plan, and the Science for Change Program led by the Department of Science and Technology</p> <p>The National Research Council of the Philippines (NRCP), a collegial body of over four thousand researchers, scientists, and experts, is mandated to promote and support fundamental and basic research in the country as provided in the 9th Philippine Legislature Act No. 4120 passed on 8 December 1933. It is likewise mandated to provide advice on problems and issues of national interest.</p> <p>Along this line, the NRCP supports research that is directed primarily towards developing a new and fuller scientific knowledge or understanding of any subject which may or may not have practical applications. Basic research results from intellectual curiosity aimed at proving the unknown, or it may seek new</p>
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<ul style="list-style-type: none"> a. Academe-industry linkages b. Alternative learning system c. Curriculum Development d. Distance education/learning e. Educational policies and legislation f. Educational technology and innovation g. Graduate tracer study h. Home-School-Community collaboration i. Institutional Development j. Outcome-based education k. Professional development and faculty support l. Quality assurance m. Student support services n. Teacher and student achievements o. Transformative education p. Transnational education (ASEAN integration), and q. Other related topics 	<p>information technology, and office administration programs;</p> <p>10. Observance of FOI, e-governance, transparency, and accountability in all aspects of branch operation and services.</p>		<p>knowledge required for practical application in the future (Ref: Science Act of 1958 as amended by RA 3589).</p> <p>It has six issues based NIBRA programs, namely:</p> <ul style="list-style-type: none"> A. Water Security – TUBIG Program (Tubig ay Buhayin at Ingatan) B. Food and Nutrition Security – SAPAT Program (Saganang Pagkain Para sa Lahat) C. Health Sufficiency – LIKAS Program (Likas Yaman sa Kalusugan) D. Clean Energy – ALERT Program (Alternative Energy Research Trends) E. Sustainable Community – SAKLAW Program (Saklolo sa Lawa) F. Inclusive Nation-building – ATIN program (Ang Tinig Natin) <p>Among these six, the top three priority areas for 2017-2019 are SAKLAW, ATIN, and LIKAS Programs. Outputs of NRCP-funded research are journal and scholarly publications, policy advisories, patent applications, and products used for community and public engagements such as books, manuals, monographs, among others.</p> <p>The NIBRA is a product of a series of consultations and forums which started in 2016. The divisions’ basic research agenda were further harmonized by the NRCP clusters before the NIBRA was approved by the Governing Board and confirmed by the General Membership Assembly.</p> <ul style="list-style-type: none"> A. Water Security <ul style="list-style-type: none"> TUBIG Program (Tubig ay Buhayin at Ingatan) 1. Watershed studies <ul style="list-style-type: none"> a. Biological, chemical and physical characterization b. Water supply stress index c. Population growth impacts on water resource availability 2. Water quality, accessibility and availability
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<p>(3) Social, Political and Cultural Dimension</p> <ul style="list-style-type: none"> a. Good governance b. Human development and social protection c. Informal settlers d. Knowledge and belief systems e. Local government studies f. Public personnel management and development g. Public-private partnership h. Quality of life i. Social welfare, and j. Other related topics <p>(4) Public Health Dimension</p> <ul style="list-style-type: none"> a. Food sufficiency b. Food productivity c. Nutrition and dietatics d. Food sciences, and e. Other related topics <p>B. Peace and Security Studies</p>			<ul style="list-style-type: none"> a. Pollutants/contaminants (surface and ground waters) b. Analysis of historical flows, sediment and toxicity loads of lakes and rivers c. Weather modification for increasing water supplies in special localized areas <p>Priorities for 2017-2019</p> <p>Ensuring an adequate supply of quality water that is accessible to a growing population is TUBIG Program's priority for 2017-2019. Specific topics include:</p> <ul style="list-style-type: none"> a. Characterization of water resources (ground water) b. Impact of various climate change scenarios on water supply <p>Priorities for 2020-2022</p> <p>Studies on rivers, reservoirs, dams and other surface water resources will be the priority for 2020-2022 which will include:</p> <ul style="list-style-type: none"> a. Characterization of water resources (surface water) b. Impact of various climate change scenarios on water supply <p>B. Food and Nutrition Security</p> <p>SAPAT Program (Saganang Pagkain Para sa Lahat)</p> <ul style="list-style-type: none"> 1. Biodiversity studies <ul style="list-style-type: none"> a. Biological Pollution b. Biology and population dynamics of pests, diseases, and natural enemies c. Taxonomy of flora and fauna d. Environmental scanning of physical marine and terrestrial resources (Taxonomy, systematics, ecology) e. Genetic analysis (biochemical, cytogenetics, molecular) f. Taxonomy of eco-friendly species (e.g., arthropods and microorganisms) for Integrated Pest Management g. Exploring allelopathic potentials of indigenous botanicals. 2. Food safety
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<p>Peace and security studies and researches are expected (1) to understand the causes of armed conflicts, religious disagreements, cultural clashes, war, terrorism, genocide, human violations and others; (2) to develop ways and devices to prevent and resolve identified peace and security problems; and ultimately (3) to build peaceful and just communities, systems, and societies.</p> <p>Obviously, these types of studies require interdisciplinary approaches and expertise. Henceforth, researches with the following topics could meet the above expectations:</p> <p>(1) Understand the causes of armed conflicts, religious disagreements, cultural clashes, war, terrorism, genocide, human rights violations and others with focus or emphasis on:</p> <p>a. Democratization b. Ethnographic and ethnicity studies</p>			<p>a. Safety analysis of food supplements and cosmeceuticals in the market</p> <p>b. Livestock and poultry diseases (epidemiological studies, re-emerging and emerging diseases)</p> <p>c. Diseases and pathogens of important crops</p> <p>d. Identification and characterization of food/feed contaminants</p> <p>e. Epidemiology of food- and feed-borne contaminants</p> <p>Priorities for 2017-2019 Basic research along two strands is SAPAT Program's priority in the next three years.</p> <p>a. Taxonomy and systematics of flora and fauna for food. Specific topics include genetic analysis, morphological analysis and allelopathic analysis.</p> <p>b. Safety analysis of cosmeceuticals and food supplements. Specific topics include. epidemiology, microbiology, chemical analysis, cost-benefit and socio-economic studies.</p> <p>Priorities for 2020-2022 There will be the same priorities in 2020-2022, but focus will be on:</p> <p>a. Bio-ecology studies of flora and fauna for food</p> <p>b. Safety analysis of raw and processed food products</p> <p>C. Health Sufficiency</p> <p>LIKAS Program (Likas Yaman sa Kalusugan)</p> <p>1. Fundamental Studies on Potential Sources of Natural Products</p> <p>a. Bioprospecting (e.g., marine organisms for biomedical use)</p> <p>b. Bioinformatics</p> <p>c. Characterization and structure elucidation of plants or foods/food components</p> <p>d. Pharmacogenomics and toxicogenomics</p>
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<p>c. Human growth and development d. International relations and trans-border issues e. Internationalization f. Knowledge and belief systems g. Macroeconomics and globalization issues h. Migration i. National and human security j. Policy studies k. Political dynamics l. Religion and philosophy m. Social issues n. Social movements o. World politics, and p. Other related topics</p> <p>(2) Develop ways to prevent and address identified peace and security problems, through conduct of studies on:</p> <p>a. Behavioral and psychosocial researches b. Cross-cultural communication c. Ethno-linguistics d. Organizational and development communication</p>			<p>2. Basic Veterinary Studies</p> <p>a. Economically important animal diseases and those transmitted to humans. b. Characterization, isolation and bioassay of novel antimicrobial compounds from indigenous sources and plant species c. Herbal veterinary pharmacopeia d. Identification and characterization of zoonotic diseases</p> <p>3. Social Dimensions on Health</p> <p>a. Filipino perceptions and concepts on health b. Herbal and folkloric medicine c. Models for good governance in health management</p> <p>Priority for 2017-2019 Fundamental studies on potential sources of natural products in various ecosystems such as marine sediments, rivers, and rare environments (e.g. caves, mangroves, mined out areas, mesophotic reefs) is the priority of the LIKAS Program. This primarily includes. bio-prospecting studies for medicinal applications with focus on marine ecosystems in 2017-2019.</p> <p>For the basic veterinary studies, priority will be on zoonotic diseases.</p> <p>Priority for 2020-2022 The same type of studies will be prioritized in 2020-2022, but focus will be on the other types of ecosystems, specifically rare environments as potential sources of natural products for medicinal use.</p> <p>For basic veterinary studies, research will focus on other economically important diseases.</p> <p>D. Clean Energy</p>
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<p>e. Peace and conflict resolution f. Psycho-trauma and crisis intervention g. Translation studies, and h. Other related topics</p> <p>(3) Build peaceful and just communities, systems and societies, exploring:</p> <p>a. Access, equity and ethics b. Community empowerment c. Differently-abled (PWDs) d. Gender and development studies e. Globalization of education and cross-cultural aspects f. Institutional development g. Lesbian, Gay and Bisexual, Transsexual and Queer (LGBTQ) issues h. Marriage and family i. Senior citizens' issues j. Women and children, and k. Other related topics</p> <p>Agenda 2: Accelerating Infrastructure Development</p>			<p>ALERT Program (Alternative Energy Research Trends)</p> <p>1. Alternative Energy</p> <p>a. Identification and characterization of alternative sources of energy (wind, solar, biofuels, hydro)</p> <p>Priority for 2017-2019 In the next three years, NRCP will support the conduct of resource assessments of potential alternative sources of energy.</p> <p>Priority for 2020-2022 By 2020, priority will be on conduct of commercial viability studies of the potential. alternative sources of energy identified from previous studies.</p> <p>E. Sustainable Communities SAKLAW Program (Saklolo sa Lawa)</p> <p>1. Vulnerable Ecosystems</p> <p>a. Lakes, rivers, and wetlands b. Oceans and marine studies c. Soil science d. Carrying capacity models of ecosystems.</p>
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through Science and Technology

Consistent with the National Government's thrust, the University is determined to effect significant economic growth, human development, and social protection through acceleration of infrastructure development.

Undoubtedly, infrastructure development is one of the major priorities of the national government as it is clearly and concretely outlined in the recent National Economic and Development Authority agenda. The University, in support to the government's efforts, provides the country with research-based studies and scientific and engineering innovations that will enable both the government and private sectors to hasten infrastructure development which can be both hard and soft infrastructures.

The "hard" infrastructure refers to the large physical networks

- e. Environmental scanning of physical marine and terrestrial resources
- f. Endangered species
- g. Economic valuation of ecosystems, natural capital, and cost-benefit analyses
- h. Evaluation of adaptive socio-ecological systems in a changing environment
- i. Assessment studies on the resource sustainability of various ecosystems
- j. Models and frameworks for enhancing adaptive capacities of vulnerable communities.
- 2. Data Analytics of Natural Phenomena
 - a. Database of pollutants present in abandoned mined out areas (terrestrial and aquatic)
 - b. Computational and numerical modelling and simulations for ecological processes
 - c. Simulations for applications in physical and life sciences, and in complex systems
 - d. Regional climate modelling and sensitivity analysis
- 3. Environment and Anthropogenic Activities
 - a. Geogenic health hazards
 - b. Processes in heavy metals sequestration from mine tailings, agriculture, farms, etc.
 - c. Impact studies of anthropogenic activities on the environment (e.g., mining and resource extractive industries)
 - d. All-systems risk modelling for DRR/CCA
 - e. Human dimensions research on climate change (drivers, impact, responses, adaptive capacities)
 - f. Risk assessment of mining wastes and effluents
 - g. Bioremediation studies

<p>necessary for the functioning of a modern industrial nation; these are meant to support the drivers of economic growth such as tourism, agriculture and industry. On the other hand, "soft" infrastructure refers to all the institutions or systems which are required to maintain the economic, cultural and social standards of a country; these are meant to provide the necessary services for human development and social protection such as education, health, among others.</p> <p>The University identified the following areas and topics to concentrate on:</p> <p>A. Hard Infrastructures</p> <ul style="list-style-type: none"> a. Energy-related infrastructure and facilities (e.g., power sources, upgrade of existing power plants, etc.) b. Flood control and management c. Irrigation systems d. Mechatronics e. Resettlement frameworks f. Structural engineering g. Transportation technology 			<p>SAKLAW Program is the topmost priority of NRCP for 2017-2019 and it will focus on the following topics:</p> <ul style="list-style-type: none"> a. Lake assessment studies -- carrying capacity models and metrics; water quality parameters and baseline studies; resource assessment and valuation; resource utilization and management; socio-economic and policy studies. Both big lakes and small lakes in the country will be included in the program. b. Coastal vulnerabilities -- risk assessment; geohazard mapping; adaptive capacities; marine geology; computational and numerical modelling. The focus will be on DENR-identified highly vulnerable ecosystems. c. Resource extractive industries – fundamental studies of all types of mining areas d. Similar types of basic research will be supported but the focus will be on rivers and other bodies of water, and other ecosystems. e. Inclusive Nation-Building <p>ATIN program (Ang Tinig Natin)</p> <ul style="list-style-type: none"> 1. Data Collection and Analysis of Social Phenomena <ul style="list-style-type: none"> a. Computational and numerical modelling and simulations for social processes b. Indigenous knowledge systems and practices on DRR and CCA c. Gender in nation-building and DRR/CCA 2. Documentation of Indigenous Knowledge <ul style="list-style-type: none"> a. Documentation of traditional health practices in the Philippines b. Extant cultural heritage of ethnolinguistic groups c. Dictionary of cultural metaphors <p>HNRDA 2017-2022 Page 15</p> <ul style="list-style-type: none"> d. Retrieval and documentation of indigenous technology in Filipino expressive culture
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<p>h. Urban and rural housing i. Urban gardening j. Water supply and treatment facilities, and k. Other related topics</p> <p>B. Soft Infrastructures</p> <p>a. Bioinformatics b. Computational and theoretical science c. Data engineering and ubiquitous computing d. E-governance e. Instrumentation research f. Internet and Web applications development g. Knowledge management h. Management information systems/reporting systems i. Material science research j. Mathematical and statistical modelling, k. Mobile computing systems, l. Natural products, m. Network security and issues, n. Pure and applied mathematics research, o. Software development and applications, and p. Other related topics.</p>			<p>e. Documentation of indigenous sustainable farming, fishing, and aquaculture practices f. Early human life and civilization in the Philippines</p> <p>3. Education</p> <p><i>a. Pedagogies in Philippine educational system</i> <i>b. Mathematics, language, music in indigenous Filipino expressive culture</i> <i>c. K12 studies</i></p> <p>4. National Security and Sovereignty</p> <p><i>a. Peace studies and conflict resolution</i> <i>b. Sovereignty issues</i> <i>c. Human security (community, political, health, economic, environmental, personal)</i></p> <p>5. Arts, History and Culture</p> <p>a. Extant cultural heritage of ethnolinguistic groups b. Filipinovation in music, theatre, dance, literature, performing arts. c. Codification of endangered Philippine languages</p> <p>ATIN Program is the second priority for 2017-2019. Among the five themes abovementioned, the topmost priority will be:</p> <p>a. Documentation of indigenous knowledge (art and art forms, practices, technologies, early human life and civilization in the Philippines) b. National security and sovereignty -- to include studies on internal conflict and peace, human security as well as maritime and geopolitical studies. Priority for 2020-2022 For 2020-2022, the same topics will be supported in addition to new developments that may arise.</p>
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Agenda 3: Competitive Industry and Entrepreneurship

The university recognizes the country's need to strengthen the competitiveness of its industries particularly those which are driving the nation forward in terms of economic growth such as tourism, agriculture, skilled manpower in ICT and language proficiency, retail, exports, investments, banking and entrepreneurship.

Furthermore, PUP is one with the National Government in its objective of assuring rapid and sustained growth for the country. In view of this, the University, with its various academic and research arms, identifies important research topics and areas which can be explored (1) to reveal important trends, issues and challenges confronting these industries and (2) to discover devices and ways to address these challenges. The

For all the NIBRA programs, basic research on the cross-cutting themes of gender, KAPS (knowledge, attitude, practices, skills), policy studies, valuation and cost benefit-analysis, impact studies, and DRR/CCA dimensions will be considered.

Calabarzon Region 4A Development Plan

<https://calabarzon.neda.gov.ph/wp-content/uploads/2017/10/Calabarzon-RDP.pdf>

Subsector Outcome 3: Access to technology increased

- a. Raise investments in R&D for production and post-harvest technologies.
- b. This aims to reduce losses, maintain quality and food safety, and increase the value of agricultural and fishery commodities (e.g., ice-making and storage technologies).
- c. Investments will be increased to cover the direct cost for R&D, build a critical mass of human resources and improve.

National Economic and Development Authority (NEDA) Research Agenda - AMBISYON 2040

Filipinos are strongly rooted: Matatag, Filipino families live together; there is work-life balance so that there is time to spend with family even for members who work. On weekends, families and friends enjoy time together in parks and recreational centers. It is a high-trust society with a strong sense of community. There are volunteer opportunities, and Filipinos spend time to serve the community, help others who are in need, and contribute to various causes.

<p>following research topics are hereunder identified:</p> <ul style="list-style-type: none"> a. Business processing and outsourcing b. Cooperative Management c. E-commerce d. Human resource management practices and issues e. Incubation and commercialization f. Industry needs analysis g. Investments and banking systems and operations h. Livelihood and business development i. Management and organization j. Market for agriculture industry k. Micro and macroeconomics l. National and local economic policy research (NEDA, LGU projects, DTI) m. Product development and innovation n. Quality management o. Resource management 			<p>Filipinos are comfortable: Maginhawa, No one is poor, no one is ever hungry. Filipino families live in comfortable homes with the desired amenities and secure tenure. Families and friends are within reach because transport is convenient and affordable, and they can take a vacation together within the country and abroad. Children receive quality education so that they realize their full potential and become productive members of society. Decent jobs that bring sustainable income are available, including opportunities for entrepreneurship.</p> <p>Filipinos are secure: Panatag, Filipinos feel secure over their entire lifetime. They expect to live long and enjoy comfortable life upon retirement. There are resources to cover unexpected expenses, and there are savings. They feel safe in all places in the country. Filipinos trust their government because it is free of corruption and provides service to all its citizens equally.</p>
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- p. Small and medium enterprises (SMEs)
- q. Work values, and
- r. Other related topics

Agenda 4: Social and Cultural Development

Culture and society are linked to each other. Generally, culture is an important element of social development. The University, with its strong academic/research centers and institutes pertaining to cultural and social studies, is bent to support the National Government in the (1) creation of intellectual potential; (2) building of human capital; (3) popularization of culture, arts and heritage; (4) forging social integration; (5) promotion of national identity through local and national historiography; (6) prevention of social pathologies; (7) initiation and establishment of cooperation; (8) advancement and promotion of national solidarity and patrimony; and (9) reduction of disproportions of personal development of



citizens as a form of social advancement.

The following research topics are identified in order to direct the University research activities along the line of cultural and social development:

- a. Communication and society
- b. Filipino worldview
- c. Filipino culture
- d. Heritage studies/ intangible cultural heritage/ heritage preservation
- e. Historiography
- f. Human growth and development studies
- g. Information campaign and evaluation, advertising/public relations principles and case studies
- h. Literature, performing arts, visual arts, folk arts
- i. Media laws and ethics
- j. Media literacy
- k. Organizational behavior, multiple intelligences, giftedness and learning disabilities.



- l. Philosophical studies
- m. Popular culture
- n. Psychology and society
- o. Sociological studies,
and
- p. Other related topics

Agenda 5: Environmental Conservation, Protection and Rehabilitation towards Sustainable Development

Conservation, protection and rehabilitation of the environment is a significant factor in the maintenance of community's sustainability. It includes the sustainable use and management of the natural resources such as water, natural energy, air, wildlife, and minerals. The University recognizes this as a very important element of national development.

The following research areas and topics have been identified to generate knowledge to supplement the existing body of works regarding the management, care, use and

<p>exploitation of the natural resources:</p> <ul style="list-style-type: none">a. Biodiversityb. Climate change mitigation and adaptationc. Disaster management, preparedness and monitoringd. Energy conservatione. Environmental conservation, preservation, protection and stewardshipf. Global warmingg. Urban ecology, andh. Other related topics			
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Likewise, all research capability-building activities designed for the faculty and students should gear towards the achievement of the research agenda.



