



PANGASINAN STATE UNIVERSITY SAN CARLOS CITY Campus

BS INFORMATION TECHNOLOGY

2nd Semester, S.Y 2021 – 2022

COURSE SYLLABUS

COURSE INFORMATION

COURSE CODE	NET101
COURSE TITLE	NETWORK 1 (FUNDAMENTALS OF NETWORKING)
COURSE CREDIT	3.0 (2 Lec/1 Lab)
CLASS HOURS	90 hours
COURSE PREREQUISITE	CC 101 - Introduction to Computing
COURSE SCHEDULE	Monday – Tuesday 8:00 – 2:00

UNIVERSITY VISION, MISSION, QUALITY POLICY, INSTITUTIONAL OUTCOMES AND PROGRAM OUTCOMES

UNIVERSITY VISION	To become an ASEAN Premier State University by 2025.
UNIVERSITY MISSION	The Pangasinan State University, through instruction, research, extension and production, commits to develop highly principled, morally upright, innovative and globally competent individuals capable of meeting the needs of industry, public service and civil society.
QUALITY POLICY	<p>The Pangasinan State University shall be recognized as an ASEAN premier state university that provides quality education and satisfactory service delivery through instruction, research, extension and production.</p> <p>We commit our expertise and resources to produce professionals who meet the expectations of the industry and other interested parties in the national and international community.</p> <p>We shall continuously improve our operations in response to changing environment and in support of the institution's strategic direction.</p>
INSTITUTIONAL OUTCOMES	<p>The Pangasinan State University Institutional Learning Outcomes (PSU ILO) are the qualities that PSUnians must possess. These outcomes are anchored on the following core values: Accountability and Transparency, Credibility and Integrity, Competence and Commitment to Achieve, Excellence in Service Delivery, Social and Environmental Responsiveness, and Spirituality – (ACCESS).</p> <p>Anchored on these core values, the PSU graduates are able to:</p> <ol style="list-style-type: none"> 1. Demonstrate through institutional mechanisms, systems, policies, and processes which are reflective of transparency, equity, participatory decision making, and accountability; 2. Engage in relevant, comprehensive and sustainable development initiatives through multiple perspectives in decisions and actions that build personal and professional credibility and integrity. 3. Set challenging goals and tasks with determination and sense of urgency which provide continuous improvement and producing quality outputs leading to inclusive growth;

4. Exhibit life-long learning and global competency proficiency in communication skills, inter/interpersonal skills, entrepreneurial skills, innovative mindset, research and production initiatives and capability in meeting the industry requirements of local, ASEAN and international human capital market through relevant and comprehensive programs;
5. Display, socially and environmentally responsive organizational culture, which ensures higher productivity among the university constituents and elevate the welfare of the multi-sectoral communities and;
6. Practice spiritual values and morally upright behavior which promote and inspire greater harmony to project a credible public image.

PROGRAM OUTCOMES

GRADUATE ATTRIBUTES	PROGRAM OUTCOMES	PERFORMANCE INDICATORS
Knowledge for solving computing problems	PO 1. Apply knowledge of computing, science, and mathematics appropriate to the discipline;	<ol style="list-style-type: none"> 1. Identify or determine the techniques, tools, methodologies to be used given a particular scenario that involves computing, science, and mathematics 2. Compare different tools, techniques, methodologies as to their pros and cons that will help in decision making
	PO 2. Understand best practices and standards and their applications	<ol style="list-style-type: none"> 1. Identify the characteristics that conform to standards and their best practices. 2. Compare and contrast tools and methodologies in terms of best practices, standard and their application
Problem analysis	PO 3. Analyze complex problems, and identify and define the computing requirements appropriate to its solution	<ol style="list-style-type: none"> 1. Analyze complex problems 2. Identify and define the complexity requirements appropriate to its solution.
	PO 4. Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based Systems	<ol style="list-style-type: none"> 1. Analyze the user's needs and take them into account in the selection, creation, evaluation and administration of computer-based systems. 2. Identify the user's requirements and take them into account in the selection, creation, evaluation and administration of computer-based systems. 3.
Design, development of solutions	PO 5. Design, implement, and evaluate computer-based systems, processes, components, or programs to meet desired needs and requirements under various constraints	<ol style="list-style-type: none"> 1. Translate specification into a design 2. Design software to meet desired needs under various constraint 3. Design a database to meet desired needs for storing data under various constraints 4. Design networks to meet desired needs for sharing information under various constraints 5. Design a hardware infrastructure to meet desired processing needs under various constraints 6. Implement a network to meet desired needs for sharing information under various constraint 7. Implement database to meet desired needs for storing data under various constraint 8. Implement a software to meet desired needs for task under various constraints 9. Evaluate software on its functionality and level of satisfying user requirements for task under various constraint 10. Evaluate an existing network for its level of satisfying user requirements for under various constraint
	PO 6. Integrate IT-based solutions into the user environment effectively	<ol style="list-style-type: none"> 1. Implement a network to meet desired needs for sharing information under various constraint 2. Implement database to meet desired needs for storing data under various constraint 3. Implement a software to meet desired needs for task under various constraints 4. Evaluate software on its functionality and level of satisfying user requirements for task under various constraint

			5. Evaluate an existing network for its level of satisfying user requirements for under various constraint
	Modern Tool Usage	PO 7. Apply knowledge through the use of current techniques, skills, tools and practices necessary for the IT profession	<ol style="list-style-type: none"> 1. Evaluate techniques, methodologies, standards/frameworks and tools for its appropriateness to the IT Infrastructure to be designed and managed considering its advantages and limitations. 2. Select, use and adapt appropriate techniques, methodologies, standards/frameworks and tools the IT Infrastructure to be designed and managed. 3. Create new IT Infrastructure as necessary to improve the efficiency and effectiveness of performing tasks and achieve goals
	Individual and Team Work	PO 8. Function effectively as a member or leader of a development team recognizing the different roles within a team to accomplish a common goal	<p>Team member:</p> <ol style="list-style-type: none"> 1. Independently source necessary knowledge, assistance, skills and resources to complete tasks. 2. Performs tasks effectively to accomplish a common goal <p>Leader of a team:</p> <ol style="list-style-type: none"> 3. Set proper goals and timeline of activities to complete team objectives 4. Allocate task according to team member capabilities 5. Monitor task completion and performance of team member 6. Provide expertise, assistance and support to team members to achieve of team goals 7. Resolve and reduce conflicts within the team
		PO 9. Assist in the creation of an effective IT project plan	<ol style="list-style-type: none"> 1. Perform task in the creation of an effective IT project plan 2. Create an effective IT project plan
	Communication	PO 10. Communicate effectively with the computing community and with society at large about complex computing activities through logical writing, presentations, and clear instructions	<ol style="list-style-type: none"> 1. Interview clients to gather background information, situation, existing concerns and issues necessary to frame and achieve common understanding of problems to be addressed by computing solutions 2. Write effective reports and documentations about the results of performing specific computing and professional tasks 3. Write documentations (including design documentations) completely and comprehensively, with appropriate tone, correct grammar and construction, adapting to documentation standards, to communicate ideas, choices, assumptions, and consequences of decisions 4. Develop effective presentation material that will enhance understanding of ideas being communicated 5. Deliver presentations effectively and efficiently to various audience (computing community, society at large, and users) using English and Filipino as needed, with appropriate tone, correct grammar and construction 6. Choose appropriate language suitable to the audience and respectful to the audience background and culture 7. Provide clear instructions to team members
	Computing Professionalism and Social Responsibility	PO 11. Analyze the local and global impact of computing and information technology on individuals, organizations, and society	<ol style="list-style-type: none"> 1. Analyze the local impact of computing and information technology on individuals, organizations, and society 2. Analyze the global impact of computing and information technology on individuals, organizations, and society 3. Make design and implementation decision considering the impact of IT on individuals, organizations, and society 4. Provide /conceptualize solutions to domain where IT is needed 5. Evaluate the impact of this solutions to individuals, organizations, and society

		PO 12. Understand professional, ethical, legal, security and social issues and responsibilities in the utilization of information technology	<ol style="list-style-type: none"> 1. Make decisions considering professional, ethical, legal, security and social issues and responsibilities in the utilization of information technology 2. Assess professional, ethical, legal, security and social issues and responsibilities in the utilization of information technology
	Life-Long Learning	PO 13. Recognize the need for and engage in planning self-learning and improving performance as a foundation for continuing professional development	<ol style="list-style-type: none"> 1. Reflect on own abilities and skills to determine necessary development needs to reach level of expectations and aspirations as a computing professional 2. Prepare a personal development plan for continuing professional development 3. Engage independently in developmental activities (like participating in professional organizations, attendance to seminars and training) as a result of recognizing the need to further and continuously develop one's competencies as a computing professional 4. Evaluate achievements and deficiencies against own's personal development plan

COURSE DESCRIPTION

This course introduces the concept of data communication and computer networking. such as protocols, topologies, hardware, and network operating systems. It then provides coverage of the most important concepts such as TCP/IP, Ethernet, wireless transmission, and security. The course will prepare the students to select the best network design, hardware, and software for their environment. They will also have the skills to build a network from scratch and maintain, upgrade, and troubleshoot an existing network.

COURSE OUTCOMES

COURSE OUTCOMES (CO)	PROGRAM OUTCOMES CODE (PO)
CO 1. Independently understand basic computer network technology.	PO1, PO2
CO 2. Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.	
CO 3. Understand and building the skills of subnetting and routing mechanisms.	PO1, PO4
CO 4. Analyzes various types of configurations and upgrading	
CO 5. Plan and design a network infrastructure	PO6, PO7, PO9

COURSE LEARNING PLAN

Course Outcome/s	Learning Outcomes	Topics	Hours	Learning Activities (Face-to-Face and Remote Teaching)	Learning Materials and Platform	Assessment
	Advocate and process the VMGO of the university Be familiar with the rules and policies of the university	Vision, Mission, Goals, Core Values Course Orientation	1		VMGO Core Values Presentation	

CO1, CO2	<ul style="list-style-type: none"> Define computer networking. Enumerate the different advantages of computer network. Explain the different components of computer network. 	I. Basics of Computer Networking <ul style="list-style-type: none"> What is a Computer Network? Advantages of a Computer Network Computer Network Components Unique Identifiers of Network Other Important Network Components Uses of Computer Networks Disadvantages of using Computer Networks 	3	Remote Learning / Module Online Class	Learning Materials: Module E – book Book Web – linked Platform: Official Virtual Classroom Social Media	Quiz Interactive Discussion Homework
CO1, CO2	<ul style="list-style-type: none"> Enumerate and describe the different types of computer network and its implementation. 	II. Types of Computer Network <ul style="list-style-type: none"> Important Types of Computer Networks PAN (Personal Area Network) LAN WAN MAN Other Types of Networks 	3	Remote Learning / Modular Online Class	Learning Materials: Module E – book Book Web – linked Platform: Official Virtual Classroom Social Media	Quiz Interactive Discussion Homework Activities/Works
CO1, CO2	<ul style="list-style-type: none"> Explain and compare the different topologies. 	III. Network Topology <ul style="list-style-type: none"> Types of topology How to select a network topology 	3	Remote Learning / Modular Online Class	Learning Materials: Module E – book Book Web – linked Platform: Official Virtual Classroom Social Media	Quiz Interactive Discussion Homework Activities/Works
CO1, CO2	<ul style="list-style-type: none"> Explain the function of each layer of the OSI (Open Systems Interconnection) model Describe the application protocols that use the services of other layers. 	IV. OSI Model <ul style="list-style-type: none"> History of OSI Model Characteristics of OSI Model 7 Layers of the OSI Model Interaction Between OSI Model Layers Protocols supported at various levels Advantages and Disadvantages of the OSI Model 	15	Remote Learning / Modular Online Class	Learning Materials: Module E – book Book Web – linked Platform: Official Virtual Classroom Social Media	Quiz Interactive Discussion Activities/Works

CO1, CO2	<ul style="list-style-type: none"> Identify protocols and standards in the Internet. Describe the TCP/IP protocol suite. Describe the services at the IP (Internet Protocol) layer. 	V. TCP/IP Model <ul style="list-style-type: none"> TCP Characteristics Four Layers of TCP/IP model The Network Interface Layer Differences between OSI and TCP/IP models Most Common TCP/IP Protocols Advantages and Disadvantages of the TCP/IP model 	15	Remote Learning / Modular Online Class	Learning Materials: Module E – book Book Web – linked Platform: Official Virtual Classroom Social Media	Quiz Interactive Discussion Homework Activities/Works
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MIDTERM EXAMINATION

CO1, CO2, CO4, CO5	<ul style="list-style-type: none"> Describe Internet addressing. Understand how IP addresses are assigned and used Name the addressing scheme widely used at network layer; 	VI. IP Address <ul style="list-style-type: none"> Types of IP address Types of Website IP Addresses IP Address Classification Based on Operational Characteristics IP Packet Header IP Packet Classes 	20	Remote Learning / Modular Online Class	Learning Materials: Module E – book Book Web – linked Platform: Official Virtual Classroom Social Media	Hands-on Demo Laboratory Laboratory Activity Project Presentation
CO1, CO2, CO5	<ul style="list-style-type: none"> Categorize cable types and their properties Identify common connector types Differentiate and implement appropriate wiring standards 	VII. Cabling <ul style="list-style-type: none"> Straight Through Cables vs Crossover Cables Ethernet Cable types and Categories 	15	Remote Learning / Modular Online Class	Learning Materials: Module E – book Book Web – linked Platform: Official Virtual Classroom Social Media	Hands-on Demo Laboratory Laboratory Activity Project Presentation
CO1, CO2, CO3	<ul style="list-style-type: none"> Identify several ways to classify routing protocols. Describe how metrics are used by routing protocols and identify the metric types used by dynamic routing protocols. Identify the different elements of the routing table. 	VIII. Routing Protocols <ul style="list-style-type: none"> Types of Routing Protocols Purpose of Routing Protocols Routing Protocols Metrics Classful Vs. Classless Routing Protocols 	15	Remote Learning / Modular Online Class	Learning Materials: Module E – book Book Web – linked Platform: Official Virtual Classroom Social Media	Hands-on Demo Laboratory Laboratory Activity Project Presentation

FINAL EXAMINATION

COURSE REFERENCES AND SUPPLEMENTAL READINGS

A. Books

- Ciccarelli, Patrick (2013). Introduction to Networking Basics. 2nd Edition. Wiley.
- Cisco Networking Academy (2016). Introduction to Networks Companion Guide v5.1. 1st edition. Cisco Press PTG
- Robertazzi Thomas G. (2017) Introduction to Computer Networking. Springer.

eBook

- "Computer Networks and Security." *Encyclopedia of Management*, 8th ed., vol. 1, Gale, 2019, pp. 161-168. *Gale eBooks*, link.gale.com/apps/doc/CX7617900058/GVRL?u=phpsu&sid=GVRL&xid=25ffdb6c. Accessed 29 Jan. 2021.
- "Routing." *Computer Sciences*, edited by K. Lee Lerner and Brenda Wilmoth Lerner, 2nd ed., vol. 4: Electronic Universe, Macmillan Reference USA, 2013, pp. 239-241. *Gale eBooks*, link.gale.com/apps/doc/CX2761000302/GVRL?u=phpsu&sid=GVRL&xid=34e895c5. Accessed 29 Jan. 2021.
- "TCP/IP." *Computer Sciences*, edited by K. Lee Lerner and Brenda Wilmoth Lerner, 2nd ed., vol. 4: Electronic Universe, Macmillan Reference USA, 2013, pp. 259-262. *Gale eBooks*, link.gale.com/apps/doc/CX2761000308/GVRL?u=phpsu&sid=GVRL&xid=d96c9acf. Accessed 29 Jan. 2021.
- Network Protocols. (2013). In K. L. Lerner & B. W. Lerner (Eds.), *Computer Sciences* (2nd ed., Vol. 2, pp. 150-154). Macmillan Reference USA.
https://link.gale.com/apps/doc/CX2761000125/GVRL?u=phpsu&sid=GVRL&xid=1dc8c9d9
- Local Area Networks (LANs). (2017). In V. L. Burton, III (Ed.), *Encyclopedia of Small Business* (5th ed., Vol. 2, pp. 687-689). Gale.
https://link.gale.com/apps/doc/CX6062700357/GVRL?u=phpsu&sid=GVRL&xid=d9736cdd

C. Electronic Sources**Website**

- <https://www.guru99.com/data-communication-computer-network-tutorial.html>

COURSE REQUIREMENTS

Case Study

1. The case study will involve a real – life networking scenario which will assess how the student will make sensible choices in terms of network management given certain considerations and constraints

ASSESSMENT AND GRADING

Final grade = $\frac{\text{midterm grade} + \text{final term grade}}{2}$

Midterm grade = 40% midterm exam

30% attendance/recitation/quizzes

30% home-based requirements/online exercises

Final term grade = 40% final exam

30% attendance/recitation/quizzes

30% home-based requirements/online exercises

COURSE POLICIES AND EXPECTATIONS**Lecture Class Policies (Residential Class)**

1. Please wear your face masks at all times. Bring your alcohol, soap, ballpen, paper, and other materials. Strictly no borrowing of things.
2. Please stay home if you are unwell.
3. Attendance in the class signifies readiness to participate in class discussions and activities.
4. A student is responsible for his/her absence.
5. A student will be automatically marked DRP (Dropped) after eight (8) consecutive absences.
6. Requirements must be submitted within the designated date of submission.
7. NO CELL PHONES OR ELECTRONIC DEVICES AT ANY TIME. All school rules will be followed as stated in the student handbook
8. Late work: Deductions will be given however; leniency will be observed.
9. Others (agreed upon by the class)

Lecture Class Policies (Online Class)

1. Wear a decent casual dress during the web conference.
2. No foul words during online discussions.
3. Observe punctuality and courtesy (the group of 5 individuals per batch; usually group leaders)
4. Private conversations during web conferencing are not allowed.
5. Respect shall be observed for the teacher and students
6. Cheating and plagiarism not tolerated
7. On-time submission of requirements as agreed during class orientation

Laboratory Class Policies

1. No laboratory gown; no attendance; no performance of the activity
2. No playing of music
3. No food or drinks allowed in the lab
4. Late work: Deductions will be given however; leniency will be observed.
5. Attendance in the laboratory implies a prior reading of procedures indicated in the manual
6. Cheating on a test or assignment will result in a grade of zero for all involved.
7. Data for lab reports must be taken during the lab. Copying of lab data after the lab is not allowed. Each student is responsible for individual lab reports unless specifically stated by the instructor.

Additional Information:

1. A Microsoft Teams Chat will be created for the subject specifically which will be used for immediately answering queries.
2. A Microsoft Teams group will be created for the posting of announcements, syllabus, assignments, rubrics, directions, laboratory manuals, videos, or links of instructional materials.
3. All assignments shall be submitted to the MS Teams account.
4. All documents and/or photos shall be renamed bearing your name and the activity (e.g. Net_CAR_A1) for purposes of monitoring of submission and on-time passing.

FACULTY CONTACT INFORMATION

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OFFICE LOCATION	MIS Office		
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<u>CHRISTOPHER A. RODRIGUEZ, MACE</u> Faculty	<u>CHRISTIAN S. DELA CRUZ, DIT</u> Chairperson	<u>JULIET V. MENOR, DIT</u> College Dean	<u>MARIE CLAIRE B. BRIONES, Ed.D.</u> Campus Executive Director