



Assessment of DMMMSU-NLUC BSIS Students for Employability on Business Process Outsourcing (BPO): A Basis for Curriculum Enrichment

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ABSTRACT

The research study aimed to determine the performance of the BSIS undergraduate students of the DMMMSU-NLUC under the assessment of the AMCAT exam for employability in Business Process Outsourcing (BPO). Specifically, it determined the BSIS students' profile, performance in various domains, and strengths and weaknesses. Also, the level of employability of the AMCAT takers and a curriculum enrichment program were identified. The secondary data from the College file for the student profile and Aspiring Minds was used in the analysis of the AMCAT Assessment Result and the identification of the strength and weaknesses. The secondary data used frequency and percentage for the profile and mean score for the AMCAT Assessment Result. The results showed that more female BSIS students than males and more graduated from the public than private schools in their secondary education. Additionally, students were more competent in the Basic Computer Literacy, English, and Quantitative Ability areas compared to Office Administration, Logical Ability, Information Gathering and Synthesis, and Internet Ability. Further, the BSIS student takers lack competencies in the employability in the BPO industry as all domains were marked as their weaknesses. The Bachelor of Science in Information Systems Specialized in Service Management Program Track and Specialized in Business Analytics Track with the inclusions of laboratory hours were enriched in the old BSIS curriculum.

Keywords: business process outsourcing, curriculum enrichment, employability

Introduction

The Business Process Outsourcing (BPO) industry offers tremendous career growth for anyone looking to grow their career in a business dedicated to providing service to some of the world's leading technology, communications, and media brands. The business processing industry in Asia has remained optimistic in the past years despite the economic downturn happening across the world. This is because the industry continues to have a positive outlook. The BPO industry offers many advantages. For one, the work schedule allows individuals to be with their family, study during the day, and work in the evening. In addition, service professionals are exposed to many leading global brands and can quickly become well-versed in the industry and/or technology of the client they support (Desiderio, 2015; Errighi et al., 2016; Farrell et al., 2007). In the Philippines, the BPO sector's growth is primarily driven by the contact center subsector due to its large share in total BPO employment and revenues, as well as by government support. This is evident in the Philippine contact center industry, which remains attractive even to many foreign clients. The country is hitting it big in the industry due to its rich potential workforce. The Philippines has been a part of the global outsourcing industry (Amante, 2010; Magtibay-Ramos et al., 2007).

In 2015, the country's BPO industry was at its peak. However, in 2016, it was predicted that the annual growth rate of the BPO industry had decreased. It slowed to nine percent, an eight-point scale from the targeted 17 percent growth rate. Despite the decrease, the BPO industry generated \$23 billion in revenues in 2017 despite all of those issues. According to Kittelson & Carpo Consulting, the IT-BPOs in the Philippines are slowly becoming active again. There are as many as three newly registered companies weekly during the early part of the first quarter of 2018. Benedict Hernandez, chairman of the Contact Center Association of the Philippines (CCAP), said the roadmap to 2022 is looking bright. Local information technology-business process management (IT-BPM) is projected to have almost \$40 billion in revenue after six years at the end of 2022 (Barrientos et al., 2011; Bird & Ernst, 2009; D'Cruz & Noronha, 2010; James & Vira, 2010; Prado, 2015; Reese & Soco-Carreon, 2013).

With that, BPO employees need not worry because the Philippines will not fall on the list of countries that rule the BPO world. More companies will invest, which means more jobs will be available (Espina, 2015; Fernandez et al., 2011; NeoIT, 2016; Taylor, 2008).

One of the most robust sectors in the Philippines is the information technology and business process outsourcing (IT-BPO) sector. More than just a lucrative enterprise, the IT-BPO sector has also proven to be the country's most significant and fastest-growing industry. Its central role in providing quality jobs and encouraging economic activity and investment even in areas outside Metro Manila is very evident (Lee et al., 2016; NASSCOM, 2016; Pratap, 2010; Ramesh, 2004).

The Information Technology and Business Process Association of the Philippines (IBPAP) is the enabling association for the information technology and business process management (IT-BPM) industry in the Philippines. IBPAP serves as the one-stop information and advocacy gateway for the industry. It assists investors in setting up operations easily and quickly in the Philippines. Relevant research, introductions to key government and industry officials, and a series of briefings at each step of the investment process ensure a seamless development process. Ongoing support is provided through various initiatives, including programs such as Industry-Academe partnerships, research & knowledge sharing, HR development, business

development, and networking opportunities (Majumder & Sharma, 2014; Messenger & Ghoshen, 2010; Noronha & D' Cruz, 2006).

President Rodrigo Roa Duterte congratulates the Information Technology and Business Process Association of the Philippines (IBPAP) for charting the future of the information technology and business process management (IT-BPM) industry for the next six years with the formal launch of the Philippine IT-BPM Roadmap 2022.

The vital role of the IT-BPM sector in our growing economy, as cited in the Philippine Statistics Authority, is the biggest contributor to our Gross Domestic Product (GDP). The Philippines has a large pool of young BPO professionals. The workforce now totaled 1.2 million in 2016. By 2022, the IT-BPM sector is expected to produce 500,000 jobs outside NCR.

The shift in the structure of the workforce of the IT-BPM sector is expected that the sector will cater to more complicated requirements as the industry plans to climb the value chain. Some 73% of the workforce will be engaged in medium and high-level skill jobs in 2022— from 53% in 2016. On the other hand, the share of low-skill jobs, which at present is nearly half of the entire workforce, is seen falling to only 27% by 2022.

The Duterte administration included in its 10-Point Agenda the investment in human capital development, including match skills and training, and the promotion of science, technology, and the creative arts to enhance innovation and creative capacity. This ensures everyone that there will be enough qualified labor in this sector as we assure the IT-BPM sector that the Administration will protect the industry by enforcing and respecting existing contracts until their full implementation. Last June 25, 2014, the Don Mariano Marcos Memorial State University became one of the partners of the IBPAP. The College of Information Systems in DMMMSU-NLUC was one of the first colleges to offer the Service Management Program (SMP), one of the IBPAP Programs, under Board Resolution (BOR) Number 2014-218 dated October 7, 2014, the Specialized tract in Service Management Program. The track is based on Commission on Higher Education Memorandum Order (CMO) No. 34, s 2012 with 15 units and was implemented last school year 2014-2015 after the faculty members of the said college had undergone training.

Furthermore, with that partnership, IBPAP donated computer equipment to augment limited resources from national and local governments as part of the Service Management Program Laboratory, which is one of the components of the CHED project.

SITEL is one of the leading Business Process Outsourcing (BPO) companies in the Philippines that delivers world-class offshore customer management solutions to clients from various verticals. DMMMSU-NLUC, specifically the College of Information Systems, entered into a Memorandum of Agreement for Global Talent Acquisition with SITEL last October 13, 2015, at the new Central Administration Building. Signing the contract was President Atty. Benjamin P. Sapidula and Chancellor Dr. Jaime Manuel, Jr., for DMMMSU and Vice President of SITEL Ms. Heidi Enriquez and Ms. Laurie Guanzon for SITEL. The company is in partnership with the College for the On-the-Job Training, which started in September 2015. Through this partnership, students experience the actual work of a technical support representative for 600 hours of internship. During their internship, the students are provided with living allowances and free accommodation.

For the past three years, the campus, specifically at the College of Information Systems, has been able to send On-the-Job trainees to SITEL. The first batch (2015) of trainees underwent a series of assessment and screening processes to qualify. The first step is the Language Assessment which resulted in out of 44 applicants of DMMMSU-NLUC, only 25% Passed, and 52% will take the SITEL Academy. The next step is the initial interview. Out of 26 trainees who passed the first step, only 35% passed. In the final interview result, only 9 underwent the On-the-Job Training in SITEL, and 17 trainees were deployed in the government and private companies to do IT and clerical work. For the second batch (2016), 41% of the 37 applicants passed the assessment. In the final screening, 15 trainees passed for SITEL.

Aspiring Minds, the world's leading assessment company, helps organizations, governments, and institutions measure and identify talents. The vision is to create a level playing field in education and employment by introducing credible assessments. The mission is to develop a merit-driven labor market where everyone can access talent and opportunity. The researcher met Aspiring Minds personnel during the HR IT Summit of 2016 in Manila. The researcher initiated to have linkages to other BPO industries. Aspiring minds offers a free pre-employment skills assessment program for BPO companies abroad if applicants pass the whole screening process. The AMCAT is an adaptive computer test that measures job applicants in critical areas like communication skills, logical reasoning, quantitative skills, and job specifics domain, thus helping recruiters identify a candidate's suitability.

While most aptitude tests only measure a test taker's verbal comprehension and reasoning abilities. The AMCAT evaluates personality traits and domain skills, thus becoming an ideal test to match candidates. AMCAT also helps match a candidate with suitable jobs based on their performance on the test.

DMMMSU and Aspiring Minds Inc. signed a Memorandum of Understanding on September 15, 2016, for the university's pre-employment skill assessment program for Batch 2017. The objective of the pre-employment will 1) determine the employment potentials of the candidate related to the HR and generic skill area; 2) benchmark the candidate in terms of industry-specific recruitment standards; 3) provide psychometric-based behavior attitudes profiling and mapping; and 4) expose the candidate to a complete real-life process used by companies in terms of fresher or campus recruitment. Aspiring Minds works toward bridging the gap between Philippines Inc. and fresh Filipino talent by providing a Neutral and Professional Platform to both the corporate and the institutes. Aspiring Minds also works with many large corporates who may be keen to hire employment talent from the pool of candidates through assessment. It shall help the students find the right job matching their skill set depending on the companies' hiring requirements.

Research Problem

This research study aimed to determine the performance of the BSIS undergraduate students of the DMMMSU-NLUC under assessment of AMCAT exam to determined their employability in Business Process Outsourcing (BPO).

Specifically, it sought to answer the following questions.

1. What is the profile of the BSIS students on the assessment result as to:
 - a. Gender; and

- b. Secondary School Graduated?
- What is the performance of DMMMSU-NLUC BSIS students in terms of the following domain: 2.
- a. English;
 - b. Quantitative Ability;
 - c. Logical Ability;
 - d. Information Gathering and Synthesis;
 - e. Basic Computer Literacy;
 - f. Internet Ability; and
 - g. Office Administration?
- What are the identified strength and weaknesses of the BSIS students? 3.
- What is the level of employability of the AMCAT takers? 4.
- What curriculum enrichment program for BSIS can be done to improve the different domains? 5.

Scientific Basis/Theoretical Framework

In the last 15 years, the Philippine service sector has grown by over 10 percent in terms of value-added, while both the agriculture and manufacturing sectors have declined by 22 and 10 percent, respectively (Desiderio, 2015; Srivastava, 2010). This growth in services has paralleled growth in the Philippine BPO industry. Indeed, the BPO sector has tripled its global market share from four (4) percent in 2004 to 12.3 percent in 2014; by 2020, it is expected to further increase its share to 19 percent (OBG, 2015). Moreover, the Philippine BPO industry outperformed the world's BPO industry performance, posting an average growth of around 9– 12 percent between 2004 and 2014, while globally, the BPO industry registered an increase of approximately 5–7 percent during the same period.

Therefore, this study provides a framework to come up with the assessment data of the DMMMSU-NLUC in terms of Business Process Outsourcing to contribute to the curriculum enrichment of the Service Management Program. Figure 1 shows the conceptual framework of this study with Input-Process-Output. The input of the study includes the profile of the BSIS students along sex and secondary school graduate, AMCAT Assessment results, and the CMO 25 Series 2015 (Revised Policies, Standards, and Guidelines for Bachelor of Science in Computer Science (BSCS), Bachelor of Science in Information Systems (BSIS) and Bachelor of Science in Information Technology (BSIT) Programs), CMO 34 Series 2013 (Addendum to CMO 53, S 2006, Revised Policies, Standards and Guidelines for Information Technology Education (ITE) Programs Prescribing Specialization Track on Service Management for Business Process Outsourcing), CMO 12 Series 2013 (Addendum to CMO No. 53, S. 2006 Policies, Standards and Guidelines for Information Technology Education (ITE) Programs prescribing specialization Track on Business Analytics) and CMO 20 Series 2013 (Statement of the Commission on Higher Education on Filipino and the Revised General Education Curriculum).

The process includes documentation analysis, analysis of AMCAT Assessment Result, Identification of the Strength and Weaknesses, and Preparation of curricular enrichment. The output of the study is the BSIS Curricular Enrichment Program for SY 2018-2019. A broken line denotes feedback.

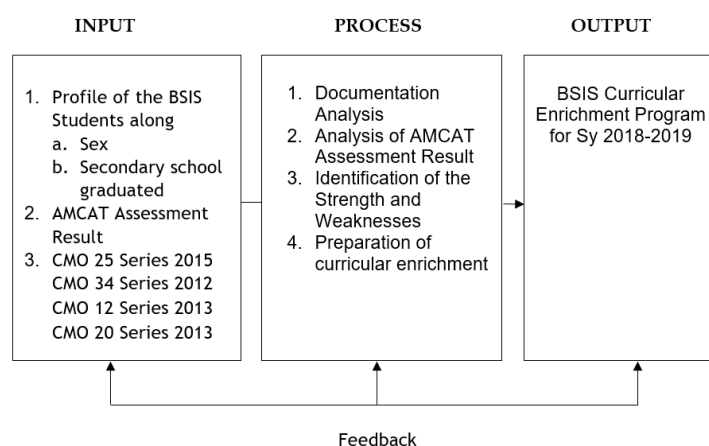


Fig. 1: Conceptual framework of the study

Methodology

Research Design

In this study, the descriptive design method was used. This method could respond to the objective of this study to address the preparedness of the BSIS student's employability success and to strengthen curriculum enrichment.

The descriptive design model describes the nature of the situation as it exists. Descriptive research is a type of research used to describe a population's characteristics. It collects data that is used to answer a wide range of what, when, and how questions about a particular population or group. Study data can be used to identify the prevalence of specific problems and the need for new or additional services to address these problems. According to Sahin and Mete (2021), descriptive research involves collecting data to test hypotheses or to answer questions concerning the current status of the subject of the study. Its purpose is to describe, explain, or validate some sort of hypothesis or objective regarding a specific group of people.

Descriptive research questions aim to define the variables you are measuring.

Sources of Data

The AMCAT exam is piloted to the twenty-seven (27) graduating BSIS students of the Batch 2017 of the Don Mariano Marcos Memorial State University – North La Union. Students were assessed in terms of their English, Quantitative Ability, Logical Ability, Domain Skills, and Personality. The assessment results were analyzed using Mean Score Analysis and Employability Analysis.

Instrumentation and Data Collection

The secondary data on the performance of the BSIS graduating students were obtained from the AMCAT online examination on September 18, 2017, in the Computer Laboratory Room. A proctor supervised the examination. Permission was obtained from the Aspiring Minds coordinator from India, and data were sent through email to the researcher after two months.

Analysis of Data

To summarize the profile of the students, frequency count and percentages were used. For the performance rating, mean score was computed and this was already provided by the summary result. The interpretation of the result used the color green for strength and orange and red as weaknesses.

Data Categorization

Table 1 shows the AMCAT Assessment Result of the following domains: a) English; b) Quantitative Ability; c) Logical Ability; d) Information Gathering and Synthesis; e) Basic Computer Literacy; f) Internet Ability and g) Office Administration.

Table 1: AMCAT assessment results

Domain	Descriptive	Equivalent
English .a	VLIR	MIR
Quantitative Ability .b		SIR
Logical Ability .c		
Information Gathering & Synthesis .d		
Basic Computer Literacy .e		
Internet Ability .f		
Office Administration .g		
Legend	VLIR	Very Less Improvement Required
	MIR	Moderate Improvement Required
	SIR	Strong Improvement Required

Results and Discussion

Profile of the BSIS students on the DMMMSU-NLUC Assessment result as to Sex

The data on the students' profile along sex and secondary school graduated were gathered from the College of Information Systems files for the period of SY 2016-2017. Table 2 shows the profile of the BSIS students along sex. Out of 27 students, 67% are female and 33% are male. This shows that the ratio of students for the female is much higher than the male. More females are interested in the Business Process Outsourcing (BPO) job. They are more confident and competent to perform well in the job.

Contrary to other studies, gender studies regarding employability must be equal opportunities. Conversely, the study shows that the difference in employability for female vs. male technical graduates is not more than two percentage points in any IT/ITeS sector. Females and males are equivalently employable in the skilled industry. On the other hand, the ratio of males to females in technical studies is 2:1. With unbiased hiring and similar aspiration level among both genders, the same ratio should be maintained in the IT/ITeS industry.

Table 2: Profile of the BSIS students along sex

Sex	Frequency	Percentage
Female	18	67%
Male	9	33%
Total	27	100%

The data presented in (Rajalakshmi, 2003) shows that female percentage in IT industry is 21%. This is much lower than the expected 33%. It may however be noted that the male-female ratio in technical studies in 2003 was much lower than it is today.

Profile of the BSIS Students along the Secondary School Graduated
 Table 3 shows the profile of the BSIS students along with secondary school graduated. It shows that the majority(81%) of the students were from public schools, and 19% were from private schools, which means that students of DMMMSU were from average families, and they want to avail affordable education with quality service.

Table 3: Profile of the BSIS students along secondary school graduated

Secondary School	Frequency	Percentage
Public	22	81%
Private	5	19%
Total	27	100%

Performance of DMMMSU-NLUC Students in terms of the Different Domains
 Table 4 shows the result of the AMCAT exam on the different domains. Basic Computer Literacy, English, and Quantitative Ability scores are 460,396 & 272, respectively, with a descriptive equivalent of Moderate Improvement. This means that the BSIS takers are more competent in Basic Computer Literacy as to Quantitative Analysis. On the contrary, the Office Administration, Logical Ability, Information Gathering and Synthesis and Internet Ability scores are 189, 293 and 371, respectively, with a descriptive equivalent of Strong Improvement Required. This means that the students need improvement in the Office Administration compared to the Internet Ability. The result shows that BSIS students still need more knowledge and skills to assess their employability in BPO. Their skills need more types of actual practice and explore more through research on the internet. Therefore, they need to improve all the domains to meet the gap in the BPO industry.

Table 4: Performance of the BSIS in terms of the different domains

Domain	Score	Ave AMCAT Takers to date	Descriptive Equivalent
English	396	525	MIR
Quantitative Ability	272	460	MIR
Logical Ability	293	480	SIR
Information Gathering and Synthesis	371	550	SIR
Basic Computer Literacy	460	525	MIR
Internet Ability	435	500	SIR
Office Administration	189	450	SIR
Legend	VLIR	Very Less Improvement Required	
	MIR	Moderate Improvement Required	
	SIR	Strong Improvement Required	

Table 5 shows the strengths and weaknesses of the BSIS students in various domains based on the secondary data provided by the Aspiring Minds. These multiple domains were ranked accordingly, showing that Office Administration ranked 1 and Basic Computer Literacy ranked 7, which means that the BSIS student takers lack competencies in the employability in the BPO industry. The BSIS students need time and effort to cope with the new trends and explore their knowledge in the BPO environment. They need more contact hours to learn about the different domains integrated into the specialization subjects to be more competent and skilled in acquiring the knowledge required for the Business Process Outsourcing Industry.

Table 5: Strength and weakness of the BSIS students to the following domains

Domain	Remarks	Rank
English	W	6
Quantitative Ability	W	5
Logical Ability	W	2

Information Gathering & Synthesis	W	3
Basic Computer Literacy	W	7
Internet Ability	W	4
Office Administration	W	1
Legend	S	Strength
	W	Weakness

Level of Employability in ITE's of the AMCAT Takers

Figure 2 shows that the employability in ITE's of the AMCAT takers has only 36%, with the descriptive interpretation of a Medium degree of improvement for the English, Cognitive Skills, and Domain Skills while null in the Personality. This means that the AMCAT takers need more improvement on the different domains for them to have very low improvement.

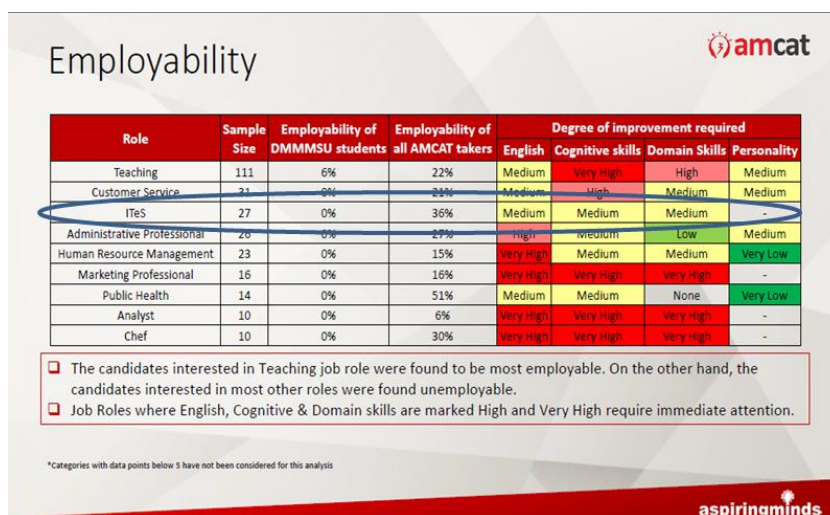


Fig. 2: Level of employability in IT of the AMCAT takers

Curriculum Enrichment for the BSIS Students specialized in Service Management Program The Service Management Program (SMP) was developed by IT-BPAP, a specialized track focusing on the IT-BPO industry. The specialized track in service management following the CHED policy (see CMO 34 S 2013) for outcomes-based education aims to prepare students, from all types of traditional courses, for a career in the IT-BPO industry by equipping them with the required competencies needed for entry-level positions and further career-development. However, in the three-year implementation of the program since 2014, some flaws have occurred in the employability of the IS students. Therefore, the curriculum enrichment proposal was developed (see Appendix) to strengthen the SMP in compliance with the requirement of CMO 25 S 2015 Revised Policies, Standards, and Guidelines of the Information Technology Education (ITE) Program with the CMO 34 Series of 2013 Specialized in SMP. The SMP uses an integrated approach and considers the interrelationships among the functional areas of business, notably in information and communication technology, as well as sensitivity to the economic, social, technological, legal, and international environment in which business must operate. The SMP aims to prepare students from all types of traditional courses for a career in the IT-BPO industry by equipping them with the required competencies needed for entry-level positions and further career development. The result shows that revising the curriculum (Service Management Program) increases the contact hour per subject of specialization. The inclusion of the laboratory hour of three (3) hours and two (2) hours total of five (5) hours per week as compared before that pure lecture of three (3) hours per week to have actual practice/activities to improve the skills, competencies, and employability of the IS students in the IT-BPO industry.

Furthermore, additional specialization was proposed, the Specialized in Business Analytics using the CMO 12 Series 2013 as a legal basis. Business Analytics Track uses an integrated approach and considers the interrelationships among the functional area of business and sensitivity to the economics, social, technological, legal, and international environment in which business must operate. In all of the subjects in Business Analytics, laboratory units for more contact hours and hands-on applications of the different business analytics tools were included.

Prior to the implementation of the curriculum for the SY 2018-2019, it has been Contents Noted by the Commission on Higher Education (CHED) the Bachelor of Science in Information Systems Specialized in Service Management Program Track and Specialized in Business Analytics Track last July 11, 2018.

Conclusions and Recommendations

The following conclusions were derived based on the research study findings.

1. They were moderately competent in the assessment of the BSIS in the AMCAT exam for employability in BPO.
2. More females (67%) are interested in the BPO job and more confident that they can perform well in the job than males (33%). Also, more BSIS students graduated from public (81%) than private (19%) schools in their secondary education.

The result of the AMCAT exam on the different Domains shows that the Basic Computer Literacy, English, and Quantitative Ability scores were 460, 396, and 272, respectively, with the descriptive equivalent of Moderate Improvement. On the contrary, the Office Administration, Logical Ability, Information Gathering and Synthesis, and Internet Ability with the scores 189, 293, and 371 have the descriptive equivalent of Strong Improvement Required, which means that the BSIS needs improvement in the Office Administration as compared to the Internet Ability. The employability in ITE's of the AMCAT Takers has only 36% with the descriptive interpretation of Medium degree of improvement for the English, Cognitive Skills, and Domain Skills while null in the Personality. The following domains were ranked accordingly: Office Administration rank 1 and Basic Computer Literacy ranked 7, which means that the BSIS student takers lack competencies in employability in the BPO industry. The Bachelor of Science in Information Systems Specialized in Service Management Program Track and Specialized in Business Analytics Track with the inclusions of laboratory hours were enriched in the old BSIS curriculum will improve the competence and skills having more time and with hands-on applications.

The following recommendations were made based on the findings and conclusions:

The assessment of the BSIS in the AMCAT exam for employability in BPO should be administered yearly to monitor the students' progress. .1
The GPA and extra-curricular activities are recommended to include in the profiling of the BSCS students for better findings. .2
The result of the AMCAT exam on the different domains should be monitored and study the improvements. .3
The employability in ITE's of the AMCAT Takers needs continuous monitoring and yearly improvement. .4
The different domains' result rank must be improved if AMCAT Assessment will be regularly conducted. .5
The curriculum enriched will be monitored and evaluated after three batches of graduates for comparative analysis. .6
Future research on the assessment of employability of the student on other curriculum program should be conducted. .7

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Appendices

Bachelor of Science in Information Systems Specialized in Service Management Program
and Specialized in Business Analytics


DMMMSU
DON MARIANO MARCOS MEMORIAL STATE UNIVERSITY
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Republic of the Philippines
OFFICE OF THE PRESIDENT
COMMISSION ON HIGHER EDUCATION
Regional Office 1
City of San Fernando, La Union

CERTIFICATION

TO WHOM IT MAY CONCERN:

This is to certify that the herein curriculum for the **Bachelor of Science in Information Systems** program of the **Don Mariano Marcos Memorial State University - North La Union Campus**, Bacnotan, La Union, is in accordance with the minimum requirements per CHED Memorandum Order No. 25, s. 2015 entitled "*Revised Policies, Standards and Guidelines for Bachelor of Science in Computer Science (BSCS), Bachelor of Science in Information Systems (BSIS), and Bachelor of Science in Information Technology (BSIT) Programs.*"

This is to certify further that said curriculum have been marked "**contents noted**" by this Office, effective School Year 2018-2019 and shall be applicable to incoming first year students of said school year. Should there be any change/s in the said curriculum in the future, it is requested that this Office be informed accordingly.

Issued this 11th day of July, 2018 at CHEDROI, City of San Fernando, La Union.


Cherrie
CHERRIE MELANIE ANCHETA-DIEGO, CESO III
Director IV

Not valid without seal


CHEDROI
City of San Fernando, La Union
JUL 11 2018

By: _____

ICS



DON MARIANO MARCOS MEMORIAL STATE UNIVERSITY
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COLLEGE OF INFORMATION SYSTEMS
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I. Vision
A premiere and globally competitive university.


II. Mission
Provides relevant quality instruction, research and extension.

III. Goal
To lead in transforming human resources into productive, self-reliant citizens and responsible leaders.

IV. Philosophy
Total human development with appropriate competencies.

V. Institutional Outcomes
DMMMSU aims to produce highly competent, specialized and globally competitive professionals. This is operationalized into graduate attributes that should be attained by the time students will graduate from the university.


1. Professionally competent
Exemplify the competencies and values required of their profession
2. Committed and responsible leader
Demonstrate professional, social, and ethical responsibility consistent with their roles as local and global citizens
3. Effective communicator and collaborator
Communicate effectively and work in multi-disciplinary teams
4. Critical thinker and innovator
Use relevant information and research drawn facts in rendering sound decisions and developing insights for new knowledge
5. Reflective lifelong learner
Engage in lifelong learning for continuous professional growth and development
6. Responsible environment steward
Manage a sustainable environment promoting peace and prosperity for mankind.




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BR. No. 99-031, BR. No. 2011-36, BR. No. 2018-424, CHEDRO1 Order No. 024, s. 2010




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VI. Program Title: BACHELOR OF SCIENCE IN INFORMATION SYSTEMS

VII. Program Description:




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
Graduate Attributes	CODE	Graduate Outcome References
Individual and Team Work	IS08	8. Function efficiently and effectively on teams in achieving the vision, direction and strategic purpose for the creation of an information systems project.
	IS09	9. Exhibit strong ethical principles and have good interpersonal communication in team skills.
Communication	IS10	10. Communicate and work efficiently, effectively and independently with a range of multi-disciplinary and diverse audience.
Computing Professionalism and Ethics in the Society	IS11	11. Ensure that data and IT infrastructure are protected from a variety of security threats and identify high level solutions to protect the data of the organization.
	IS12	12. Demonstrate an understanding of the social issues and ethical implications of technology across organizations and society.
Life-long Learning	IS13	13. Participate and engage in research and life-long learning, planning, and improving performance as the foundation for professional development.



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FIRST YEAR

Course Code	Descriptive Title	Pre-Req	Lec	Lab	Hrs	Unit
ISCC 101	Introduction to Computing	None	2	3	5	3
ISCC 102	Computer Programming 1	None	2	3	5	3
GECC 101a/b	Arts Appreciation/ Pagpapahalaga sa Sining	None	3	0	3	3
GECC 102a/b	Purposive Communication/Malayuning Komunikasyon	None	3	0	3	3
GECC 103a/b	Mathematics in the Modern World/Matematika sa Makabagong Daigdig	None	3	0	3	3
FIL 101	Kontikwalsadong Komunikasyon sa Filipino (KOMFIL)	None	3	0	3	3
PHEd 101	Fundamentals of Physical Fitness	None	2	0	2	2
NSIP 101b	Civic Welfare Training Service	None	3	0	3	3
Total			21	6	27	23

Course Code	Descriptive Title	Pre-Req	Lec	Lab	Hrs	Unit
ISPC 101	Fundamentals of Information Systems	None	2	3	5	3
ISCC 103	Computer Programming 2	ISCC 102	2	3	5	3
GECC 104a/b	Ethics/Etika	None	3	0	3	3
GECC 105a/b	Science, Technology & Society/Agham, Teknolohiya, at Lipunan	None	3	0	3	3
GECC 106a/b	Readings in the Philippine History/Mga Babasahin Hinggil sa Kasaysayan ng Pilipinas	None	3	0	3	3
GECC 107a/b	The Contemporary World/Ang Kasalukuyang Daigdig	None	3	0	3	3
FIL 102	Filipino sa Ibat ibang Disiplina	None	3	0	3	3
PHEd 102	Individual and Dual Sports	None	2	0	2	2
NSIP 102b	Civic Welfare Training Service	None	3	0	3	3
Total			24	6	30	26

SECOND YEAR

Course Code	Descriptive Title	Pre-Req	Lec	Lab	Hrs	Unit
ISCC 104	Data Structures and Algorithms	ISCC 103	2	3	5	3
ISPC 102	Professional Issues in Information System	ISPC 101	3	0	3	3
ISPE 101	Web Systems and Technologies	ISPC 101	2	3	5	3
ISPC 103	Organization and Management Concepts	ISPC 101	3	0	3	3
ISAE 101	Human Computer Interaction	ISCC 103	2	3	5	3
GECC 108a/b	Understanding the Self/Pangunawa sa Sarili	None	3	0	3	3
GEHC 101	Life and Works of Rizal	None	3	0	3	3
LIT 101	Sosyedad at Literatura/Panitikang Panlipunan	None	3	0	3	3
PHEd 103	Dances	None	2	0	2	2
Total			23	9	32	26

Course Code	Descriptive Title	Pre-Req	Lec	Lab	Hrs	Unit
ISCC 105	Information Management 1	ISCC 104	2	3	5	3
ISPC 104	IT Infrastructure and Network Technologies	ISPC 102	2	3	5	3
ISCC 106	Application Development and Emerging Technologies	ISCC 104	2	3	5	3
ISAE 102	IS Innovations and New Technologies	ISPC 102	2	3	5	3
ISAE 103	Object Oriented Programming	ISAE 101	2	3	5	3
ISAE 104	Principles of Accounting	None	3	0	3	3
LITT 102	SineSosyedad/Pelikulang Panlipunan	LIT 101	3	0	3	3
PHEd 104	Team Sports	None	2	0	2	2
Total			18	15	33	23


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ALIZATION TRACK


Note: Student may choose any of the 3 tracks below and once a track is chosen, all course in the track must be taken

A. SERVICE MANAGEMENT (Specialization Track)

Track No	Code No	Descriptive Title	Pre-Req	Lec	Lab	Hrs	Unit
1	ISSM 101	Fundamentals of Business Process Outsourcing 101	3rd Yr Standing	2	3	5	3
2	ISSM 102	Business Communication	3rd Yr Standing	2	3	5	3
3	ISSM 103	Fundamentals of Business Process Outsourcing 102	Track 1	2	3	5	3
4	ISSM 104	Service Culture	Track 2	2	3	5	3
5	ISSM 105	Principles of Systems Thinking	Track 4	2	3	5	3
TOTAL				10	15	25	15

B. BUSINESS ANALYTICS (Specialization Track)


Track No	Code No	Descriptive Title	Pre-Req	Lec	Lab	Hrs	Unit
1	ISBA 101	Fundamentals of Business Analytics	3rd Yr Standing	2	3	5	3
2	ISBA 102	Fundamentals of Analytics Modeling	3rd Yr Standing	2	3	5	3
3	ISBA 103	Fundamentals of Enterprise Data Management	Track 1	2	3	5	3
4	ISBA 104	Analytics Techniques and Tools	Track 2	2	3	5	3
5	ISBA 105	Analytics Application	Track 4	2	3	5	3
TOTAL				10	15	25	15



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CURRICULUM MAP

Course Code	Course Title	Pre-requisites	Units	Learning Outcome	IS 01	IS 02	IS 03	IS 04	IS 05	IS 06	IS 07	IS 08	IS 09	IS 10	IS 11	IS 12	IS 13		
ISCC 101	Introduction to Computing	None	3	LO1	Explain fundamental principles, concepts and evolution of computing systems as they relate to different fields.	I				I	I								
				LO2	Expound on the recent developments in the different computing knowledge areas.	I				I	I								
				LO3	Analyze solutions employed by organizations to address different computing issues.	I	I					I							
ISCC 102	Computer Programming Fundamentals Of Programming	None	3	LO1	Design, implement, test, and debug a program, based on a given specification, that uses each of the following fundamental programming components: (1) primitive data types, (2) basic computation, (3) simple I/O, (4) conditional and iterative structures, (5) definition of functions and parameter passing, and (6) recursion.	I	I												
				LO2	Analyze and simulate results of algorithms that may be implemented as a solution to a given problem.	I	I	I	I										
ISCC 103	Computer Programming 2 Intermediate Programming	ISCC 102	3	LO1	Design, implement, test, and debug a program, based on a given specification that uses: (1) data structures arrays, strings, structures, linked list and files, (2) conditional, iterative, and recursive constructs, and (3) standard libraries in the assigned programming language.	I	I	I	I										
				LO2	Assess and recommend revisions to another programmer's code (1) regarding appropriateness of chosen data structure, (2) regarding appropriateness of chosen conditional and iterative constructs given a programming task, and (3) regarding thoroughness in applying procedural abstraction.	I	I	I	I	I									
ISCC 104	Data Structures and Algorithms	ISCC 103	3	LO1	Design, implement, test, and debug a program, based on a given specification, that uses and implements abstract data types (stacks, queues, priority queues, sets, maps).	E	E		E		E	E		E					
				LO2	Argue strengths and weaknesses among multiple implementations for a problem (i.e., on the aspects of iterative vs. recursive solutions and on the aspects of abstraction, encapsulation and information hiding).	E	E		E		E	E		E		E			
ISCC 105	Information Management	ISCC 104	3	LO1	Analyze an existing database system with respect to quality issues: Reliability, scalability, efficiency, effectiveness and security.	E	E	E	I		E			E					
				LO2	Design a database based on user requirements using a widely used modeling notation, and be able to use declarative query language to elicit information.	E	E		I	I	E				E		E		
ISCC 106	Applications development and emerging technologies	ISCC 104	3	LO1	Develop specifications for a software development effort that precisely articulates the functional requirements, expected execution paths, and the explicit use of cutting edge or emerging technologies, which includes hardware devices and software library APIs.	E	E	E	D	D	D	D				D			
				LO2	Select and use a defined coding, documentation writing, and licensing standards in a sufficiently complex software project where coding idioms and mechanisms for implementing designs to achieve desired properties such as reliability, efficiency, and robustness are	E	E		D		D	D					D		




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Course	Section	ISPC	ISCC	LO	LO Description	1	2	3	4	5	6	7	8	9	10	11	12								
ISPE 101	Web Systems and Technologies	ISPC 101		LO6	Convey results of data analysis to organizational stakeholders at various levels.																				
				LO7	Perform high-quality tasks required by the organization in particular and the industry in general.																				
ISPE 101	Web Systems and Technologies	ISPC 101		LO1	Develop Web applications using HTML, XHTML, XML, client-side programming and other Web GUI technologies to create and validate documents, generate contents via programming and integrate digital libraries with other media contents.	E	E	E	E	E	E	E	E	E	E	E	D	C							
				LO2	Set up a web server to support server-side processing in a secure fashion and identify common server-side configuration issues that affect securing.	E	E	E	E	E	E	D	D							D	E				
ISPE 102	IT Security and Management	ISPC 104	3	LO1	Understand the fundamentals of managing information security systems and personnel.	E	E											D	D						
				LO2	Learn how security and management are interrelated.	E	E						F						D	D					
				LO3	Understand the laws and regulations surrounding information security.	E					E		E								D	D			
				LO4	Learn how to plan for disaster recovery.	E	E				E		D	E								D			
ISPE 103	Information Management II	ISCC 105		LO5	Learn how to conduct security audits.	E	E												D	D					
				LO1	Analyze an existing database system with respect to quality issues: Reliability, scalability, efficiency, effectiveness and security.		E				E	E	E	D							D	D			
ISPE 104	IT Audit and Control	ISPE 103	3	LO2	Use of joins and unions in executing SQL queries for normalized tables.		E		E											D					
				LO1	Establish an understanding of the IT environment and the role of the IT auditor.	I		E						E	E						E	D	E		
				LO2	Recognize how corporate and IT governance practices impact the IT audit process.	I		E								E							E	D	
				LO3	Develop an understanding of the IT audit process (i.e. risk assessment, planning, standards, guidelines and best practices).	I		E				E												E	D
ISAE 101	Human Computer Interaction	ISCC 103	3	LO4	Survey IT audit approaches to systems development and maintenance, IT security, IT service delivery and support, business continuity and disaster recovery and data analytics and fraud detection.		E				E	D	D								E				
				LO1	Analyze different user populations with regard to their abilities and characteristics for using both software and hardware products.	I	I	E				E	E	E											
ISAE 102	IS Innovations and New Technologies	ISPC 102	3	LO2	Evaluate the design of existing user interfaces based on the cognitive models of target users.	I	I	E				E	E	E											
				LO1	Select and apply disciplinary knowledge in discussing (individual assignment) and creating (group assignment) innovative technological solutions.			E			E	D												D	
				LO2	Research, evaluate and propose solutions to innovation and technology business issues.	E		E						D											D
				LO3	Discuss ethical and environmental implications of technological innovation – and consider such implications in your proposed solutions.		E				E	E												E	E
				LO4	Discuss social and cultural implications of technological innovation – and consider							E									D	E	E	D	



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ISPC	Course	Prerequisite	Credits	LO	Description	1	2	3	4	5	6	7	8	9	10	11	12					
				LO1	practiced with respect to legal and ethical considerations.																	
				LO1	Undertake, as part of a team activity, an inspection of the source code and unit testing of the functional units of a sufficiently complex software project.	E	E		D			D	D				D					
ISPC 101	Function entities Of Information Systems	None	3	LO1	Compare and identify the major technologies and applications of information systems in driving development and changes in enterprise.	I	I	I	I			I	I				I					
ISPC 102	Professional Issues in Information Systems (IS)	ISPC 101	3	LO1	Examine professional, ethical and moral challenges in computing and use of information systems and recommend courses of action.												E	E	E	D	E	
				LO2	Apply/revise ethical thinking skills in analyzing and finding resolutions to computing issues.												D	D	D	D	E	
ISPC 103	Organizational and management concepts	ISPC 101	3	LO1	Examine and evaluate organizational structure policies and procedures and the information systems that support them.	I	E	E				E					E	E	E	E	D	
				LO2	Examine and evaluate management lifecycle and information systems that support them.	I	E	E				E					E	E	E	E	D	
ISPC 104	IT infrastructure and network technologies	ISPC 102	3	LO1	Evaluate how IT infrastructure components are organized into infrastructure solutions in different organizational environments.	D	E	E	E	D		E					E	E	E			
				LO2	Examine, test and evaluate web solutions as applied to business enterprises.	D	E	E	E	D		D					D	D	D			
ISPC 105	Systems Analysis and Design	ISAE 103		LO1	Use systems thinking to analyze business processes and identify problems and opportunities that can be solved and supported by technology solutions.	D	D	E		D	E	E	E	E			E					
				LO2	Apply appropriate tools, methods, models/techniques in systems analysis and design.	E	E	E	E	D	D	D	E	D			D					
				LO3	Develop and defend a project design proposal to different audiences.				D	D	E	D	D	E	D		D					
ISPC 106	Financial Management	ISAE 104	3	LO1	Examine and evaluate financial processes and reports and the information systems that support them.	E	E	E	E	E							E					
ISPC 107	IS Project Management I	ISAE 102	3	LO1	Examine the use of project management best practices in real-life projects.	E	E	E	E	E	E						D				E	
				LO2	Apply project management concepts, principles and tools in performing an actual IS project.	E	E	E	E	E	E						D		D		E	
ISPC 108	Enterprise Systems and Architecture	ISAE 105		LO1	Understand how information flows across enterprise systems and the business operations in the enterprise.																	
				LO2	Analyze different enterprises and apply system concepts in both manufacturing and service industries.		E	E		D	D	E	E								D	
				LO3	Know the basic principle and components of enterprise.	I		I		I												E
				LO4	Examine and evaluate core concepts of data/information architecture used in existing data/information architecture designs.	E	E	E	C		D		E	E								E

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