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September 4, 2019

Dr. John Nicklow, President
University of New Orleans
2000 Lakeshore Drive
New Orleans, LA 70148

Dear Dr. Nicklow:

On August 27, 2019, the Board of Supervisors for the University of Louisiana System approved the following requests from University of New Orleans:

1. Request to approve a Graduate Certificate in Machine Learning and Artificial Intelligence.
2. Request to approve an Undergraduate Certificate in Unmanned Systems Management.
3. Request to approve 2019-20 Promotions in Faculty Rank and Recommendations for Tenure.
4. Request to approve Fiscal Year 2020-21 Capital Outlay Budget Request and Five-Year Capital Outlay Plan.
5. Request to accept Fiscal Year 2018-19 Financial and Compliance and Federal Award Program Representations Letters.
6. Request to approve Fiscal Year 2019-20 Operating Budget, including organizational chart, Undergraduate/graduate mandatory attendance fees, scholarships, and System Shared Costs.

Enclosed for your records are the Executive Summaries with the resolutions that were approved by the Board along with the approved personnel actions. If you have any questions, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "JKahn", written over the typed name and title.

Jeannine Kahn, Ph.D.
Provost and Vice President for Academic Affairs

**BOARD OF SUPERVISORS FOR THE
UNIVERSITY OF LOUISIANA SYSTEM**

ACADEMIC AND STUDENT AFFAIRS COMMITTEE

August 22, 2019

Item E.7. University of New Orleans' request for approval of a Graduate Certificate in Machine Learning and Artificial Intelligence.

EXECUTIVE SUMMARY

The University of New Orleans (UNO) is requesting approval of a Graduate Certificate (GC) in Machine Learning (ML) and Artificial Intelligence (AI). Current trends indicate that ML and AI are transforming industries such as manufacturing, healthcare, self-driving vehicles, finance, online retail, to name a few, profoundly. Discipline-wise, ML and AI cover a wide spectrum of applications such as search engines, stock-market predictions, game playing, medical diagnosis, and bioinformatics. Artificial Intelligence uses ML to form a computing machine or program an intelligent agent, which can perceive its environment and take actions that maximize its chances of successfully achieving its goals. Nowadays ML and AI help computers learn complex and hard-to-solve problems without requiring the writing of program-code explicitly. This paradigm shift has been necessitated by the emergence of big data and high-throughput data generation, for which the applications of ML and AI have been essential.

The proposed GC, composed of 12 credit hours, has been designed by UNO's Computer Science Department in an effort to produce graduate students rapidly, who will be qualified for high-demand jobs, especially in ML and AI areas. The creation of the proposed GC is in response to companies, industries, and institutions, such as DXC Technology, GE Digital-New Orleans, Intralox., Entergy, Cleco, iSeatz, Lucid, SampleChain, Space and Naval Warfare Systems Command, Pine-Biotech, NASA and Naval Research Laboratory-Stennis Space Center, and the Louisiana Department of Wildlife and Fisheries, who have already contacted and collaborated with the Computer Science Department at UNO for advanced ML and AI application development. Core courses required of the proposed GC have been offered at UNO since 2014. By leveraging faculty expertise, existing courses, and infrastructure developed at UNO over the last decade, the University will be able to cost-effectively offer a GC that directly responds to one of the highest areas of demand and most acute shortage of professionals with advanced training both within Louisiana and beyond.

The proposed GC will target two streams of potential students – graduates of traditional undergraduate programs in Computer Science (CS) and professionals with non-CS degrees who are currently interested in enhancing their ML and AI skills or are seeking a career change. The University's Bachelor of Science in CS (with nearly 400 majors and soon-to-be available concentrations in ML and AI) will be the primary feeder, but the ultimate goal is to establish a GC with a regional reputation that will draw from a state-wide pool of applicants. With that in mind, UNO plans to provide the offering via 100% distance learning technologies once the GC is established.

RECOMMENDATION

It is recommended that the following resolution be adopted:

***NOW, THEREFORE, BE IT RESOLVED,** that the Board of Supervisors for the University of Louisiana System hereby approves the University of New Orleans' request for approval of a Graduate Certificate in Machine Learning and Artificial Intelligence.*

PROPOSAL to DEVELOP a NEW ACADEMIC CERTIFICATE PROGRAM
(CAS, PAC, UC, PBC, GC, PMC, PPC)

Date: May/25/2019

Campus: Lakefront Campus, University of New Orleans (UNO).	Program: CIP, Certificate Designation, Title: CIP: 11.0701 Designation/Title: Graduate Certificate in Machine Learning and Artificial Intelligence
Institutional Contact Person & Contact Info (if clarification is needed): MAHDI ABDELGUERFI, Ph.D. Professor & Chair 308 Mathematics Bldg., University of New Orleans, 2000 Lakeshore Drive, New Orleans, LA 70148. 504.280.6594 mahdi@cs.uno.edu	

1. Certificate Description

Describe the program concept: purpose and objectives; proposed curriculum; mode of delivery (on-site/hybrid/on-line). Indicate which courses are new; describe plan for rolling out new courses.

**** Attach catalog descriptions for the required and elective courses, including prerequisites and LCCN, when applicable. ****

The University of New Orleans (UNO) proposes to launch a graduate certificate in *Machine Learning (ML)* and *Artificial Intelligence (AI)*, which would help the Computer Science (CS) Department in its effort to produce graduate students rapidly, who will be qualified for high-demand jobs, especially in the ML and AI areas. Indeed, in the discipline of Computer Science, the top salary in North America is offered for ML and AI practitioners (US \$143,750/year¹).

Furthermore, the structure and content of the proposed program are being modeled after prominent graduate certificate programs in ML and AI, to wit: the graduate certificate in ML and AI at MIT², the graduate certification in AI program at Stanford³, with adaptations to take further advantage of the strengths of UNO in these fields.

To obtain a graduate certificate in ML and AI, a student will have to complete **two** required courses and two electives from a pool of seven three-credit courses.

(To be taken)	Courses	Credit Hours
Required (2)	CSCI 6521 Advanced Machine Learning I	3
	CSCI 6522 Advanced Machine Learning II	3
Electives (2)	CSCI 6250 Big Data Analytics and Systems	3
	CSCI 6454 Parallel and Scientific Computing	3
	CSCI 6633 Computer Vision	3
	CSCI 6634 Data Visualization	3
	CSCI 6645 Planning Algorithms in Artificial Intelligence	3
	CSCI 6650 Intelligent Agents and Multi-Agent Systems	3
	CSCI 6990 Topics in Advanced Computer Science	3

REQUIRED COURSES:

A student must complete two core courses, CSCI 6521 and CSCI 6522. The courses' descriptions are as follows:

CSCI 6521 Advanced Machine Learning I -- A probabilistic perspective of machine learning - Regression, Probability, Bayesian Statistics, Kernels, Deep Learning and models such as Gaussian, Mixture, and Markov. Students will have opportunities to learn state-of-the-art machine learning algorithms, implementations, and their application to solve real-world problems. The focus of the class would be on the programming aspects of the statistical topics listed here.

CSCI 6522 Advanced Machine Learning II -- Topics include advanced machine learning models such as Neural Networks, Support Vector Machines, Boosting, Genetic Algorithms, Clustering, Decision Trees, Random Forests, and Deep Belief Nets. Students will have opportunities to learn state-of-the-art machine learning algorithms, implementations, and their application to solve real-world problems. The focus of the class would be on the programming aspects of the statistical topics listed here.

¹ <https://www.indeed.com/salaries/Artificial-Intelligence-Salaries>

² <https://professional.mit.edu/programs/short-programs/professional-certificate-program-machine-learning-ai>

³ <https://scpd.stanford.edu/public/category/courseCategoryCertificateProfile.do?method=load&certificateId=1226717>

ELECTIVE COURSES:

A student must select two out of seven elective courses, which are CSCI 6250, CSCI 6454, CSCI 6633, CSCI 6634, CSCI 6645, CSCI 6650 and CSCI 6990. They are described below:

CSCI 6250 Big Data Analytics and Systems -- This course covers a combination of knowledge in data mining, database warehousing, and distributed systems for utilizing information assets of high volume, high velocity, high variety, and high veracity. The class discussions will cover the key problems, theoretical perspectives, methodologies, algorithms, technologies, and tools in these involved areas such as data exploration techniques, linked data perspectives, semantic data services, statistical analysis for big data, and the supporting tools in distributed systems including HADOOP, Map Reduce, Hive and HBase as well as Sal OLAP extensions.

CSCI 6454 Parallel and Scientific Computing -- An introduction to the fundamental concepts of real-world scientific computing using modern parallel computing architecture. Includes parallel architectures, parallel programming methods and techniques, parallel algorithm designs, and parallel performance analysis. Hands-on experience with MPI, OpenMP, MapReduce, CUDA (GPU), and related technologies with applications to diverse scientific domains. Students will learn to write parallel programs to solve practical problems in the discipline of their interests.

CSCI 6633 Computer Vision -- This course provides an overview of fundamental techniques for representing and recognizing visual patterns in two or three dimensions. Topics covered include segmentation and morphology, pattern recognition and classification, color- and text-based measures, motion analysis, and optical flow, three-dimensional models from stereo imaging, knowledge-based systems, and scene understanding.

CSCI 6634 Data Visualization -- An introduction to standard techniques for displaying, exploring, and understanding non-visual data from medical, scientific, engineering, financial, or other domains. Topics covered will include visualization models, data representation, color-mapping and contouring, volume rendering, data transformations, modeling, image processing techniques, animation and user interaction.

CSCI 6645 Planning Algorithms in Artificial Intelligence -- Planning formalism within classical Artificial Intelligence research that studies how to represent and discover sequences of actions that change the world from some initial state to the desired goal state. This class surveys planning research from the 1960s to the present. Topics covered include partial-order and least-commitment planners, plan graphs, planners based on satisfiability and constraint-satisfaction, and modern state-space planning heuristics.

CSCI 6650 Intelligent Agents and Multi-Agent Systems -- An investigation of computational systems in which several intelligent agents or agents and humans, interact. Includes architectures for building intelligent agents, design, and implementation of multi-agent systems, inter-agent communication languages, and protocols, problem-solving, planning, learning and adaptation techniques in multi-agent systems.

CSCI 6990 Topics in Advanced Computer Science -- This is an advanced graduate-level course whose topics may change from semester to semester. The prerequisites change as dictated by the topic. This course may be taken multiple times for credit. The topics are but not limited to Deep Learning, Reinforcement Learning, Evolutionary Learning, Robotics, Optimization, Probabilistic Graphical Models, Natural Language Processing, Machine Learning for Data Streams, Recommender Systems, Advanced Game Theory, Computational Neuroscience, Algorithmic aspect of Molecular Dynamics and so on. CSCI 6990 to assist the department in coping, in a timely manner, with the rapid changes happening in the high demanding ML and AI areas.

The courses included in the proposed curriculum are already entirely in existence.

2. Need

Outline how this program is deemed essential for the wellbeing of the state, region, or academy (e.g., how is it relevant, how does it contribute to economic development or relate to current/evolving needs). Identify similar programs in the state and explain why the proposed certificate is needed.

WORKFORCE NEEDS

Current trends indicate that ML and AI are transforming industries such as manufacturing, healthcare, self-driving vehicles, finance, online retail, to name a few, profoundly. Discipline-wise, ML and AI cover a wide spectrum of applications such as search engines, stock-market predictions, game playing, medical diagnosis, and bioinformatics. AI uses ML to form a computing machine or program an intelligent agent, which can perceive its environment and take actions that maximize its chances of successfully achieving its goals⁴.

Nowadays, ML and AI help computers learn complex and hard-to-solve problems without requiring the writing of program-code explicitly. This paradigm shift has been necessitated by the emergence of big data and high-throughput data generation, for which the applications of ML and AI have become essential. This is because it is now necessary and unavoidable to automate the

⁴ <https://web.archive.org/web/20151118212402/http://www-formal.stanford.edu/jmc/whatisai/whatisai.html>

methods to be applied to uncover the patterns to predict future data and train machines. ML and AI techniques are used to address critical pattern recognition and classification problems from the given dataset in various applications. The objective of the ML and AI program is to teach those techniques and apply them properly. The target techniques are particularly useful in high-dimensional and complex data space, where deterministic approaches are infeasible or are difficult to apply.

REGIONAL EMPLOYER NEEDS

Recently-established DXC Technology is building a 2,000-job Digital Transformation Center across the street from the Louisiana Superdome in downtown New Orleans and plans to hire 300 IT and business enterprise professionals by the end of year one⁵. Most importantly, it plans to integrate a model of higher-education workforce solutions to prepare talent for its Digital Transformation Center, where next-generation technology services that support clients' digital transformations will be developed and delivered. DXC's annual payroll will exceed \$133 million by 2025. DXC is hiring qualified candidates in Data Science where Machine Learning and Artificial Intelligence knowledge are required⁶.

Companies, industries, and Institutions, such as GE Digital–New Orleans, Intralox, Entergy, Cleco, iSeatz, Lucid, SampleChain, Space and Naval Warfare Systems Command (SPAWAR), Pine-Biotech, NASA and Naval Research Laboratory–Stennis Space Center, Louisiana Department of Wildlife and Fisheries, are already contacting and collaborating with the Computer Science Department at the University of New Orleans for advanced ML and AI application development.

RELEVANT GRADUATE PROGRAMS AT LOUISIANA INSTITUTIONS

The Computer Science departments of note in Louisiana find their homes at these institutions: Louisiana Tech University, University of Louisiana at Lafayette, Louisiana State University, University of Louisiana Monroe, University of New Orleans (UNO), Southeastern Louisiana University, McNeese State University, Grambling State University, and Southern University and A&M College.

Among these universities, only UNO currently employs a significant number of faculty members in its Department of Computer Science with instructional and research expertise in ML, AI & Big Data. Indeed, the UNO Computer Science Department is home to the Bioinformatics and Machine Learning Lab (BMLL), the Narrative Intelligence Lab (NIL), and the Canizaro/Livingston Gulf States Center for Environmental Informatics (GulfSCEI)⁷.

The University of Louisiana at Lafayette (UL) houses the National Science Foundation Center for Visual and Decision Informatics (CVDI) and Center for Business & Information Technologies (CBIT), but these barely overlap Data Science, let alone Machine Learning and Artificial Intelligence.

The Department of Global Biostatistics and Data Science at Tulane hosts the Global Research Data Center (GRDC) and the Center for Bioinformatics and Genomics, with its Multiscale Bioimaging and Bioinformatics Laboratory (MBB). However, this is only one-third of the ML and AI related programs that UNO already covers.

The Louisiana State University (LSU) Stephenson Department of Entrepreneurship & Information Systems (SDEIS) is focused on producing entrepreneurs who are primarily grounded in business analytics & information systems.

There does not currently exist a Graduate Certificate degree that focuses on ML and AI offered by any of these universities. It is our contention that UNO is prominently positioned and only needs to integrate its different programs to offer a very timely and much-needed Graduate Certificate in ML and AI.

GLOBAL DEMANDS AND ADVANCING LOUISIANA

It has been estimated that by 2030, the economic impact of ML and AI on North America and Worldwide, will be about \$4 trillion and \$16 trillion, respectively^{8,9}. It has already been mentioned that the average salary for ML and AI jobs is about US \$144k/year in North America. However, the top salary is offered by Japan, which is just under US \$1 million/year¹⁰, an indication that there is a very high demand for the discipline worldwide.

There is a well-documented and pervasive shortage of ML and AI professionals at all levels of industry and government. One report suggests that there are 300,000 AI engineers worldwide, but millions more are needed¹¹. A recent article in *Forbes Magazine* predicts that the growth of AI will create 58 million new jobs by 2022¹². In Louisiana, the demand for experts in ML and AI is high. According to Glassdoor, a job posting website¹³, New Orleans, Baton Rouge, Lafayette, Shreveport, Monroe, Lake Charles, Alexandria, Metairie, Hammond and Bossier City are the top cities in the state with a need for experts in ML and AI.

⁵ <http://gov.louisiana.gov/index.cfm/newsroom/detail/1129>

⁶ <https://www.ziprecruiter.com/Jobs/Artificial-Intelligence/--in-Louisiana>

⁷ <https://www.mastersindatascience.org/schools/louisiana/>

⁸ P. Stone, R. Brooks, E. Brynjolfsson, R. Calo, O. Etzioni, G. Hager, J. Hirschberg, S. Kalyanakrishnan, E. Kamar, S. Kraus, K. Leyton-Brown, D. Parkes, W. Press, A. Saxenian, J. Shah, M. Tambe, and A. Teller. *Artificial Intelligence and Life in 2030*. One Hundred Year Study on Artificial Intelligence: Report of the 2015-2016 Study Panel. Stanford University, Stanford, CA. 2016.

⁹ T. Mills. "The Impact of Artificial Intelligence In The Everyday Lives Of Consumers." August, 2018;

<https://www.forbes.com/sites/forbestechcouncil/2018/03/07/the-impact-of-artificial-intelligence-in-the-everyday-lives-of-consumers/>

¹⁰ <https://medium.com/mlmemoirs/artificial-intelligence-salaries-heading-skyward-e41b2a7bba7d>

¹¹ <https://www.forbes.com/sites/bernardmarr/2018/06/25/the-ai-skills-crisis-and-how-to-close-the-gap/#46773e5631f3>

¹² <https://www.forbes.com/sites/amitchowdhry/2018/09/18/artificial-intelligence-to-create-58-million-new-jobs-by-2022-says-report/#79681d74d4ba>

¹³ https://www.glassdoor.com/Job/new-orleans-machine-learning-jobs-SRCH_IL.0.11_IC1150035_KO12.28.htm

Additionally, a review of the job listings in Glassdoor reveals that a large number of companies and federal agencies are currently seeking experts in ML and AI for positions in Louisiana including: DXC, IBM Baton Rouge, Radiance Technologies, Choices, Lucid, AWS, Sirius Computer Technologies, Danaher, Cynet Systems, Device Medical Products, Ochsner Health System, Acuity One LLC, Salient CRGT, U.S. Navy, Bennett Aerospace, Entergy and the U.S. Army Corps of Engineers - New Orleans District. Furthermore, iMerit is in the process of establishing an AI center in New Orleans with the goal of hiring 100 employees within 12 to 18 months¹⁴. Finally, two video game development companies, High Voltage and inXile have recently opened game studios in New Orleans with the goal of hiring 85 and 50 IT specialists¹⁵ (many of whom are expected to have expertise in ML and AI) respectively.

By leveraging the expertise, curriculum, and infrastructure developed over the last decade, UNO will be able to cost-efficiently create a Graduate Certificate that directly responds to one of the highest areas of highest demand and most acute shortage of professionals with advanced training both within Louisiana and nationwide. Therefore, it makes eminent sense to establish a Graduate Certificate in ML and AI at this critical juncture.

3. Students

Describe student interest. Project enrollment and productivity for the first 5 years; justify projections.

UNO has been offering all the core courses in the proposed program regularly since 2014. There is an overwhelming interest on the part of students to take these offerings. For example, the graduate-level Advanced Machine Learning course that was offered in the Spring 2019 semester quickly filled all the initial seats. After fielding many requests, an additional 35% more students had to be accommodated due to legitimate interest and requirements.

Additionally, it is not just Computer Science students who enroll in these graduate-level courses. Indeed, students from many other disciplines, such as Electrical Engineering, Mathematics, Biology, Earth & Environmental Science/Coastal Sciences, and even College of Sciences non-degree matriculants, seek advice to learn and request enrollment in these courses.

The program will target two streams of potential candidates—alumni of traditional undergraduate programs in Computer Science (CS), and professionals with non-CS degrees who are currently interested in enhancing their ML and AI skills or are seeking a career change. UNO’s B.S. program in Computer Science, with nearly 400 majors, and soon-to-be available concentration in ML and AI will be a primary feeder, but the ultimate goal is to establish a Graduate Certificate with a regional reputation that will draw from a state-wide pool of applicants.

Projected enrollment:

Year 1	Year 2	Year 3	Year 4
10	20	30	40

The estimate for the first year is based on feedback from existing students to gauge their interest in ML & AI as a career. The target enrollment for the program is a minimum of 40 students. We consider this to be a conservative estimate and expect to reach that level by Year 4 at the latest. The targeted enrollment growth will come from four main pools:

- Alumni of the UNO B.S. program in Computer Science who are interested in ML and AI; in AY 2018, there were 56 graduates in this program.
- Working professionals in partner companies and government agencies, specifically: SPAWAR New Orleans, which is located next to UNO; Naval Research Lab (NRL) & Naval Oceanographic Office (NAVO), both located at Stennis Space Center in Mississippi. Both entities are keenly interested in establishing an educational pipeline for their employees.
- General recruitment via advertising and marketing.
- Online/hybrid content delivery.

Once the program is officially established, we plan to prepare, over a period of no more than one year, for full online/hybrid delivery of all the courses. Our new generation classroom facilities feature high-quality audio/video streaming capabilities and multiple displays that will allow for effective remote presence and interaction. The Computer Science High End Computing facilities will make hands-on exercises fully accessible 24/7 to students from anywhere.

4. Accreditation

Describe plan for achieving program accreditation.

Currently, the entity that grants accreditation in the area of Computer Science, ABET, does not do this for certificate programs. From the ABET website we glean this statement: “[ABET accredits] postsecondary, degree-granting programs offered by regionally accredited institutions in the United States and nationally accredited institutions outside the United States. We do not accredit certification, training or doctoral programs.”

¹⁴ https://www.nola.com/business/2018/04/100_jobs_planned_at_new_orlean.html

¹⁵ <http://fortune.com/2015/11/23/video-games-help-rebuild-new-orleans/>

5. Faculty, Administration, & Other Resources

How will instructional needs be met: will additional faculty, facilities, equipment, or library resources be required? What department will deliver and oversee the proposed program?

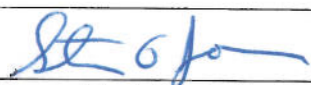
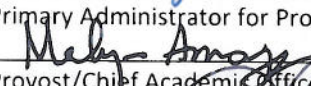
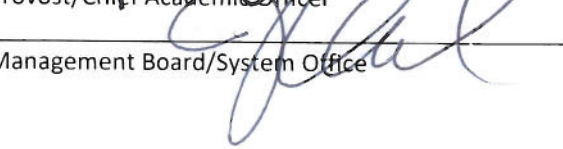
The entire course offerings proposed in the graduate certification program already exists in the Department of Computer Science with an adequate number of expert faculty members to offer and teach them. Therefore, the Department of Computer Science at UNO will deliver and oversee the proposed program.

6. Cost

Summarize additional costs to offer the program. On separate budget sheet, estimate costs and revenues for the projected program for the first five years, indicating need for additional appropriations (if any).

An initial cost of \$100,000 – \$125,000 is anticipated to purchase equipment such as server-machines to enhance the in-house cloud infrastructure, high-capacity storage to store heterogeneous datasets to conduct the additional courses and research exercises. Part of the needed computing equipment has already been ordered using an ongoing BoR Enhancement grant. The cost of the remaining equipment will be absorbed by the Computer Science Department as part of its infrastructure improvement program funded through its Differential Fee annual budget, summer instruction anticipated profits, and operating budget. We will also allocate \$15,000 each of the first two years for digital marketing of the new program

CERTIFICATIONS:

	<u>6/18/19</u>
Primary Administrator for Proposed Certificate	Date
	<u>6/18/19</u>
Provost/Chief Academic Officer	Date
	<u>0528/19</u>
Management Board/System Office	Date

SUMMARY OF ESTIMATED ADDITIONAL COSTS/INCOME FOR PROPOSED PROGRAM

Institution: University of New Orleans

Date: 3/28/2019

Degree Program, Unit: Graduate Certificate in Machine Learning & Artificial Intelligence

FTE = Full Time Equivalent (use the institution's standard definition and provide that definition).

EXPENDITURES								
INDICATE ACADEMIC YEAR:	FIRST		SECOND		THIRD		FOURTH	
	AMOUNT	FTE	Amount	FTE	AMOUNT	FTE	AMOUNT	FTE
Faculty	\$0		\$0		\$0		\$0	
Graduate Assistants								
Support Personnel								
Fellowships and Scholarships								
SUB-TOTAL								
	AMOUNT	AMOUNT		AMOUNT	AMOUNT			
Facilities	\$	\$	\$	\$				
Equipment								
Travel								
Marketing	\$15,000		\$15,000					
Other (specify)								
SUB-TOTAL	\$		\$		\$		\$	
TOTAL EXPENSES	\$15,000		\$15,000		\$0		\$0	
REVENUES								
Revenue Anticipated From:	AMOUNT	AMOUNT		AMOUNT	AMOUNT			
*State Appropriations	\$	\$	\$	\$				
*Federal Grants/Contracts								
*State Grants/Contracts								
*Private Grants/Contracts								
Expected Enrollment	10	20	30	40				
Tuition + Fees	\$6,848x 10 = \$68,480	\$6,848x 20= \$136,960	\$6,848 x 30= \$205,440	\$6,848x 40= \$273,920				
Fees								
*Other (specify)								
TOTAL REVENUES	\$68,480	\$136,960	\$205,440	\$273,920				

* Describe/explain expected sources of funds in proposal text.

**BOARD OF SUPERVISORS FOR THE
UNIVERSITY OF LOUISIANA SYSTEM**

ACADEMIC AND STUDENT AFFAIRS COMMITTEE

August 22, 2019

Item E.8. **University of New Orleans'** request for approval of an Undergraduate Certificate in Unmanned Systems Management.

EXECUTIVE SUMMARY

The University of New Orleans is requesting approval of an Undergraduate Certificate (UC) in Unmanned Systems Management. The proposed 18 credit hour UC is designed to teach students about managing unmanned aerial, land and waterborne vehicles. Courses required of the UC include: Introduction to Unmanned Systems, Basic Project Management, Remote Pilot and Drone Applications, Ship Control Systems, Systems Engineering, and Autonomy of Ocean Vehicles. This is an interdisciplinary plan of study that incorporates existing courses from two departments within the College of Engineering.

There has been recent interest in the State of Louisiana in the development and production of unmanned systems. Companies such as Sharkteck Autonomous Vessels and Oceaneering would benefit from individuals who have knowledge and skillsets specific to the management of unmanned systems. In addition, aerial drones are being used by many surveying and mapping companies in the Gulf South region. These drones are being used to provide record topographical information, to provide details on Louisiana's coast line, and to assist farmers in inspecting fields and crops. A similar certificate program in Unmanned Aerial Systems Management is offered by the University of Louisiana at Monroe; however, that program focuses solely on aerial systems. What is proposed by UNO leverages the uniqueness of its School of Naval Architecture and Marine Engineering to include management of unmanned waterborne systems along with aerial and land systems.

RECOMMENDATION

It is recommended that the following resolution be adopted:

***NOW, THEREFORE, BE IT RESOLVED,** that the Board of Supervisors for the University of Louisiana System hereby approves the University of New Orleans' request for approval of an Undergraduate Certificate in Unmanned Systems Management.*

PROPOSAL to DEVELOP a NEW ACADEMIC CERTIFICATE PROGRAM
(CAS, PAC, UC, PBC, GC, PMC, PPC)

Date:

Campus: The University of New Orleans	Program: <u>CIP, Certificate Designation, Title 140999</u> Unmanned Systems Management
Institutional Contact Person & Contact Info (if clarification is needed)	
<p>Tina Chang, AVP of Professional and Continuing Education The University of New Orleans 2000 Lakeshore Drive, New Orleans, LA 70148 504-280-1024 tchang@uno.edu,</p> <p>Dr. Taskin Kocak, Dean, College of Engineering tkocak@uno.edu</p> <p>Dr. Brandon Taravella, Associate Professor, Naval Architecture and Marine Engineering bmtarave@uno.edu</p>	

1. Certificate Description

Describe the program concept: purpose and objectives; proposed curriculum; mode of delivery (on-site/hybrid/on-line). Indicate which courses are new; describe plan for rolling out new courses.

**** Attach catalog descriptions for the required and elective courses, including prerequisites and LCCN, when applicable. ****

The University of New Orleans proposes to introduce an undergraduate certificate in Unmanned Systems Management. The proposed curriculum is based on five existing departmental courses and one new introductory course. The proposed curriculum has been designed to teach students about managing unmanned aerial, land and waterborne vehicles.

The certificate will require the addition of one new course to the curriculum. This course ENGR 2xxx will provide an introduction to unmanned systems including the types of unmanned systems and their uses. Three courses (ENCE 3390, ENCE 4313 and NAME 4138) are existing courses. Two courses (NAME 4080 and NAME 4139) will be closely related to existing 6000 level courses.

ENCE 3390 will provide the students with a basic understanding of project management including economic analysis. ENCE 4313 and NAME 4139 will include topics unique to the design and control of aerial or waterborne vehicles. NAME 4080 will include engineering concepts for system design, and NAME 4138 will provide the students with a basic background in control systems.

Requirement	Hours
ENGR 2xxx: Intro to Unmanned Systems	3
ENCE 3390: Basic Project Management	3
ENCE 4313: Remote Pilot and Drone Applications	3
NAME 4138: Ship Control Systems	3
NAME 4080: Systems Engineering	3
NAME 4139: Autonomy of Ocean Vehicles	3

Students with limited background in mathematics may be required to complete some additional prerequisites such as MATH 2114 (4 credits), MATH 2124 (4 credits), MATH 2221 (3 credits), MATH 3511 (3 credits).

2. Need

Outline how this program is deemed essential for the wellbeing of the state, region, or academy (e.g., how is it relevant, how does it contribute to economic development or relate to current/evolving needs). Identify similar programs in the state and explain why the proposed certificate is needed.

There has been recent interest in the State of Louisiana in the development and production of unmanned systems. A few examples include:

Sharktech Autonomous Vessels: Sharktech was developed by Louisiana based company Metal Shark Boats in Jeanerette, Louisiana. Metal Shark is a leading designer and builder of custom vessels for commercial, defense, and law enforcement applications worldwide. These boats implement autonomous vessel technology into existing Metal Shark hull platforms. These boats are currently being designed by engineers in Louisiana and provided to many government and commercial agencies. (<https://www.metalsarkboats.com/autonomous-vessels/>)

Oceaneering is the world's largest manufacturer and operator of work class remote operated vehicles (ROV). These ROVs primarily operate in subsea environments to assist in oil and gas installations, search and rescue, inspections, etc. Oceaneering has a significant portion of their fleet supporting the oil and gas industry in the Gulf of Mexico.

Aerial drones are being used by many surveying and mapping companies in the Gulf South region. These drones are being used to provide record topographical information, to provide details on Louisiana's coast line, and to assist farmers in inspecting fields and crops.

A similar certificate program in Unmanned Aerial Systems Management can be found at the University of Louisiana Monroe (ULM). The certificate program proposed by the University of New Orleans should not be perceived as a duplicate because it leverages the uniqueness of its School of Naval Architecture and Marine Engineering to include management of unmanned waterborne systems along with aerial and land systems. The certificate program at ULM focuses solely on aerial systems.

3. Students

Describe student interest. Project enrollment and productivity for the first 5 years; justify projections.

The proposed program is an interdisciplinary plan of study that incorporates courses from two departments within the College of Engineering. Five of the six proposed courses are existing within the University of New Orleans curriculum. These five courses regularly experience relatively large enrollments. Introduction of this certificate will facilitate our efforts to collaborate among the various engineering disciplines. Successful accomplishment of this goal could help us increase the enrollment of the College of Engineering by 10% in the first few years.

4. Accreditation

Describe plan for achieving program accreditation.

There is no accreditation required.

5. Faculty, Administration, & Other Resources

How will instructional needs be met: will additional faculty, facilities, equipment, or library resources be required? What department will deliver and oversee the proposed program?

There will be no new faculty, facilities, equipment, or library resources. The Department of Architecture and Marine Engineering.

6. Cost

Summarize additional costs to offer the program. On separate budget sheet, estimate costs and revenues for the projected program for the first four years, indicating need for additional appropriations (if any).

There will be no additional cost required.

CERTIFICATIONS:

Tina Chang

Primary Administrator for Proposed Certificate
Mahyar Amazejar

Provost/Chief Academic Officer
[Signature]

Management Board/System Office

____7/24/2019
Date
____7/24/2019
Date
[Signature]
Date

SUMMARY OF ESTIMATED ADDITIONAL COSTS/INCOME FOR PROPOSED CERTIFICATE

Institution: The University of New Orleans _____

Date: July 24, 2019 _____

Certificate Program, Unit: 140999_Unmanned Systems Management _____

FTE = Full Time Equivalent (use the institution's standard definition and provide that definition).

EXPENDITURES								
	FIRST YEAR		SECOND YEAR		THIRD YEAR		FOURTH YEAR	
	AMOUNT	FTE	Amount	FTE	AMOUNT	FTE	AMOUNT	FTE
Faculty	\$0		\$0		\$0		\$0	
Graduate Assistants								
Support Personnel								
Fellowships and Scholarships								
SUB-TOTAL EXPENSES	\$0		\$0		\$0		\$0	
	AMOUNT		AMOUNT		AMOUNT		AMOUNT	
Facilities	\$0		\$0		\$0		\$0	
Equipment								
Travel								
Supplies								
SUB-TOTAL	\$0		\$0		\$0		\$0	
GRAND TOTAL EXPENSES	\$0		\$0		\$0		\$0	
REVENUES								
Amount & Percentage of Total Anticipated From:	AMOUNT	%	AMOUNT	%	AMOUNT	%	AMOUNT	%
State Appropriations	\$		\$		\$		\$	
Federal Grants/Contracts								
State Grants/Contracts								
Private Grants/Contracts								
Tuition	\$9,469		\$18,940		\$28,409		\$37,845	
Fees	\$3,771		\$7,540		\$11,131		\$15,080	
Other (specify)								
TOTAL	\$13,240		\$26,480		\$39,540		\$52,925	

**BOARD OF SUPERVISORS FOR THE
UNIVERSITY OF LOUISIANA SYSTEM**

ACADEMIC AND STUDENT AFFAIRS COMMITTEE

August 22, 2019

Item E.9. **University of Louisiana System's** request for approval of System Universities' 2019-20 Promotions in Faculty Rank and Recommendations for Tenure.

EXECUTIVE SUMMARY

Annually each UL System campus submits recommendations for promotions in faculty rank and tenure. This year, 127 faculty members were recommended for promotion in rank, with 68 faculty members recommended for tenure.

With respect to promotion in rank, 58 faculty members across the UL System were recommended for promotion to the rank of Professor and 69 to the rank of Associate Professor. Our review suggests that the recommended faculty met all respective guidelines.

A total of 68 faculty members across the System were recommended for tenure and rationales were provided for the 12 faculty members to whom "early" tenure was recommended (i.e., before the six-year probationary term). In these cases, exceptions were considered on the basis of outstanding performance and/or early tenure review was a condition of acceptance of employment. Board policy provides for such exceptions.

RECOMMENDATION

It is recommended that the following resolution be adopted:

NOW, THEREFORE, BE IT RESOLVED, that the Board of Supervisors for the University of Louisiana System hereby approves System Universities' 2019-20 Promotions in Faculty Rank and Recommendations for Tenure.

UNIVERSITY OF LOUISIANA SYSTEM

Promotions and Tenure
2019-20

Institutions	Promotions				Tenure	
	To Associate		To Professor		No.	Tenure Rate
	No.	% at rank	No.	% at rank		
Grambling State University	3	22.3%	2	18.8%	5	48.7%
Louisiana Tech University	6	27.3%	7	20.1%	9	49.0%
McNeese State University	6	18.5%	7	20.1%	7	53.8%
Nicholls State University	8	25.0%	2	14.0%	9	42.0%
Northwestern State University	17	25.0%	6	20.0%	8	46.0%
Southeastern Louisiana University	9	19.0%	8	23.0%	9	40.0%
University of Louisiana at Lafayette	12	20.8%	8	25.3%	14	48.5%
University of Louisiana at Monroe	6	23.2%	9	20.3%	5	48.0%
University of New Orleans	2	26.0%	9	34.0%	2	60.0%
UL System Totals	69		58		68	

Approved by the Board of Supervisors
for the University of Louisiana System

on 8/27/19

By: [Signature]

**BOARD OF SUPERVISORS FOR THE
UNIVERSITY OF LOUISIANA SYSTEM**

FACILITIES PLANNING COMMITTEE

August 22, 2019

Item G.7. University of Louisiana System's request for approval of the Fiscal Year 2020-21 Capital Outlay Budget Request and Institutions' Five-Year Capital Outlay Plans.

EXECUTIVE SUMMARY

UL System requests approval of the Fiscal Year 2020-21 Capital Outlay Budget Request and Institutions' Five-Year Plans for FY 2020-21 through FY 2024-25.

The Capital Outlay Budget Request contains a prioritized list of System and Campus projects separated into four categories, Emergency, Self-Generated Revenue, Continuing, and New.

Once approved by the Board, the Capital Outlay Budget Request for FY 2020-21 will be forwarded to the Board of Regents for approval and submittal to the Division of Administration (Facility Planning and Control) for consideration in next year's state capital outlay budget.

RECOMMENDATION

It is recommended that the following resolution be adopted:

NOW, THEREFORE, BE IT RESOLVED, that the Board of Supervisors for the University of Louisiana System hereby approves the Fiscal Year 2020-21 Capital Outlay Budget Request and Institutions' Five-Year Capital Outlay Plans.

**BOARD OF SUPERVISORS FOR THE
UNIVERSITY OF LOUISIANA SYSTEM**

FINANCE COMMITTEE

August 22, 2019

- Item H.6.** **University of Louisiana System's** request for acceptance of Fiscal Year 2018-19 Financial and Compliance and Federal Award Programs Representation Letters for (a) Grambling State University, (b) Louisiana Tech University, (c) Nicholls State University, (d) Northwestern State University, (e) Southeastern Louisiana University, (f) University of Louisiana at Lafayette, (g) University of New Orleans, and (h) University of Louisiana System.

EXECUTIVE SUMMARY

In connection with its financial and compliance audits of colleges and universities, the Legislative Auditor's Office requires the President and Chief Fiscal Officer to review certain representations and certify that those representations are true and correct. The officers answer and sign a financial and compliance and federal award programs questionnaire at the beginning of the audit and then sign an update upon conclusion of the audit certifying that: (1) there were no material changes to the original certification; or (2) any such changes have been disclosed to the Legislative Auditor. Office of Legislative Auditor policy further requires that the appropriate management board accept the university's questionnaire in a public meeting. The documentation is available in the System Office.

RECOMMENDATION

It is recommended that the following resolution be adopted:

NOW, THEREFORE, BE IT RESOLVED, that the Board of Supervisors for the University of Louisiana System hereby accepts Fiscal Year 2018-19 Financial and Compliance and Federal Award Programs Representation Letters for (a) Grambling State University, (b) Louisiana Tech University, (c) Nicholls State University, (d) Northwestern State University, (e) Southeastern Louisiana University, (f) University of Louisiana at Lafayette, (g) University of New Orleans, and (h) University of Louisiana System.

Approved by the Board of Supervisors
for the University of Louisiana System

on 8/27/19

By: [Signature]

Edwin Litloff, Vice President
for Business and Finance

**BOARD OF SUPERVISORS FOR THE
UNIVERSITY OF LOUISIANA SYSTEM**

FINANCE COMMITTEE

August 22, 2019

- Item H.7.** University of Louisiana System's request for approval of Fiscal Year 2019-20 Operating Budgets, including organizational charts, undergraduate/graduate mandatory attendance fees, scholarships, and System Shared Costs.

EXECUTIVE SUMMARY

The 2019-20 Operating Budgets were prepared in accordance with instructions received from the System Office, the Division of Administration Office of Planning and Budget, and the Louisiana Board of Regents.

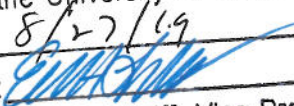
System staff has prepared a comparative Operating Budget Summary for the System including Revenues by Source, Expenditures by Function and Object, and other summary data on Mandatory Attendance Fees, Organizational Charts, Employees, Scholarships, and Athletic Budgets.

Informational items are included in each institution's full operating budget document that will be available at the Board meeting.

RECOMMENDATION

It is recommended that the following resolution be adopted:

***NOW, THEREFORE, BE IT RESOLVED,** that the Board of Supervisors for the University of Louisiana System hereby approves Fiscal Year 2019-20 Operating Budgets, including organizational charts, undergraduate/graduate mandatory attendance fees, scholarships, and System Shared Costs.*

Approved by the Board of Supervisors
for the University of Louisiana System
on 8/22/19
By: 
Edwin Litloff, Vice President
for Business and Finance

