

July 28, 2020

Dr. James D. Fielder, Jr. Secretary of Higher Education Maryland Higher Education Commission 6 North Liberty Street Baltimore, MD 21201

Dear Dr. Fielder:

I am seeking your approval to offer a Masters of Science in Polymer and Materials Sciences at Coppin State University (CSU). The new degree will be a total of 36 credits and its proposed codes are CIP 40.1001 and program code 0915.00. The program will contribute to STEM, workforce and innovation, and economic growth goals of Maryland as identified in the University System of Maryland's Strategic Plan.

The proposal has the approval of appropriate campus committees and was submitted to me for my endorsement. I am pleased to recommend this proposal and request your approval. Should you have any questions, please contact me or my staff. Additionally, you may contact Dr. Leontye Lewis, Provost and Vice President for Academic Affairs.

Sincerely,

Anthony L. Jenkins, Ph. D.

Anthony L. Jenkins, Ph. President

cc: Dr. Leontye L. Lewis, Provost & Vice President for Academic Affairs
 Dr. Antoinette Coleman, Associate Vice Chancellor for Academic Affairs
 Dr. Emily A. A. Dow, Assistant Secretary
 Dr. James Takona, Dean, College of Arts and Sciences & Education
 Mr. Michael W. Bowden, Assistant Vice President for Planning & Assessment



Cover Sheet for In-State Institutions New Program or Substantial Modification to Existing Program

Office Use Only: PP#

Institution Submitting Proposal	Coppin State University				
Each action	below requires a separate proposal and cover sheet.				
• New Academic Program	O Substantial Change to a Degree Program				
O New Area of Concentration	O Substantial Change to an Area of Concentration				
O New Degree Level Approval	O Substantial Change to a Certificate Program				
O New Stand-Alone Certificate	O Cooperative Degree Program				
O Off Campus Program	O Offer Program at Regional Higher Education Center				
Payment O Yes Payment O Submitted: O No Type: 0	Image: R*STARSPayment PaymentDate Submitted:07/20/20O CheckAmount:Submitted:				
Department Proposing Program	Natural Sciences				
Degree Level and Degree Type	Masters of Science				
Title of Proposed Program	Polymer and Materials Sciences				
Total Number of Credits	36				
Suggested Codes	HEGIS: 0915.00 CIP: 40.1001				
Program Modality	On-campus O Distance Education (<i>fully online</i>)				
Program Resources	O Using Existing Resources O Requiring New Resources				
Projected Implementation Date	O Fall O Spring O Summer Year:2021				
Provide Link to Most Recent Academic Catalog	URL: www.coppin.edu/catalogs				
	Name: Michael Bowden				
	Title: Asst. Vice President for Planning & Assessment				
Preferred Contact for this Proposal	Phone: 410-951-3010				
	Email: mbowden@coppin.edu				
	Type Name: Leontye Lewis, Ed. D., Provost & VPAA				
President/Chief Executive	Signature: Jostre Rews Date: >/3/ poso				

Date of Approval/Endorsement by Governing Board:

Revised 4/2020

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UNIVERSITY SYSTEM OF MARYLAND INSTITUTION PROPOSAL FOR

Х	New Instructional Program
	Substantial Expansion/Major Modification
	Cooperative Degree Program
Х	Within Existing Resources, or
	Requiring New Resources
	-

Coppin State University

Institution Submitting Proposal

M.S. in Polymer and Materials Sciences

Title of Proposed Program

Master of Science Award to be Offered

Projected Implementation Date

Fall 2020

0915.00

Proposed HEGIS Code

Natural Sciences Department in which program will be located

410-951-4139

Contact Phone Number

Signature of President or Designee

40.1001

Proposed CIP Code

Dr. Mintesinot Jiru Department Contact

mjiru@coppin.edu Contact E-Mail Address

Date

A. Mission-Centrality to Institutional Mission and Planning Priorities

1. Program description and alignment with Mission of CSU:

The mission of Coppin State University (CSU) is to educate a multi-generational student population and to provide innovative education opportunities while promoting lifelong learning. The university fosters leadership, social responsibility, civic and community engagement, cultural diversity and inclusion, and economic development. The major academic programs of the institution that impact the communities are in Education, Health Care, and in the Science, Technology, Engineering & Mathematics (STEM) disciplines. Focus primarily on these disciplines prepares students to be competitive in the state, region, nation, and world employment markets.

2. Strategic Plan of CSU:

The strategic plan of CSU states that "Coppin will continue to identify and offer other academic programs designed to alleviate key workforce shortages such as those in STEM and cyber security. The University aims to continue promoting graduate and professional education among its students to be more competitive in the workforce. This goal includes promoting a culture of innovation and entrepreneurship in a variety of disciplines that can lead to collaborative initiatives among faculty and academic units for partnerships external to the university."

3. Congruence with Mission:

In congruence with the mission of Coppin State University, the Department of Natural Sciences is dedicated to fostering instruction and research in selected areas of STEM, supported by excellent educational centers, which act as incubators for research-technology on biomaterials, renewable fuels, biomarkers environmental toxins and nano-technology. The proposed Polymers and Materials Sciences (PMS) program is aligned with the University priorities for its academic programs' enhancement and development as an initiative directed to support Maryland's future workforce demands as identified by the USM Board of Regents. In this regard, the PMS program is considered an expansion and addition to Coppin's graduate programs, which include Education, Nursing, Human Services Administration, Criminal Justice, and others that meet the USM mission in preparing professionals with high quality training that improves Maryland's skilled workforce and meets its future demands.

4. Description of Institution's Commitment:

a) Ongoing administrative, financial, and technical support of the proposed program

The institution is committed to provided necessary resources as evidence by other programs. The program is committed to a regular review of program viability and will provide or allocate appropriate resources to ensure the success of the programs.

b) Continuation of the program for a period of time sufficient to allow enrolled students to complete the program.

The institution is committed to allowing the program to function for period of time sufficient for students to complete the program. The university has a rich history of program longevity but is also committed to the success of students and ensuring the efficient operation of programs.

B. Critical and compelling regional or Statewide need as identified in the State Plan:

1. Demonstrate demand and need for the program in terms of meeting present and future needs of the region and the State in general based on one or more of the following:

a) The need for the advancement and evolution of knowledge

The proposed PMS graduate program is believed to address the local and state-wide workforce demands that according to the Maryland Department of Labor, Licensing and Regulation to over 6000 workers are needed by 2024.

b) Societal needs, including expanding educational opportunities and choices for minority and educationally disadvantaged students at institutions of higher education.

The PMS graduate program will address the need for students in the inner City of Baltimore to have greater access to graduate degrees. There is a significant deficit of minorities in this field. The program will ensure equal opportunity for Maryland's diverse citizenry through education and by creating a pipeline to graduate degrees that will increase the number of minority professional workers.

c) The need to strengthen and expand the capacity of historically black institutions to provide high quality and unique educational programs.

The proposed program is unique to Coppin and doesn't exist in any of the Historically Black Institutions in Maryland. This new graduate program will provide Coppin State University, a Historically Black University, the opportunity to have its first STEMrelated graduate program.

Provide evidence that the perceived need is consistent with the <u>Maryland State Plan</u> for Postsecondary Education (pdf).⁴

The **State Plan Strategy 10** indicates an intent to "expand support for research and research partnerships". The proposed PMS graduate program will provide the opportunity for faculty to be innovative, i.e. to explore, challenge and implement new ideas. Faculty will have an opportunity to license and patent new polymers and material sciences products while encouraging and supporting students with early research experiences.

The **State Plan Strategy 11** is designed to "encourage a culture of risk-taking and experimentation". The proposed PMS graduate program will encourage risk-taking as an innovative strategy in research. Students will be taught to gain knowledge from success as well as failure of their research projects.

C. Quantifiable & reliable evidence and documentation of market supply & demand in the region and State

1. Describe Potential Industries and Employment Opportunities:

According to the job-search firm, Indeed, polymers and material science job openings are expanding faster than the number of technologists looking for them. According to the Maryland Department of Labor, Licensing and Regulation, workforce needs in the polymer manufacturing industry by the year 2024 will total over 6,000 workers (table below). Graduates of this program will fill the critical need for trained labor by government agencies and manufacturing companies such as Lockheed Martin, Under Armor, Berry Plastics and NGK-locke, Inc. Positions within these firms are entry-level and mid-managerial levels.

2. Data

Region	Number of workforce demands			
Baltimore City	906			
Mid-Maryland	843			
Baltimore County	289			
Susquehanna	2796			
Western Maryland	1538			
Total	6372			

3. Evidence of Market Surveys:

The Department of Natural Sciences conducted a survey that was conducted internally and externally to determine demand for the new program. The initial survey administered throughout its department determined that current undergraduates within existing biology and chemistry programs would be interested in obtaining the new degree. Also, exit surveys revealed that Coppin's graduates within the natural sciences desired to remain at the university and pursue relevant graduate degrees if they were available as offerings.

4. Data of current and projected supply of students:

Survey results indicated that there would be 10 or more undergraduate students who would enroll in the first year of the program and by year 5, more than 25 undergraduate students are expected to be enrolled and on a path to graduation, contingent upon full

approval to offer the program. This information is supplied in the resources and expenditure section of the proposal.

D. Reasonableness of program duplication:

1. Identify similar programs in the State and/or same geographical area. Discuss similarities and differences between the proposed program and others in the same degree to be awarded.

No other institution within the USM offers this program. University of Maryland College Park offers a degree in Materials Science and Engineering. UMBC offers a degree in Chemical and Biochemical Engineering. The PMS program will prepare students to meet the future work force demands in polymer and materials sciences.

2. Provide justification for the proposed program.

The program will strengthen CSU's engagement with Baltimore's educational needs and establish a fruitful partnership with the local and state industry, by providing research and technological innovations that are highly demanded by the manufacturing enterprise. CSU partners who are familiar with the competencies of our undergraduates are expecting them to be further trained by us and prepared for the STEM careers they will offer.

E. Relevance to High Demand Programs at Historically Black Institutions (HBIs)

1. Discuss the program's potential impact on the implementation or maintenance of high-demand programs at HBI's.

This new PMS graduate program will provide Coppin State University, an HBCU, the opportunity to have its first high quality and unique STEM related graduate program. This program meets the social needs including expanding educational opportunities and choices for minority and educationally disadvantaged students at CSU and the city of Baltimore. The PMS graduate program is more affordable than the graduate programs offered by any other USM institutions.

F. Relevance to the Identity of Historically Black Institutions (HBIs)

1. The new program is being proposed at a USM HBI and is will assist the university in meeting its stated mission.

G. Adequacy of Curriculum Design, Program Modality, and Related Learning Outcomes:

1. Description of the program's establishment and faculty overseeing instruction of the program

The Polymer and Material Sciences program (PMS) was established to facilitate a valueadded engagement between Coppin State University (CSU) and our prospective industrial

partners, such as Lockheed Martin, Under Armor and Northrop Grumman, with the ultimate objective of accelerating research and technological innovations that are highly needed by local and state manufacturing enterprise. The Program is uniquely designed to give students an understanding of design, synthesis, characterization, and function in a large number of materials. Students will receive an in-depth understanding of the relationships between the structure and properties of materials and a selection of research areas driven by industry-university partnerships with a focus on themes relevant to the polymers and materials industry. To this end, industry partners will have (i) direct input on the research directions funded through the PMS, (ii) participation and engagement with faculty during regular meetings, (iii) strengthen the opportunity to hear and see new capabilities and toolsets from synthesis to characterization to processing-application of new or improved materials and polymers with added value, and (iv) providing internship experiences for students pursuing their MS in polymers and materials. By 2030, polymers, material composites, the automotive industry, and society at large will recognize plastics and polymer composites as preferred material solutions that meet, and in many cases establish, the needs of environmental sustainability. Despite this predicted need, many of the existing engineering trainings focus on metals and little, if not no attention is given to plastics and polymer composites. As a result, today's engineering workforce largely lacks the knowledge to confidently make automotive, defense, aviation, medicinal devices, dentistry composites and soft sportswear design changes using polymers and new materials. The proposed PMS graduate program is designed to address local and state-wide workforce demands in the polymer manufacturing industry.

2. Describe the educational objectives and intended student learning outcomes.

Program Educational Objectives

Graduates of the program will be able to do the following: 1) demonstrate the knowledge and skills central to polymer and materials sciences; 2) discover relationships and insights in developing new polymer and material sciences products; 3) Learn cutting edge techniques and methodologies in this discipline; 4) apply the knowledge and skills in developing a master thesis; and 5) effectively and competitively pursue careers to meet the growing workforce demand in the state of Maryland and the Nation.

3. Assessment of Student Learning Outcomes

Coppin students' experiences and instruction will be anchored within an academic framework of the University's Student Learning Outcomes (SLOs) such as Oral and Written Communication and Analytical Reasoning. These SLOs, by definition, represent the university's commitment to provide students with academic experiences that support their ability to write clear expository and persuasive prose; to use valid research-based arguments as support for their written or oral positions; to express their ideas in language that is both appropriate to the topic and for the target audience, and to write and speak proficiently for those various audiences. Moreover, students will be trained to apply classical and/or current theories and principles from specific content areas; to use critical judgments from a combination of evidences and assumptions to reach viable conclusions; and to collect, analyze, and interpret data via computational literacy and scientific

reasoning.

4. List of Courses

The proposed program in Polymers and Material Sciences will have a total of 36 credits: Core courses (20 credits), Electives (10 credits) and Thesis (6 credits).

Core Courses (20 Credits)

Polymer Nanoparticles: Synthesis and Applications (CHEM- 501) – 4 credits

Course Description

This course explains, develops skills in cutting edge technology for polymer nanoparticle characterization and properties measurement utilizing state of the art tools for specific purposes. Prerequisite: A course in Nanotechnology or Advanced Inorganic Chemistry or Organic Chemistry II.

Computational Chemistry (CHEM 502) - 4 credits

Course Description

Exploration of contemporary technology used to access molecular modeling and computational chemistry with topics that include calculation of molecular structures using both classical mechanics and quantum mechanics. Prerequisite: Permission of the instructor.

Foundation of Biomaterials (CHEM 531) – 4 credits

Course Description

This course emphasizes topics related with solid/liquid/gel state matter; molecular 2D, 3D atomic assembly, macromolecules with dipolar and quadrupolar moment, synthesis/characterization of polymers its molecular mass. Analysis of hydrophobic effects, stretching, collapse, swelling and shape changing. Prerequisites: Organic Chemistry II or Advanced Inorganic Chemistry or General Physics II.

Thermodynamics of Polymer (CHEM 571) - 4 credits

Course Description

This course is intended to provide an overview of the thermodynamic principles that can apply to polymer characterization strategies leading to evaluation of material properties and possible applications for different classes of polymers (organic, inorganic) discovered previously or currently under development. Prerequisites: Physical Chemistry or General Physics II or Advanced Inorganic Chemistry

Polymer Chemistry I (CHEM 590) - 4 credits

Course Description

This course focuses on the properties of polymerization techniques in solution, emulsion, microemulsion and characterization and overview of the properties of commercial polymers with emphasis on the interrelations between molecular and gross physical

properties; polymer structure; methods of polymerization; polymer development; and Industrial applications for polymers. Prerequisites: Organic Chemistry or equivalent and permission of the instructor.

Elective Courses (10 Credits)

Advanced Instrumentation (CHEM- 510) – 2 credits **Course Description**

A course that explains the theory and operation of instruments used to characterize matter. This course is available to students in the advanced MS chemistry or material science programs. Prerequisite: Permission of the instructor.

Electrochemistry for Polymers and Materials (CHEM 511) – 2 credits **Course Description**

The Electrochemistry of polymers course is intended to provide an overview of the thermodynamic principles that can be applied for polymers characterization strategies that leads to evaluate its material properties and possible applications for different classes of polymers (organic, inorganic) discovered previously or currently under development. Perquisites: Physical Chemistry or General Physics II or Advanced Inorganic Chemistry

Advanced Polymer Chemistry (CHEM 591) – 4 credits

Course Description

This course studies the most common synthetic methods used in polymerization, the basic differences in the kinetics of these methods, the final products obtained, and the synthetic processing techniques that are currently used for various applications. Pre-requisites: Organic Chemistry and Physical Chemistry

Biomarkers and Molecular Diagnostic (BIOL 506) – 4 credits

Course Description

This course is designed to understand detailed biochemical, molecular, and cell biological approaches used in the diagnosis of various abnormalities in human population by using nucleic acids, protein, carbohydrate and lipid–based biological markers. This course covers the basic principles of molecular biology and examines their relevance to the identification of disease-causing genes/mutations and the diagnosis of human genetic disorders.

Thesis (CHEM 550) - 6 credits

Course Description

An independent, original, and scholarly research investigation is required for an M.S. Degree in Polymer and Materials Sciences. The thesis must be written using APA format. Prior to conducting the thesis work, a proposal must be submitted to the Polymer and Materials Sciences program office using forms specified by the school of graduate studies. The proposal will then be reviewed by the student's research advisor(s) and thesis committee. A candidacy exam of the thesis proposal will be administered in the fall of the

second year of the program. The graduate program coordinator will submit his/her recommendation to the Chair of the Natural Sciences Department and the Dean of Graduate Studies for approval.

5. Meeting General Education Requirements

a. The proposed program is a graduate level degree. Students admitted into this program are expected to have met all General Education Requirements of a receiving institution and shall demonstrate the credentials by providing evidence of a bachelor's degree.

b. Identify Any Specialized Accreditation of Graduate Certification Requirements

Currently, there are no specialized accreditation requirements established for the program, nor any graduate certification requirement.

6. Contracting with Another Institution

The university is not contracting with another institution or non-collegiate organization to administer this program.

7. Assurance and Evidence that the Proposed Program will Provide Clear, Complete Information on the Curriculum and Course Requirements

The Polymer and Materials Sciences (PMS) program is designed to give students an understanding of design, synthesis, characterization, and function that leads to an indepth understanding of the structure–property relationships in a large number of materials. Specifically, this program will focus on a broad class of materials classified as biomaterials, bioplastics, biofuels, nanomaterials, nanocomposites, biomarkers, and soft polymers (polyester, gel, oil and resins). This program will be advertised in the university's graduate catalog to show that it consists of a total of 36 credits, with 30 credits of core and elective courses and 6 research credits for a thesis. A pre-thesis written proposal should be submitted to the advisor (submission at the end of spring semester of the first year). The Graduate Catalog will also provide notice that a written thesis must exhibit an advanced level of understanding of the principles of materials and/or polymer science that was developed in the courses and in specialized research reading. A final thesis describing the research in a scholarly manner is required to fulfill the requirements of the program. Students in the program will also be invited to special brown bag student informational sessions throughout the academic year.

8. Assurance of Advertising, Recruiting, and Admissions Materials Represent the Program and Services Available

The program will be advertised within the Graduate Catalog along with the appropriate student supports. As appropriate, the catalog will direct students for academic advising, disability, and counseling services should the need arise.

H. Adequacy of Articulation

To date, there have been no articulation agreements. However, should the need arise for partnerships and other collaborative opportunities, the university will commit resources to ensure partnerships that have a positive impact on student success and contribute to the STEM are forged.

I. Adequacy of faculty resources (as outlined in COMAR 13B.02.03.11).

1. Provide a brief narrative demonstrating the quality of program faculty. Include a summary list of faculty with appointment type, terminal degree title and field, academic title/rank, status (full-time, part-time, adjunct) and the course(s) each faulty member will teach.

Current chemistry faculty in the Polymer and Materials Sciences (PMS) Graduate Program

Dr. Fred L. Nesbitt, Professor, Ph.D., Physical Chemistry, Full time, courses: CHEM. 502 and CHEM 510

Research interest: Dr. Nesbitt is a physical chemist in the Department of Natural Sciences. His research areas have included combustion chemistry, atmospheric chemistry, planetary chemistry and medicinal chemistry. Dr. Nesbitt's current research interest is in the application of computational chemistry to calculate physical, chemical, and spectroscopic properties of molecules. He is currently using computational chemistry to investigate the properties of Avigan. This compound is used in the treatment of influenza. In 2014 it was used in the treatment of Ebola. He is also investigating applications of computational chemistry to dye sensitized solar cells.

Dr. Hany F. Sobhi, Professor, Ph.D., Organic Chemistry, Full time, course: CHEM 590 *Research interest:* The primary objective of Dr. Sobhi's research is to develop strategies to synthesize small bio-organic molecules that can be used for clinical diagnosis (biomarkers) and understand the pathogenetic mechanisms underlying the clinical manifestations of diseases. The secondary objective of his research is focused on planetary and space science and the development of a mechanism for of the formation of organic carbonaceous molecules in Solar Nebula. Dr. Sobhi is also interested in the development bio-active organic scaffolds for more efficient drug delivery that targeted hepatic therapy and the development of intelligent carrier using Nano technology.

Dr. Tulio Chavez-Gil, Associate Professor, Ph.D., Inorganic chemistry, Full time, courses: CHEM 511, CHEM 531, CHEM 571

Research interest: Dr. Tulio Chavez-Gil is an Assistant Professor of Chemistry and the Director of the Renewable Fuels and Advanced Inorganic/Organometallic Chemistry Laboratory in the Department of Natural Sciences. His research interests include the synthesis of organometallic compounds for use in dye sensitized solar cells and the synthesis and characterization of renewable fuels. Dr. Chavez-Gil has participated in and co-organized national/international scientific meetings in Inorganic Chemistry, Bio-material Sciences, Pharmaceutical Sciences, Energy-Food Nexus, Energy & Fuels, Artificial Antibiotics, and Algae Biodiesel technologies. Dr. Chavez-Gil was recently awarded a Patent (# 9,259, 666) for a state-of-the art invention by the U.S. patent office.

Dr. Jamal Uddin, Professor, Ph.D., Physical Chemistry, Full time, course: CHEM 501 Research interest: Dr. Jamal Uddin is a Professor at Coppin State University in the Department of Natural Sciences in Baltimore, Maryland. He is the founder and director of the Center for Nanotechnology. In addition, he was the two-time recipient (2013-14) of the Wilson Elkins Professorship award from University System of Maryland. He has been teaching chemistry, physical science, environmental science, and nanotechnology since 2005 in the Department of Natural Sciences. He has participated in many national and international chemistry symposiums and seminars. Dr. Uddin's research interest includes the areas of Solar Energy, Laser Photochemistry, Nanotechnology, Quantum dots, and Single molecule imaging spectroscopy; Terahertz spectroscopy and Metal enhance fluorescence. His field of expertise includes the development of Natural Dye Sensitized Solar Cell (DSSC), synthesis and excited state properties of Polymetallic Complexes used in charge separation and chemical fuel production, along with synthesis of organic and inorganic molecules. Some of his significant publications focused on Electron Transfer Chemistry in Donor-Acceptor complexes and Dye Sensitized Solar Cell. He is a member of the American Chemical Society (ACS) and the Inter-American Photochemical Society (I-APS). He is a corresponding secretary of the American Association of University Professors (AAUP) at Coppin State University, Maryland chapter.

Additional Faculty: new faculty will need to be hired with a Ph.D. in Polymer Chemistry to teach courses such as CHEM 591 and guide the thesis process for graduate students.

J. Adequacy of library resources (as outlined in COMAR 13B.02.03.12).

1. The Library supports the instructional program and provides an environment conducive to general intellectual enrichment and continued learning. The library provides space for classrooms, computer classrooms, meetings, visual exhibits, special programs and receptions, and offices. The library has over 40 public workstations to allow access to the Internet and various other networked resources.

Parlett L. Moore Library is a member of the Library Information Management System (LIMS) of the University System of Maryland and Affiliated Institutions (USMAI), a collaborative effort that permits state higher education institutions to share resources. LIMS provides a USMAI union on-line public access catalog that contains more than 1,400,000 titles. The library will provide the necessary literature and educational resource materials for the proposed program.

K. Adequacy of physical facilities, infrastructure and instructional equipment (as outlined in COMAR 13B.02.03.13)

1. The PMS graduate program will be housed in the newly built Science and Technology Center (STC). STC has state-of-the-art technology for research and instruction. The chemistry program has three specialized Centers/Labs in the STC building: Organic Synthesis center, Nanotechnology center and Renewable Fuels and Advanced Inorganic/Organometallic Laboratory. These centers are equipped with advanced instruments such as 400 MHz NMR, atomic force microscope (AFM), Transmission electron microscope (TEM), Teraherz microscope (THz). There are also numerous other instruments for chemical characterization, such as Thermofisher FTIR, Raman spectrometer, UV-VIS spectrometer, mass spectrometers, Atomic absorption spectrometer (AA), and Circular Dichroism spectrometer.

 Students enrolled in the program are assigned an email address, access to the institution's Learning Management System, Blackboard, and all other appropriate platforms to support the student's experience. Additionally, students are able to access 24/7 OIT Student Help desk should needs arise using any of the technology.

L. Adequacy of financial resources with documentation (as outlined in COMAR 13B.02.03.14)

The PMS program will be housed in the newly built Science and Technology Center (STC) building. The STC has state-of-the-art technology for classrooms and laboratories. Delivery of the program will be in existing space and is not contingent on additional funds.

The Department of Natural Sciences is having discussions with NSF to establish a Center of Research Excellence in Science and Technology (CREST) at Coppin State University. Funds from this program will be used to support the PMS program.

TABLE 1: RESOURCES					
Resources Categories	(Year 1)	(Year 2)	(Year 3)	(Year 4)	(Year 5)
1.Reallocated Funds ¹	0	0	0	0	0
2. Tuition/Fee Revenue ²	36816	149621	273016	729448	1421914
(c+g below)					
a. #F.T Students	3	4	8	11	14
b. Annual Tuition/Fee	7901	7901	7901	7901	7901
Rate					
c. Annual Full Time	23703	31604	63208	86911	110614
Revenue (a x b)					
d. # Part Time Students	1	3	4	7	10
e. Credit Hour Rate	4371	4371	4371	4371	4371
f. Annual Credit Hours	3	9	12	21	30
g. Total Part Time	13113	118017	209808	642537	1311300
Revenue (d x e x f)					

3. Grants, Contracts, &	50,000	50000	100000	0	0
Other External					
Sources ³					
4. Other Sources	0	0	0	0	0
TOTAL (Add 1 - 4)	86,816	199,621	373,016	729,448	1,421,914

¹ Whenever reallocated funds are included among the resources available to new programs, the following information must be provided in a footnote: origin(s) of reallocated funds, impact of the reallocation on the existing academic program(s), and manner in which the reallocation is consistent with the institution's strategic plan.

² This figure should be a realistic percentage of tuition and fees which will be used to support the new program. Factors such as indirect costs linked to new students and the impact of enrolling continuing students in the new program should be considered when determining the percentage.

³ Whenever external funds are included among the resources, the following information must be provided in a footnote: source of the funding and alternative methods of funding the program after the cessation of external funding.

TABLE 2: EXPENDITURES					
Expenditure Categories	(Year 1)	(Year 2)	(Year 3)	(Year 4)	(Year 5)
1. Total Faculty Expenses	91780	91780	149750	156400	216390
(b + c below)					
a. # FTE	1	1	2	2	3
b. Total Salary	70000	70000	125000	130000	189000
c. Total Benefits	21780	21780	24750	26400	27390
2. Total Administrative					
Staff Expenses (b + c below)					
a. # FTE	0.5	0.5	0.5	1	1
b. Total Salary	18000	18000	18000	36000	36000
c. Total Benefits	1440	1440	1440	2880	2880
3. Total Support Staff					
	0	0	0	0	0
Expenses (b + c below)					
a. # FTE	0	0	0	0	0
b. Total Salary	0	0	0	0	0
c. Total Benefits	0	0	0	0	0

4. Equipment	0	0	0	0	0
5. Library	125	125	0	0	0
6. New or Renovated Space	0	0	0	0	0
7. Other Expenses	0	0	0	0	0
TOTAL (Add 1 - 7)	91905	91905	149750	156400	216390

M. Adequacy of provisions for evaluation of program (as outlined in COMAR 13B.02.03.15).

- 1. The curriculum, program faculty, and student learning outcomes will be routinely evaluated throughout the semester, annually, and as required by the USM's periodic review process. The program, courses, and faculty will be evaluated using student surveys and program committee reviews on a regular basis. The faculty are also evaluated by Department Chair and peers. The graduate curriculum and assessment tools will be reviewed every five years to determine effectiveness in achieving the proposed program's objectives and outcomes.
- 2. The Institution through the Assessment Committee will evaluate academic programs for their impact on teaching and learning, and student success. A comprehensive assessment system and process has been established by the acquisition of a new software platform and evaluation committees charged by the institution's President and Chief Academic Officer.

N. Consistency with the State's minority student achievement goals (as outlined in COMAR 13B.02.03.05 and in the State Plan for Postsecondary Education).

1. According to Maryland State Plan for Postsecondary Education, reducing the achievement gap and providing access are important goals not only because they help remedy persistent social inequalities, but also because they improve the overall educational attainment of the State's population. The program will work to help increase student success and help students improve their workplace competitiveness and reach their professional goals. This aim is consistent with the **State's minority student achievement goals**.

The **State Plan Strategy 8** calls for Universities to "develop new partnerships between colleges and businesses to support workforce development and improve workforce readiness". The Masters in Polymers and Materials Sciences (PMS) program is designed to facilitate a value-added engagement between Coppin State University (CSU) and our prospective industrial partners (such as Lockheed Martin, Under Armor and Northrop Grumman) with the ultimate objective of accelerating research and technological innovations that are highly needed by local and state manufacturing enterprise.

Programs that Address Cultural Diversity

CSU is uniquely capable of addressing the preparation of multigenerational students from the State of Maryland, Baltimore City and County, and regions beyond. The University extends its preparations beyond the traditional classroom by providing experiential and authentic learning experiences to students who have been differently prepared. To address the cultural diversity goals of the USM, the university has aligned its plan to help the system meet its goals accomplish greater diversity and inclusion. Data below and explanations show progress towards greater diversity and inclusion.

Selected initiatives across the campus within the Student Affairs and Enrollment Management, as well as Academic Affairs have supported the University's efforts to attract and retain a proportional mix of students that reflect the community. However, there is room for continued improvement.

The following programs, strategies, and initiatives support enrollment, retention, and graduation, and continue to yield positive results. Selected support programs and interventions include:

- Summer Academic Success Academy (SASA) The Summer Academic Success Academy is an intensive, six-week campus-based, residential program that prepares students for the transition from high school to college. At-risk students have the opportunity to develop confidence and earn college credit prior to the start of the fall semester. SASA students receive information on financial literacy, career planning, personal growth, and other campus resources and support services.
- First Year Experience (FYE) The First-Year Experience program serves as the advisement hub for first-year and sophomore students. Students receive intrusive advisement and guidance through the completion of the first 30 credits of their General Education curriculum.
- Academic Success Centers (ASC) The Centers, housed within each of the four colleges, are staffed by full-time academic advisors and retention coordinators. Staff members monitor student progression, perform registration outreach, and direct students to support services needed for success.
- Our House Community Mentoring Our House provides mentoring for incoming freshmen through a combined peer mentoring and staff mentoring program. Run as a pilot in AY2014, results show a higher freshmen to sophomore retention rate and academic achievement when compared to the University.
- Connecting Ladies across Campus (CLAC) CLAC is designed to build self-esteem in female students with the ultimate goal of empowering them in womanhood, sustaining academic excellence, and building personal and professional relationships that may lead to successful careers. Paired with a mentor from the University's faculty or staff, CLAC supports CSU women of all backgrounds.

- Living Learning Communities (LLCs) The LLC integrates academic learning and residential community living for Honors Scholars and entering first-year and transfer students pursuing a healthcare major. These students have the opportunity to become a part of a learning community within the residence halls. A service-learning component enhances the living learning experience for the students and assists in the development of civic responsibility and awareness.
- Child Development Center Child care services offered through the James E. McDonald Child Development Center support students, employees of the University, and the community with the purpose of providing a safe, nurturing, and educational program that focuses on developmentally appropriate experiences for children. The Center addresses both the need of the campus community as well as provides quality service to the surrounding community. Students who major in Early Childhood Education complete experiential learning at the Center, contributing to their academic preparation.
- The Center for Counseling and Student Development (CCSD) The Center provides quality counseling and mental health services to students experiencing personal, developmental, and psychological issues or distress. They assist students in crisis, intervene in potentially life threating situations, provide quality outreach programs and offer other important additional services. These services address the developmental concerns of students while emphasizing prevention and professional consultative services that increase the understanding of challenges faced by students and promotes psychological well-being.
- **Disability Support Services Disability Support Services (DSSP)** Housed under the Division of Academic Affairs, DSSP has been charged to create an accessible university community to ensure students have equal access to University programs, activities, and services. Policies and procedures are developed to provide students with as much independence as possible and to promote self-advocacy. The services to faculty, staff, and students on disability issues address the needs of individuals to improve the quality and effectiveness of services; advocate for the upgrading and maintenance of the accessibility of all facilities; promote access to technology resources; and provide students with disabilities the same academic opportunities as non-disabled students in all areas of academic life.
- Center for Adult Learners (CAL) The Center was formed with the adult learner in mind, given that the average age of the CSU student is 26 years of age. The goals of the CAL include the following: to increase educational opportunities for firstgeneration college students; to strengthen the level of engagement in the culture of academic rigor; to provide a campus climate in which adult learners demonstrate satisfaction with their program of study and go on to assume careers in their disciplines or continue matriculation into graduate or professional schools; to provide a model to be replicated on a larger-scale for the University; and to inform teaching and learning effectiveness through assessment.

O. Relationship to Low Productivity Programs Identified by the Commission:

1. The program is not related to an identified low productivity program

P. Adequacy of Distance Education Programs (as outlined in COMAR 13B.02.03.22)

- The program will not be offered via distance education.
 Not applicable