

Adopted: October 10, 2016

**ACADEMIC SENATE  
Of  
CALIFORNIA POLYTECHNIC STATE UNIVERSITY  
San Luis Obispo, CA**

**AS-820-16**

**RESOLUTION ON PROPOSED NEW DEGREE PROGRAM FOR MASTER OF  
SCIENCE IN PACKAGING VALUE CHAIN**

- 1 WHEREAS, Strategically considered, packaging incorporates procurement, R&D,  
2 marketing, sales, sustainability, and plays a role in defining margins  
3 and profitability; and  
4
- 5 WHEREAS, There is an emerging emphasis on packaging value chain projected to  
6 substantially impact current and future global supply chains; and  
7
- 8 WHEREAS, The Industrial Technology Area has taught undergraduate  
9 coursework in packaging technology for over twenty-eight years and  
10 is considered amongst the top packaging programs in North America;  
11 and  
12
- 13 WHEREAS, The Industrial Technology Area is proposing a pilot online Master of  
14 Science degree in Packaging Value Chain that exemplifies Cal Poly's  
15 Learn by Doing philosophy and culminates in scholarly research  
16 projects; and  
17
- 18 WHEREAS, The Orfalea College of Business' Graduate Program Committee and the  
19 Academic Senate Curriculum Committee have carefully evaluated this  
20 proposal and recommend its approval; therefore be it  
21
- 22 RESOLVED: That the Academic Senate of Cal Poly approve the proposal for the  
23 Master of Science in Packaging Value Chain and that the proposal be  
24 sent to the CSU Chancellor's Office for final approval.

Proposed by: Jay Singh, Professor and Packaging  
Program Director

Date: August 10, 2016

Title of Proposed Program	Master of Science in Packaging Value Chain (Pilot Degree Program)
College	Orfalea College of Business
Department	Industrial Technology
Contact name(s) and email(s)	Dr. Jay Singh, jasingh@calpoly.edu

1. **Delivery Mode of program:** Fully Face-to-Face ☐ Hybrid ☐ Fully Online ☒

2. **A brief summary of the purpose (i. e., mission and goals) and distinctive characteristics of the proposed degree program.**

The proposed MS in Packaging Value Chain (MS PVC) pilot program is devoted to the *advancement of knowledge and to motivate and co-create holistic, efficient and effective solutions in the realm of packaging and its impact across the global value chains*. The focus of the program is to elaborate on the role of packaging towards creating value addition and includes courses that build on each other towards a holistic understanding of the global packaging diaspora. Towards this goal, the interdisciplinary MS PVC program incorporates packaging science/technology, data analytics, design, marketing, finance, supply chain, operations and statistics. The MS PVC program also intends to offer five certificates that have been carefully designed to accommodate individual needs of professionals looking to advance their knowledge without the need for a graduate degree.

Each course in this fully online program has been developed to engage students in the latest developments in the relevant topics through collaborative online discussions involving case studies, solving real-life problems, and interacting with professionals from the industry. Students will participate in practical exercises related to topics for each of the courses. Online delivery of the courses also offers the professional students flexibility to engage in course content and activities while maintaining a work schedule in their home communities.

Through standardized process and consistency in the delivery of content, student competencies (e.g. engagement in problem solving, creativity, collaboration, research, etc.) will be enhanced in comparison to knowledge and skills typically associated with standard achievement tests or two-hour instructor lectures. Technology tools and lesson plans used in this course will also facilitate students' collaborative learning with peers from varied geographical, personal and professional backgrounds. The courses will follow CSU's Quality Online Learning & Teaching (QOLT) rubrics with students ~~engaged in course content~~, instructors, and their community of inquiry in a well-designed and consistently delivered series of courses. Students will be given accessible and varied content that addresses a variety of learning styles as opposed to a more passive, lecture style of learning. Coursework will match the rigor and expectations of a face to face delivery model as students will use the same software and course materials as a fully on-site student might use. Modules of online learning and course progression in the online environment allow students to work at their own pace with deadlines set well in advance for their personal planning.

3. **The program's fit with the campus mission, strategic plan, and commitment to Learn by Doing.**

**Our Mission:** *Cal Poly fosters teaching, scholarship, and service in a Learn by Doing environment in which students, staff, and faculty are partners in discovery. As a polytechnic university, Cal Poly promotes the application of theory to practice. As a comprehensive institution, Cal Poly provides a balanced education in the arts, sciences, and technology, while encouraging cross-disciplinary and co-curricular experiences. As an academic community, Cal Poly values free inquiry, cultural and intellectual diversity, mutual respect, civic engagement, and social and environmental responsibility.*

Packaging continues to grow beyond merely being a *support function* that puts products in some type of container into a *strategic business function aimed at creating value*. The MS PVC program is an interdisciplinary degree program that encompasses packaging science, design, marketing, finance, supply chain, operations and statistics. *The program is designed to develop competencies in the substantive packaging and related business acumen and to promote transference of learning to the workplace for professionals.* The intent of the program is to provide professionals and full time students with opportunities to assume leadership roles and advance their careers.

See letter of support from the Dean of Orfalea College of Business at the end of this document.

4. **Support Mode:**      State-Support ☐      Self-Support/Extended Education ☒
5. **Anticipated student demand.** Please provide projections in the table below and identify the evidence you have used to make these projections (e.g., US Bureau of Labor Statistics).

Enrollment Projections		Year 1	Year 3	Year 5
<i>Number of Students</i>	MS Degree	15	25	35
	Certificates	34	50	70
<i>Number of Graduates (Cumulative, assuming ~90% graduation rate)</i>	MS Degree	0	32	81
	Certificates	0	67	166

Evidence:

- a. The 1-year *MS in Industrial & Technology Studies* (MS ITS) degree offered by the Industrial Technology Area in OCOB graduated over 30 students each year until 2004. Subsequently until its suspension in 2008, MS ITS was modified to a 2-year degree program and graduated an average of 13 students per year. The MS ITS degree had a substantial packaging emphasis in the curriculum and thesis requirement. A survey to Cal Poly undergraduate students who could have potential interest in the MS PVC degree program was undertaken from May 2-9, 2016. Despite the absence of information sessions and limited response period provided, 113 undergraduate students responded from Industrial Technology, Consumer Packaging Solutions Concentration (OCOBS), Food Science & Nutrition, Graphic Communication and Packaging Minor. Based on a response of “extremely interested” and “interested”, the survey concluded that 24 Cal Poly undergraduate students could potentially enroll in MS PVC degree program in Fall 2017. An additional 48 students indicated “moderate” and “slight” interest in the program.



- b. Through promotions at the other undergraduate Packaging degree programs in the US, we conservatively project an additional 5-7 students enrolling in the 1-year degree program. With approximately 500 students graduating per year with undergraduate packaging degrees in the US<sup>1</sup>, we foresee our unique *packaging value chain* emphasis to a graduate degree being preferable to traditional MBA or related degrees to these professionals.
  - c. A graduate degree as well as relevant certificates in packaging or related field provides professionals with substantial opportunities to assume leadership roles and advance their careers in the packaging industry<sup>2</sup>. Numerous support letters from potential employers supporting the MS PVC degree and certificate offerings have been provided in the full proposal. A sample list of over 70 open career opportunities (until May, 2016) that either 'required' or 'preferred' a graduate degree in packaging or related fields is also provided in the full proposal.
  - d. The Dean of Orfalea College of Business has budgeted \$75,000 for marketing the program by Fall quarter of 2016.
  - e. The consultant report provided in the full proposal offers workforce demand projections for the MS PVC students. Given the primary focus on working professionals, online dissemination of courses, global demand and the right positioning, we foresee robust demand and enrollment at and after the initial launch of the MS in Packaging Value Chain program in Fall 2017.
- 6. Workforce demands and employment opportunities for graduates.** Please describe the demands and opportunities and identify the evidence you have used to draw these conclusions.

Expert reports forecast an annual growth for the global packaging industry of 3.5% per year to 2020, with sales to reach \$997 billion by 2020<sup>3</sup>. In a definitive study of the North American packaging industry, currently valued at \$169.1 billion, experts project its growth to \$186 billion by 2017<sup>4</sup>. Per the consultant report provided in the full proposal, the expectations from potential recruiters of graduates from the MS PVC program includes: *skilled work force (technology, business, communication skills, consumer knowledgeable, global understanding); promotable, versatile, adaptable; strong personal values; strategic/tactical thinkers; critical thinkers; big thinkers and "doers"; resourceful and agile; creative and innovative; program must be collaborative; program must be highly recognized; and looking for highly effective leaders, fast...collaborative, data driven, less hierarchical.*

In response to "where would the MS PVC graduates fit in the industry", the corporations responded: *product manufacturers, brands, packaging manufacturers, 3PLs, transportation companies, military – civilian jobs, military contractors, contract manufacturing, management consulting and design firms.*

In terms of MS PVC graduates' fit in their organizations, the corporations stated:

- *Operating Supply Chain Leader* for specific product or category
- *Think line management* that could have a role in *strategically directing packaging* to differentiate the company
- Likely be *Packaging Department* – savings in handling equip, etc.,

<sup>1</sup> Survey of major North American Packaging Programs conducted by Dr. Jay Singh, January-March 2015

<sup>2</sup> IoPP, 2015 Salary Survey. [http://www.iopp.org/files/2015 Salary Survey Report ENL.pdf](http://www.iopp.org/files/2015%20Salary%20Survey%20Report%20ENL.pdf)

<sup>3</sup> Smithers Pira, The Future of Global Packaging to 2020. Research Report published December 14, 2015

<sup>4</sup> Smithers Pira, The Future of Packaging in North America to 2017. Research Report published November 23, 2012

- *Manufacturing engineering or operations*
- Could reside in *Procurement*. Likely in Package Design or Package Design evaluation
- Retail – comes from *Distribution* – replenishment, planning, etc.
- *Cross functional leadership roles* – look at who will hire (*Project Launch Manager*)
- *Packaging supervisors, plant packaging managers, engineering, maintenance prep engineers, marketing and packaging group, every dept. needs a process engineer...very transferable*

These comments and observations were invaluable in developing the MS PVC program as well as in collating the current rationale on leading corporations' needs related to packaging value chain, particularly when hiring university graduates.

## 7. Other relevant societal needs.

The term *packaging value chain* refers to the network of interconnected businesses and their value creation processes, covering all stages of suppliers - from the point of origin of a packaging solution and all tiers of customers; out to the point of consumption of the product and the ultimate end-of-life options for the packaging. As the power of business customers grows with the increasing technology development, information ubiquity and globalization of markets, delivering customer value is becoming increasingly critical. From packaging being regarded merely as a logistical or materials issue, there has been a shift in the value-creating logic of the packaging industry.

*Packaging continues to grow beyond being a support function that puts products in some type of container to a strategic business function aimed at creating value.* As a business function, packaging spans the entire range of a packaged goods company's activities and brings the holistic agenda to the table. In doing so, it becomes the strategic enabler that helps other functions deliver benefits to the consumer. Strategically considered, packaging incorporates procurement, R&D, marketing, sales, sustainability and plays a role in defining margins and profitability. Some future trends and drivers for development of packaging supply chain models are: global-growth-of-the-middle-class; network-optimization; packaging technologies – materials and design; modeling and simulation, product, package and supply chain; sustainability; and transparency and risk mitigation. The implication of these trends and drivers is big shifts in the production system that will demand 'more and different' from packaging across the value chain.

8. **Provide an assessment of the required resources and the campus commitment to allocating those resources.** Provide a narrative description and an itemized list in the table below of the resources that currently exist to support the new program, as well as the additional resources that would be needed to added at initiation, after 3 years, and after 5 years.



**2016 Academic Plan – New Degree Summary Statement  
(2015-16 AY)**

	Existing resources	At initiation- new resources	New resources to be added after 3 years	New resources to be added after 5 years
Faculty	9	1	0	1-2
Student allocations	0	0	0	0
Support staff	1	0	1	0
Facilities	None	None	None	None
Equipment	None	None	None	None
Information resources	Student/faculty access to PolyLearn and Zoom, electronic library and learning resources	None	None	None

**Narrative:**

**Faculty:** All faculty currently participating in the MS PVC program are full time faculty with expertise in the courses led by them. OCOB has approved a new tenure-track position in the primary area of Packaging Science and Technology with a start date of September 7, 2017. This faculty member will be immediately engaged in the MS PVC program. We expect the same course offering, listed in section 10, for the first 3 years of program implementation. As the program grows, we will take market needs into account to create new electives. This may necessitate recruitment of additional 1-2 faculty after 5 years. The self-support program is expected to generate sufficient revenue to fund these positions.

**Student allocations:** Student assistants are not required for this fully online program

**Support staff:** An additional staff member may be required with administration responsibilities related to the program after 3 years. The self-support program is expected to generate sufficient revenue to fund these position.

**Facilities & Equipment:** The MS PVC program will be offered fully online and no Cal Poly lecture and/or laboratory equipment/space will be required

**Information resources:** At launch we anticipate the software requirements to primarily be related to student/faculty access to PolyLearn (Moodle LMS) and Zoom (video-conferencing). Access to and support for both of these are provided by Cal Poly's Information Technology Services. With regards to the instructional support (electronic library and learning resources), support is available through Kennedy Library. As the software/support needs of the program evolve, the OCOB has a team of support staff who can provide support when campus-wide resources are unable to.

**Note:** The Dean's and Provost's signatures below represent the campus commitment to allocating these resources.

**9. And, as applicable:**

- a. If the projection is a pilot program, please list the academic years during which the program will operate in pilot status.**

2017-18 to 2021-22 (5 years)

- b. For new degree programs that are not already offered in the CSU, please provide a compelling rationale explaining how the proposed subject areas constitutes a coherent, integrated degree program that has potential value to students and meets CSU requirements for an academic program at the undergraduate or graduate level.**

In academia Packaging, as an interdisciplinary field, involves business, design, technology, science, engineering, and the environmental disciplines. Packaging science and technology has become, more than ever, a key to business success because of dramatic economic and technological changes across a range of industrial sectors, particularly the globalization and outsourcing of some portion of nearly all value-added products. Additionally, the public policy environment, both domestic and international, is placing new demands on the packaging industry to improve its environmental footprint, reduce energy consumption, enhance recycling and contribute positively to global sustainability.

There are less than a dozen 4-year degree programs in or related to Packaging in North America. Cal Poly's Packaging Program has developed a national reputation as a significant source of packaging research and education. An increasing number of companies support packaging specific recruitment as well as research & development projects at Cal Poly, resulting in a growing portfolio of returning/new employers as well as larger research projects funded by government and other third-party organizations. The Cal Poly Packaging Program, by most assessments, is considered among the top university-based programs in the United States in Packaging Science and Technology. Located at the Orfalea College of Business, the program is offered as a Major (Industrial Technology), a Concentration (Consumer Packaging Solutions) and a Minor.

The CSU system currently offers no graduate degree programs specifically devoted to the packaging value chain. San Jose State University offers a BS degree in Nutritional Science with a Concentration in Packaging but no standalone packaging specific graduate degree. There are no graduate programs at Cal Poly that offer any curricula related to the proposed MS Packaging Value Chain program.

**10. Provide the Learning Objectives for the Program and the curricular requirements.**

The proposed MS PVC program aims as serving as an exemplar for Cal Poly's learn-by-doing philosophy through graduating students that will be able to:

- a. Specify holistic, efficient and effective solutions in the realm of packaging and its impact across the global value chains
- b. Develop analytical and critical thinking skills towards assessing the value addition proposition of packaging
- c. Analyze and explain local, national, and global ethical issues related to the packaging value chains
- d. Infer the present and anticipated future packaging needs of the global society

- e. Effectively compose written and oral texts for a variety of scholarly, professional, and creative purposes

The table below identifies the core and approved elective course requirement towards the MS PVC degree.



<b>Core Courses</b>		
Course Number	Course Title	Units
GSP 530	Packaging Value Chain	2
GSP 532	Packaging Materials	4
GSP 533	Advanced Packaging Laws & Regulations	3
GSP 535	Packaging Value in Logistics and Supply Chain Management	3
GSP 536	Packaging Design	4
GSP 539	Marketing & Sales for Packaged Product	4
GSP 540	Quantitative Analysis for Packaging	4
GSP 591	Applied Industry Project	5
<b>Core Subtotal</b>		<b>29</b>
<b>Approved Electives</b>		
<i>Select any four</i>		
Course Number	Course Title	Units
GSB 520	Data Management for Business Analytics	4
GSP 541	Corporate Finance for Packaging	4
GSB 534	Lean Operations Management	4
GSB 563	International Business Tour	4
GSP 537	Distribution Packaging for Business Managers	4
GSP 538	Quality Evaluation of Packaged Products	4
<b>Electives Subtotal</b>		<b>16</b>
<b>TOTAL UNITS</b>		<b>45</b>

Specific to the requirements of Section 40510 of Title 5 of the California Code of Regulations, MS PVC students are required to take 5 units of GSP 591 (Applied Industry Project). The purpose of this core course is to engage in an interdisciplinary research activity, allowing for an opportunity to apply knowledge, skills, and competencies to address a significant issue in the field of packaging value chain, preferably in connection with the student's employment.



**11. Signatures**

We confirm that the proposed new program fits with the mission and the strategic plan for the college. Additionally, there is a commitment to allocating the resources required by the proposed new program, both in the initiation phase and the future development of the program.

Department Chair/Head	Date
Dr. Eric Olsen 	8/15/16
Dean	Date
Dr. Sanjiv Jaggia 	8/15/16

We confirm that the proposed new program fits with the mission and the strategic plan for the campus.

Academic Program Consultative Committee	Date
Provost	Date

**CAL POLY**  
OFFICE OF THE DEAN  
ORFALEA COLLEGE OF BUSINESS

February 8, 2016

To Whom It May Concern,

The new MS Packaging Value Chain program will contribute to the mission of the Orfalea College of Business to produce career ready graduates. Packaging is a strong differential advantage for the College, and is one of two areas that we have identified for global distinction. Delivering the MS Packaging Value Chain program online allows us to reach working professionals across the United States, and potentially the world, thereby building the reputation and reach of the Orfalea College of Business.

In order to ensure the success of MS Packaging Value Chain program, we hired a consultant to collect input about the skills employers desire from graduates, to identify other programs in the market, and to verify the differential advantage we have because of our existing faculty, our packaging labs, our learn by doing ethos, and the polytechnic nature of the University. The new MS builds on a strong undergraduate program and the guidance of an advisory board of leaders from firms such as Pepsi, Walmart, Amgen, and Nestle. This board provided input on the MS curriculum, and will contribute to the program's success by recruiting students from their firms to enroll in the program and hiring graduates. The Deans Advisory Council from OCOB, which includes senior executives from firms such as Apple, Google, Cisco, and NetApp, enthusiastically endorsed the MS Packaging Value Chain program during its May 2015 meeting. In short, we have verified the need for the MS in Packaging Value Chain, and designed the program to meet well defined needs by methodically engaging with industry.

OCOB faculty are uniquely equipped to deliver the MS in Packaging Value Chain, which will be offered as a self-support program and will not interfere with the delivery or success of any other existing program in the College, or in any other academic unit at Cal Poly. In fact, experience from delivering this program online will provide an example to other faculty in the College that teaching online can yield important benefits. We will be adding to our cadre of packaging faculty by hiring additional faculty to deliver the program.

We will designate a Director of the MS Packaging Value Chain program to ensure that someone has clear responsibility for recruiting, admitting, advising, and placing graduates. The Orfalea endowment is helping to underwrite the costs of launching this program and ensuring its success.

The current facilities for OCOB have the capacity to house the administration and delivery of the MS in Packaging Value Chain. No new facilities are required.

I am very excited and confident about the future of the new MS in Packaging Value Chain. Please let me know if you have any questions or concerns.

A handwritten signature in dark ink, appearing to read "Scott Dawson", with a stylized flourish at the end.

Scott Dawson  
Dean



# MEMORANDUM

Cal Poly | Office of the President



**To:** Gary Laver  
Chair, Academic Senate

**Date:** October 18, 2016

**From:** Jeffrey D. Armstrong  
President

A handwritten signature in blue ink, which appears to read "Jeff Armstrong", is written over the printed name of the President.

**Copies:** K. Enz Finken  
M. Pedersen  
S. Dawson  
K. Lertwachara  
B. Tietje  
C. Sunata

**Subject:** Response to Academic Senate Resolution AS-820-16  
Resolution on Proposed New Degree Program for Master of Science in  
Packaging Value Chain

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I am pleased to approve the above-entitled Academic Senate resolution. The proposal will now be sent to the Chancellor's Office for approval.

Please express my appreciation to the Academic Senate members for their attention to this important curricular matter.

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**TO:** Jeffrey Armstrong

President

**FROM:** Gladys Gregory 

Academic Senate Coordinator

**SUBJECT:** Resolution passed by the Academic Senate on October 11, 2016

**DATE:** October 12, 2016

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Enclosed for your review and approval is the resolution passed by the Academic Senate at its meeting of October 11, 2016:

**AS-820-16      Resolution on Proposed New Degree Program for Master of Science in  
Packaging Value Chain**

Enclosures