Systems Engineering Distance Learning Education Summit
19 November 2020
by
Dr. Wally Owen
Associate Chair for Distributed Programs & Outreach
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Monterey, California

NAVAL POSTGRADUATE SCHOOL

- Stackable Certificates
- Spring 2021 Program Offerings
- Systems Engineering Innovation and Technical Seminar Series

▼ Education

- Ph.D., M.S., Virginia Tech (2002/1997) Industrial & Systems Engineering
- B.S., SUNY Maritime College (1986) Meteorology & Oceanography
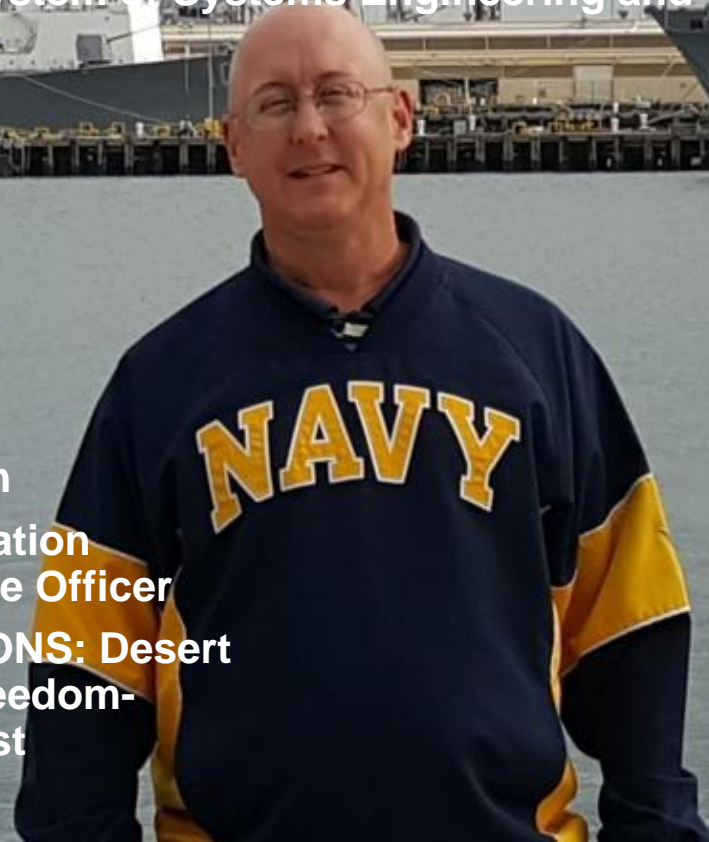- JPME Certificate, Naval War College (2009)

▼ NPS Experience

- Professor of Practice since 2012
- Reseach and teaching forcus on System of Systems Engineering and Model-Based System Engineering

▼ U.S. Government Civilian Experience

- Director, International R&D
- Chief Architect
- Lead Systems Engineer
- Modeling & Simulation Lead

▼ Military Experience

- Retired U.S. Navy Reserve Captain
- Qualified Surface Warfare, Information Dominance Warfare & Space Cadre Officer
- MAJOR CAMPAIGNS & OPERATIONS: Desert Shield/Desert Storm, Enduring Freedom-Afghanistan, Operation Burnt Frost

Education

BS Naval Engineering (Management & Technology), USNA 1979
MS Management (Financial Management), NPS 1992
DPA Public Administration, Golden Gate University, 2003

NPS Experience

Faculty member since 1992

GSDM, Meyer Institute, GSEAS Department of Systems Engineering

Teaching and Academic Service Experience

NPS- Acquisition, Financial, Performance and Program Management, Public Policy, Leadership
USNA- LEAD program for Company Officers
DAU- ACQ201, SYS201 and SYS301 (DAU early days road warrior)
AA- 312 program and PO- 282, 242 and 721 programs

Associate Chair for DPO

Serve as PM for all DL programs oversee all DL functions
Manage the business of distance learning
Work closely with all NPS stakeholders and external sponsors

Active Duty Experience

Retired F4/F14 Naval Flight Officer
WESTPAC Cruise, CV64 USS Constellation (F14)
Around-the-World Cruise, CV43 USS Coral Sea (F4)
Officer Programs Officer, NRD St. Louis
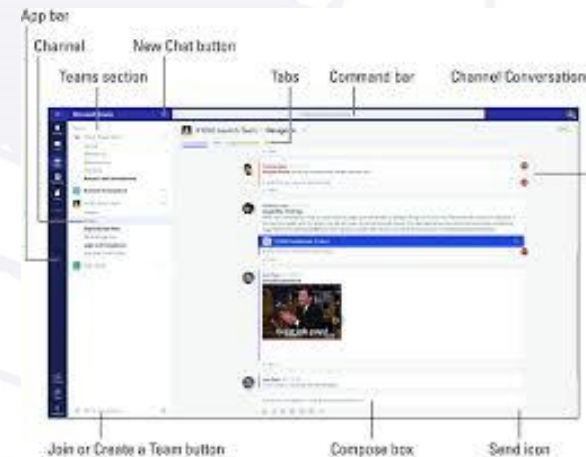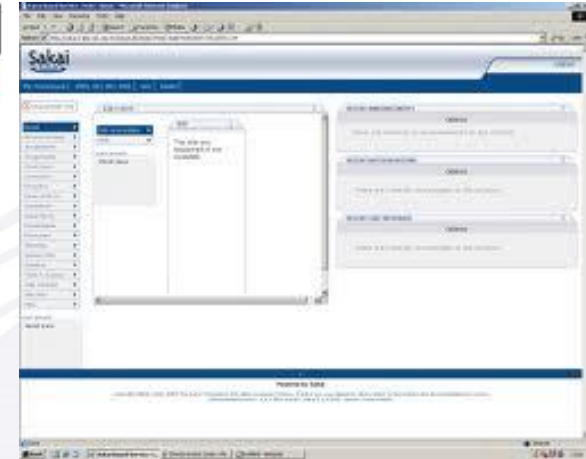Air Operations Officer, CVN65 USS Enterprise

SYSTEMS ENGINEERING
The Journal of The International Council on Systems Engineering

INCOSE

- For organizations with a strategic vision to provide world-class systems engineering, systems integration and systems engineering management services

- Recognized as a leader in field of distance learning (DL)

- Each DL course offer as one continuous (3) hour web-conferencing session one day per week (times/days vary)

- All web-conferencing sessions are recorded

- Typical certificate program offered as one course per quarter (4 total) consecutively over four quarters

- Typical degree program offered as two courses per quarter (16 total) over eight consecutive quarters or as four stackable certificates

- All SE and SEM programs accredited by WASC and MSSE degree also accredited by ABET

- Collaborative Learning Environment
  - Sakai web-based courseware
- Multiple Teaching Types for DL Education
  - Synchronous/Asynchronous Web Browser Based
    - *Zoom for Gov and/or MS Teams* used for teaching synchronously
      - Video, Voice, Chat, Desktop Sharing
    - *Sakai* used for teaching asynchronously
- SE Computer Lab Available Worldwide
- NPS Library Resources Available Worldwide
  - Books, Journals, Databases all on-line
- On-Site Face-to-Face Classrooms
  - Classroom facilities located in Washington, DC (Pax River, MD) and San Diego, CA

- The SE Department has partitioned its DL program offerings into stackable certificates

- Stackable certificates enhances the value proposition:
  - Sponsors can fund only those academic certificates for which they have an immediate need
  - Students will be able to earn a MS degree by stacking together academic certificates

- Supports Navy advanced education strategic plan and the new Engineering & Technical Management (ETM) functional area competency framework
  - Offers a customization approach to provide systems engineering and systems engineering management advanced education options for workforce development
  - Provides a graduate degree path for students that have earned certificates from other departments or schools

- SE offers DL graduate certificates and degree programs that are tailorable to sponsors and their students
- Stackable certificates can meet master's degree curricula requirements leading to MSSE, MSES or MSSEM degrees
- Certificates are identified by tiers and are typically taken in sequence but not necessarily as it varies by certificate
- Each tier certificate can be tailored dependent on the ultimate curricula (311 or 711) and degree desired

Tier I SE Fund Cert pick one	Tier II SE/SEM Core Cert pick one	Tier III SE/SEM Domain Cert pick one	Tier IV SE/SEM Cap Cert pick one
4 Courses	4 Courses	4 Courses	4 Courses

Qtr	Yr/Qtr	Course Title	Course Title
1		Fundamentals of Systems Engineering	Probability and Statistics for SE
2		Fundamentals of Engineering Project Management	Capability Engineering
3		System Suitability	Engineering Economics and Cost Estimation
4		SE CERT Focus Course and/or 311 Elective	Systems Architecting and Design
5		SE Domain Specialty Track	Systems Integration and Development
6		SE Domain Specialty Track	SE Capstone Project- I
7		SE Domain Specialty Track	SE Capstone Project- II
8		SE Domain Specialty Track	SE Capstone Project- III

Tier I SE Certificate	Tier II SE Core Certificate	Tier III SE Domain Certificate	Tier IV SE Capstone

Qtr	Yr/Qtr	Course Title	Course Title
1		Fundamentals of Systems Engineering	Intro to Digital Engineering with Model-Based Systems Engineering
2		Fundamentals of Engineering Project Management	Probability and Statistics for HSI
3		System Suitability	Engineering Economics and Cost Estimation
4		SE CERT Focus Course and/or 711 Elective	Human Factors in Systems Design
5		SEM Domain Specialty Track	Risk Analysis & Management of Engineering Systems
6		SEM Domain Specialty Track	Modeling & Simulation in Acquisition
7		SEM Domain Specialty Track	SEM Capstone Project- I
8		SEM Domain Specialty Track	SEM Capstone Project- II

Tier I SE Certificate	Tier II SEM Core Certificate	Tier III SEM Domain Certificate	Tier IV SEM Capstone

- 282 Systems Engineering (Fundamentals)
- 232 Lead Systems Integration (Domain Specialty)
- 242 Reliability & Maintainability Engineering (Domain Specialty)
- 130 SE Capstone (SE Advanced)
- 131 Systems Capability & Design (SE Core)
- 132 System of Systems Engineering (Domain Specialty)
- 133 Model-based Systems Engineering (Domain Specialty)
- 134 Aviation Systems (Domain Specialty)
- 135 Systems Test & Evaluation (Domain Specialty)
- 136 Directed Energy Systems (Domain Specialty)
- 137 System Safety Engineering (Domain Specialty)
- 138 Digital Engineering (Domain Specialty)
- 170 SEM Capstone (SEM Advanced)
- 171 Systems Integrated Development (SEM Core)
- 172 Systems Technology & Advancement (Domain Specialty)

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SE Fundamentals	SE/SEM Core Certs	SE/SEM Domain Certs	Other Domain Certs
282 Certificate	103-SCD/107-SID	232/242/130s/170s	Data Science/Others
DL	DL	DL	DL
4 quarters	4 quarters	4 quarters	4 quarters
3 + 1 focus course	4 courses	4 courses	4 courses
Project-based	Project-based	Project-based	Project-based
Stackable	Stackable	Stackable	Stackable
25-30 per cohort	25-30 per cohort	25-30 per cohort	25-30 per cohort
Tier I Fundamentals	Tier II Core	Tier III Domain	Tier III- Other Depts

Stackable Certificates
Tier I-   SE Fundamentals
Tier II- SE/SEM Core
Tier III- Domain Specialty
Tier IV- Advanced Capstone

All curricula leading to a master's degree are designed for stackable certificate completion or can be taken as a full up DL degree program

SE/SEM Capstone	SEM Masters	SE Masters	PhD in SE
130-SEC/170-SEMC	711/721/722	311/312	582
DL	DL	DL	Resident/DL
4 quarters	8 quarters	8 quarters	12 quarters
4 courses	16 courses	16 courses	6 courses min
Capstone Project	Thesis/Project	Capstone Project	Dissertation
Stackable	Stackable Certs	Stackable Certs	Tailored to each
25-30 per cohort	25-30 per cohort	25-30 per cohort	3 per quarter
Tier IV Advanced	~200 students	~200 students	~15 students

Blackboard collaborate

Sakai

Systems Engineering Non-Resident Master's Degree, Mission Engineering Focus
Commencing Wednesday, 31 March 2021
Program Delivered via Distance Learning
Sponsor Code: Open Enrollment (311-213O)

	Course Lineup*		
Qtr	**Year/Qtr**	**Course Title**	
1	AY21/Spring	Fundamentals of Systems Engineering	Probability and Statistics for SE
2	AY21/Summer	Fundamentals of Engineering Project Management	Capability Engineering
3	AY22/Fall	System Suitability	Engineering Economics and Cost Estimation
4	AY22/Winter	Management of Advanced Systems Engineering	Systems Architecting and Design
5	AY22/Spring	SoS Program Definition and Concept Development	System Integration and Development
6	AY22/Summer	SoS Design and Development	Engineering Systems Conceptualization
7	AY23/Fall	SoS Integration, Qualification and Lifecycle	Engineering Systems Design
8	AY23/Winter	Leadership in System Integration	Eng Systems Implementation and Operation

SE Certificate Course	SE Core Course	SE Domain Focus	SE Capstone Project

Application Deadline: 8 January 2021

Systems Engineering Certificate with Advanced SE Focus
Commencing on Thursday, 1 April 2021
Program Delivered via Distance Learning
Sponsor Code: Open Enrollment (282-213O)

Course Lineup		
Qtr	**Year/Quarter**	**Course Title**
1	AY21/Spring	SE3100 Fundamentals of Systems Engineering (3-2)
2	AY21/Summer	SI3400 Fundamentals of Engineering Project Management (3-2)
3	AY22/Fall	SE3302 Systems Suitability (3-2)
4	AY22/Winter	SE4012 Management of Advanced Systems Engineering (3-0)

Application Deadline: 8 January 2021

New

Systems Capability & Design Certificate
Commencing on Wednesday, 31 March 2021
Program Delivered via Distance Learning
Sponsor Code: Open Enrollment (131-213O)

Qtr	Year/Quarter	Course Title
|	| Course Lineup	
1	AY21/Spring	OS3180 Probability and Statistics for Systems Engineering (4-1)
2	AY21/Summer	SE3250 Capability Engineering (3-2)
3	AY22/Fall	SE3011 Engineering Economics and Cost Estimation (3-0)
4	AY22/Winter	SE4150 System Architecture and Design (3-2)

Application Deadline: 8 January 2021

New

**Certificate in Systems Safety Engineering
Commencing on Wednesday, 31 March 2021**
Program Delivered via Distance Learning
Sponsor Code: Open Enrollment (137-213O)

Course Lineup		
Quarter	**Year/Quarter**	**Course Title**
1	AY21/Spring	SE3900 Topics in Systems Engineering Analysis (3-2)
2	AY21/Summer	SE4353 Risk Analysis and Management for Engineering Systems (3-2)
3	AY22/Fall	SE3321 Reliability Management and Data Systems (3-2)
4	AY22/Winter	SE4003 Systems Software Engineering (3-2)
5	AY22/Spring	SE4101 Systems Safety Engineering (3-2)

Application Deadline: 8 January 2021

Certificate in Reliability & Maintainability Engineering
Commencing Wednesday 31 March 2021
Program Delivered via Distance Learning
Sponsor Code: OPEN Enrollment (242-213O)

	Course Lineup	
Quarter	**Year/Quarter**	**Course Title**
1	AY21/Spring	SE3900 Topics in Systems Engineering Analysis (3-2)
2	AY21/Summer	SE3302 System Suitability (3-2)
3	AY22/Fall	SE3321 Reliability Management and Data Systems (3-2)
4	AY22/Winter	OA4302 Reliability and Weapon System Effectiveness Measurement (4-0)
5	AY22/Spring	SE4321 Reliability Growth and Accelerated Testing (4-1)

Application Deadline: 8 January 2021

312 Degree Curriculum – Spring 2021

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Aviation Systems Engineering Non-Resident Master's Degree
Commencing Tuesday, 30 March 2021
Program Delivered via Distance Learning
Sponsor Code: USNTPS Grads (312-213)

Course Lineup		
Qtr	**Year/Quarter**	**Course Title**
1	AY21/Spring	SI3100- Fundamentals of Systems Engineering (3-2)
2	AY21/Summer	SE3011- Engineering Economics & Cost Estimation (3-0)
3	AY22/Fall	SE3302- System Suitability (3-2)
4	AY22/Winter	SI-3400- Fundamentals of Engineering Project Management (3-2)
5	AY22/Spring	SE3250- Capability Engineering (3-2)
6	AY22/Summer	SE4150- Systems Architecting and Design (3-2)
7	AY23/Fall	SE4151- Systems Integration and Development (3-2)
8	AY23/Winter	SE4353- Risk Analysis and Management of Engineering Systems (3-2)

Application Deadline: 8 January 2021

Open enrollment rate: AY21 open enrollment tuition rate is $2500 per student per course w/o books. If NPS is expected to provide books then add $200 fixed fee per course for the duration of program. Tuition rate applies to all SE certificate, master's degree and PhD programs. Tuition is required for any student enrolled in a course as of the first day of class.

Full sponsorship tiered fixed-price rate: Two tiered fixed-price options are offered to sponsors who make significant enrollment commitments. These options are offered as a result of reduced direct and variable costs associated with the commitments.

Cohort Pricing: The rate is $2000 per course w/o books. Organization commits to sponsor and fund an entire cohort of a minimum of 25 seats (not to exceed 30 per cohort) in a DL program and agrees to assume student attrition below the fixed-price floor of $50K. It is recommended that commands start with more than 25 students to minimize impacts of student attrition. If student enrollment drops to 24 or below, the price remains fixed at $50K per course for the cohort for duration of the program.

Partner Pricing: The rate is $2000 per course w/o books. Organization commits to sponsor and fund 50 or more seats across all DL programs. It is recommended that commands closely monitor the overall quarterly enrollment numbers to keep them at or above 50 seats. Should the student enrollment drop to 49 or below in any particular quarter, tuition will be fixed at the 50 seat rate. The command can then opt to revert back to open enrollment pricing or sponsor additional DL students in upcoming programs.

Short Courses: Various 1-3 day SE subject short courses are available not for graduate credit. The fixed price with book or handouts for 1-day is $15K, 2-day is $25K and 3-day is $30K for up to 25 seats. **Special arrangements:** NPS prides itself on being responsive to the needs of the Department of Defense. Any organization requesting additional program features or other special arrangements should contact the Associate Chair DPO to negotiate pricing.

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SE iTech Outreach Seminar

Systems Engineering Innovation & Technology in Research, Education & Practice

Expose and Control Your System's Emergent Behaviors with Monterey Phoenix

Dr. Kristin Giammarco

Associate Professor

Date: Thursday, 21 January 2021
Time: 1400-1500 Eastern Time/1100-1200 Pacific Time
Location: Zoom for Government

- ✓ New Stackable Certificates offers flexibility and incremental learning.
- ✓ Spring 2021 program offerings – Applications due 8 Jan
  - ✓ 311 - Systems Engineering Non-Resident Master's Degree, Mission Engineering Focus
  - ✓ 312 - Aviation Systems Engineering Non-Resident Master's Degree
  - ✓ 131 – System Capability and Design Certificate
  - ✓ 137 – Certificate Systems Safety Engineering
  - ✓ 242 - Certificate in Reliability & Maintainability Engineering
  - ✓ 282 - Systems Engineering Certificate with Advanced SE Focus
- ✓ Open tuition price $2500 per course but tiered pricing to $2000 per course for sponsors doing more business
- ✓ SE iTECH -
- ✓ Visit SE DL website at https://nps.edu/web/seet/distant

- Chair, SE Department: Ron Giachetti– regiache@nps.edu
  - 831-656-2670
- Associate Chair DPO: Wally Owen - wowen@nps.edu
  - Distance Learning, Director of Programs and Business
  - 831-402-6086
- Dep Assoc Chair MOE: Warren Vaneman - wvaneman@nps.edu
  - Distance Learning, Program Manager
  - 571-364-5126
- Education Technician: Heather Hahn - hlhahn@nps.edu
  - Academic administrative support for students and sponsors
  - 585-309-4163
- GEAC Student Support: - GEACStudCoord@nps.edu
  - Program support for students
  - 831-656-3579

What to Expect from Us: Availability, Help, Advice, Action

NAVAL POSTGRADUATE SCHOOL

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