Systems Engineering Distance Learning Education Summit
30 November 2021
by
Dr. Wally Owen
Associate Chair for Distributed Programs & Outreach
Dr. Warren Vaneman
Dep Associate Chair for Marketing, Outreach & Engagement

Monterey, California
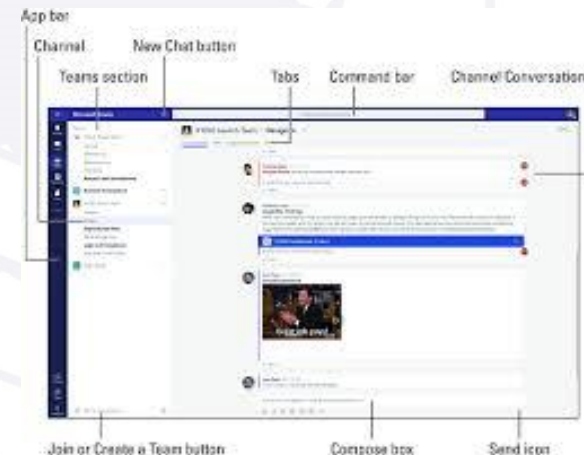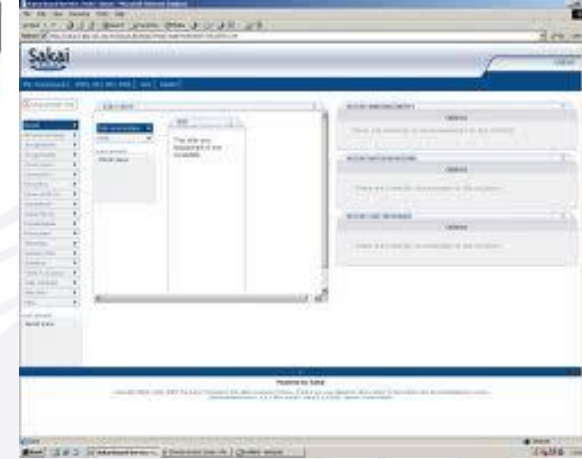WWW.NPS.EDU

- Spring 2022 Program Offerings.

- Looking ahead to the Summer 2022.

- 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 may vay by certificate
- Each tier certificate can be tailored dependent on the ultimate curricula (311 or 711) and degree desired

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

- 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)
- 173 Systems Program Management (Domain Focus- in Cert Review)

Tier 1 SE / SEM Fundamentals Certificate

- 282 Systems Engineering

Tier 2 SE/SEM Core Certificates

(Choose one)

- 131 Systems Capability & Design
- 171 Systems Integrated Development

Tier 3 SE/SEM Domain Specialty Certificates

(Choose one)

- 132 System of Systems Engineering
- 133 Model-based Systems Engineering
- 134 Aviation Systems
- 135 Systems Test & Evaluation
- 136 Directed Energy Systems
- 137 System Safety Engineering
- 138 Digital Engineering
- 172 Systems Technology & Advancement
- 173 Systems Program Management
- 232 Lead Systems Integration
- 242 Reliability & Maintainability Engineering
- Certificates from other departments such as Data Science, Robotics, Defense Energy, and others in development
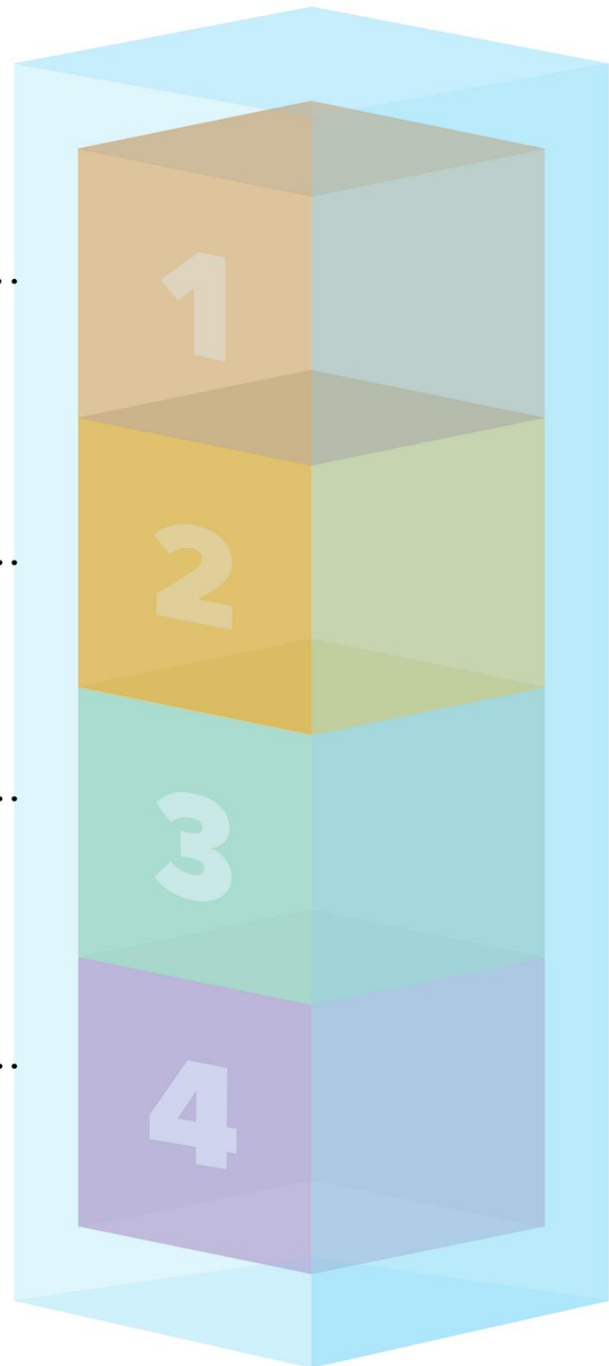
Tier 4 SE / SEM Advanced Capstone Certificates

(Choose one)

- 130 Systems Engineering Capstone
- 170 Systems Engineering Management Capstone

Master's Degree Options

- MS in Systems Engineering
- MS in Engineering Systems
- MS in Systems Engineering Management

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 Elective Course	Systems Architecting and Design
5		SE Domain Specialty Track	System 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

282 Systems Engineering Certificate

131 System Capability And Design Certificate

Various Domain Speciality

130 Systems Engineering Capstone

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 System Engineering
2		Fundamentals of Engineering Project Management	Probability and Statistics for HSI
3		System Suitability	Engineering Economics and Cost Estimating
4		SE CERT Focus Course and/or 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

282 Systems Engineering Certificate

171 System Capability And Design Certificate

Various Domain Speciality

170 SE Management Capstone

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

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Systems Engineering with Model-Based Systems Engineering or Systems Technology and Advancement Focus Commencing Tuesday, 29 March 2022

Program Delivered via Distance Learning

Sponsor Code: Open Enrollment (311-223O)

Qtr	Year/Qtr	Course Title	
		Course Lineup*	
1	AY22/Spring	SE3100 Fundamentals of Systems Engineering	OS3180 Probability & Statistics for SE
2	AY22/Summer	SI3400 Engineering Project Management	SE3250 Capability Engineering
3	AY23/Fall	SE3302 Systems Suitability	SE3011 Eng Economics & Cost Estimation
4	AY23/Winter	SE4012 Management of Advanced SE	SE4150 Systems Architecting & Design
5	AY23/Spring	133-MBSE, 172-STA	SE4151 System Integration & Development
6	AY23/Summer	133-MBSE, 172-STA	SE3201 Engineering Systems Conceptualization
7	AY24/Fall	133-MBSE, 172-STA	SE3202 Engineering Systems Design
8	AY24/Winter	133-MBSE, 172-STA	SE3203 Eng Systems Implementation & Operation

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

Application Deadline: 3 January 2022

Aviation Systems Engineering Non-Resident Master's Degree
Commencing Tuesday, 29 March 2022
Program Delivered via Distance Learning
Sponsor Code: USNTPS Grads Only (312-223)

Qtr	Year/Quarter	Course Title
Course Lineup		
1	AY22/Spring	SI3100 Fundamentals of Systems Engineering
2	AY22/Summer	SE3011 Engineering Economics & Cost Estimation
3	AY23/Fall	SE3302 System Suitability
4	AY23/Winter	SI3400 Fundamentals of Engineering Project Management
5	AY23/Spring	SE3250 Capability Engineering
6	AY23/Summer	SE4150 Systems Architecting and Design
7	AY24/Fall	SE4151 Systems Integration and Development
8	AY24/Winter	SE4353 Risk Analysis and Management of Engineering Systems

Application Deadline: 3 January 2022

**Systems Engineering Management with
Systems Technology and Advancement Focus
Commencing Wednesday, 30 March 2022**

Program Delivered via Distance Learning

Sponsor Code: Open Enrollment (711-223P)

Course Lineup		
Qtr	**Year/Qtr**	**Course Title**
1	AY22/Spring	SE3100 Fundamentals of Systems Engineering / SE3050 Intro to Digital Engineering & MBSE
2	AY22/Summer	SI3400 Fundamentals of Eng Project Mgmt / OS3111 P&S for Human Systems Integration
3	AY23/Fall	SE3302 Systems Suitability / SE3011 Engineering Economics & Cost Estimation
4	AY23/Winter	SE4012 Management of Advanced SE / OS3401 Human Factors in Systems Design
5	AY23/Spring	SE3910 System Evolution & Tech Assessment / SE4353 Risk Analysis & Mgmt of Eng Systems
6	AY23/Summer	SE4420 M&S in Acquisition / SEM Focused Course
7	AY24/Fall	SE4980 Enterprise Systems / SE3211 SEM Capstone I
8	AY24/Winter	SE4503 Technology Planning and Replacement / SE3212 SEM Capstone II

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

Application Deadline: 3 January 2022

NAVAL POSTGRADUATE SCHOOL

Tier I

Systems Engineering Certificate with Advanced Systems Engineering Focus Commencing on Tuesday, 30 March 2022
Program Delivered via Distance Learning
Sponsor Code: Open Enrollment (282-223O/P)

Qtr	Year/Quarter	Course Title
**Course Lineup**		
1	AY22/Spring	SE3100 Fundamentals of Systems Engineering (3-2)
2	AY22/Summer	SI3400 Fundamentals of Engineering Project Management (3-2)
3	AY23/Fall	SE3302 Systems Suitability (3-2)
4	AY23/Winter	SE4012 Management of Advanced Systems Engineering (3-0)

Application Deadline: 3 January 2022

Tier II

Systems Capability and Design Certificate
Commencing Thursday, 31 March 2022
Program Delivered via Distance Learning
Sponsor Code: OPEN Enrollment (131-23O)

Course Lineup		
Qtr	**Year/Quarter**	**Course Title**
1	AY22/Spring	OS3180 Probability and Statistics for Systems Engineering (4-1)
2	AY22/Summer	SE3250 Capability Engineering (3-2)
3	AY23/Fall	SE3011 Engineering Economics and Cost Estimation (3-0)
4	AY23/Winter	SE4150 System Architecture and Design (3-2)

Application Deadline: 3 January 2022

Tier II

Systems Integrated Development Certificate
Commencing Friday, 1 April 2022
Program Delivered via Distance Learning
Sponsor Code: OPEN Enrollment (171-223P)

Course Lineup		
Qtr	**Year/Quarter**	**Course Title**
1	AY22/Spring	SE3050 Introduction to Digital Engineering with Model-Based Systems Engineering (3-2)
2	AY22/Summer	OS3111 Probability and Statistics for Human Systems Integration (4-0)
3	AY23/Fall	SE3011 Engineering Economics and Cost Estimation (3-0)
4	AY23/Winter	OS3401 Human Factors in Systems Design (3-1)

Application Deadline: 3 January 2022

Tier III

Lead Systems Integrator (LSI) Certificate Program
Commencing Tuesday, 29 March 2022
Program Delivered via Distance Learning
Sponsor Code: OPEN Enrollment (232-223O)

		Course Lineup
Qtr	**Year/Quarter**	**Course Title**
1	AY22/Spring	SE3411 - SoS Program Definition & Concept Development (3-2)
2	AY22/Summer	SE3412 - SoS Design & Development (3-2)
3	AY23/Fall	SE3413 - SoS Integration, Qualification & Lifecycle (3-2)
4	AY23/Winter	SE4414 - SoS Leadership in Systems Integration (3-2)

Application Deadline: 3 January 2021

Tier III

Certificate in Systems Test & Evaluation
Commencing Tuesday, 29 March 2022
Program Delivered via Distance Learning
Sponsor Code: OPEN Enrollment (135-223O)

		Course Lineup
Quarter	**Year/Quarter**	**Course Title**
1	AY22/Spring	SE3900 Topics in Systems Engineering Analysis (3-0) *
2	AY22/Summer	OS3401 Human Factors in System Design (3-1)
3	AY23/Fall	SE4003 Systems Software Engineering (3-2)
4	AY23/Winter	SE4353 Risk Analysis and Management for Engineering Systems (3-2)
5	AY23/Spring	SE4354 Systems Verification and Validation (4-0)

Prerequisite: Tier I- SE certificate (282) or equivalent
* Note: SE3900 is not required if prerequisite is met

Application Deadline: 3 January 2022

Tier IV

Systems Engineering Capstone Certificate
Commencing Thursday, 31 March 2021
Program Delivered via Distance Learning
Sponsor Code: OPEN Enrollment (130-223O)

	Course Lineup	
Qtr	**Year/Quarter**	**Course Title**
1	AY22/Spring	SE4151 Systems Development & Integration (3-2)
2	AY22/Summer	SE3201 Engineering Systems Conceptualization (2-4)
3	AY23/Fall	SE3202 Engineering Systems Design (2-4)
4	AY23/Winter	SE3203 Engineering Systems Implementation & Operations (2-4)

Application Deadline: 3 January 2022

DEGREE PROGRAMS

- **311-224O** – SE Master's Degree with R&ME Focus
- **711-224P** – SEM Master's Degree with SPM Focus

Note: 582 - PhD in SE candidates can start any quarter

STACKABLE CERTIFICATE PROGRAMS

- **Tier I (282-224O/P)** – Certificate in SE with Enterprise Systems Focus
- **Tier II (131-224O)** – Certificate in Systems Capability and Design
- **Tier II (171-224P)** – Certificate in Systems Integrated Development
- **Tier III (134-224O)** – Certificate in Aviation Systems
- **Tier III (135-224O)** – Certificate in Systems Test & Evaluation
- **Tier III (173-224P)** – Certificate in Systems Program Management
- **Tier IV (130-224O)** – Certificate in Systems Engineering Capstone

The Call for Applications will be released in January 2022. Applications will be due on 28 March 2022.

Open enrollment rate: AY22 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 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.

- Chair, SE Department: Oleg Yakimenko– oayakime@nps.edu
  - 831-656-2826
- 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
  - 831-915-9581
- GEAC Student Support: - GEACStudCoord@nps.edu
  - Program support for students
  - 831-656-3579

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

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SE Fundamentals 282 Certificate	SE/SEM Core Certs 103-SCD/107-SID	SE/SEM Domain Certs 232/242/130s/170s	Other Domain Certs 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 130-SEC/170-SEMC	SEM Masters 711/721/722	SE Masters 311/312	PhD in SE 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

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

▼ **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**