



# Certificate and Course Catalog

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### Introduction to Our Programs:

MORS offers certificates and courses in a variety of topics. Certificates are 5 days long, while courses range from half a day to 3 days. These programs provide the next level of professional development. They involve practical knowledge to equip you with essential information and to help prepare you to excel in your professional environment. MORS strives to provide both members and non-members an opportunity to learn relevant national defense analytical subjects often not covered by academia or commercial sources.

#### Benefits include:

- The addition of a unique skill in your resume that sets you apart from your peers
- Access to relevant courses for your career advancement
- Increased and broadened knowledge about a subject matter
- A demonstrated dedication to your profession

**For more information about our offerings, contact Liz Marriott at [liz.marriott@mors.org](mailto:liz.marriott@mors.org).**

#### **We also offer customized training opportunities!**

If you would like to set up a custom, private course for your organization, please reach out to Liz Marriott at [liz.marriott@mors.org](mailto:liz.marriott@mors.org) or Tina Yan at [tina.yan@mors.org](mailto:tina.yan@mors.org).



# Certificate in Critical Skills for Analytics Professionals (CSAP)

## Overview:

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The course begins with the theoretical basis for effective and accurate presentation of project results in a military or government setting. From there, participants will attain an enhanced understanding of the methods and techniques utilized in effective analysis project management and discuss best practices in overcoming challenges.

MORS has partnered with Virginia Tech to offer this certificate. Participants will receive a number Continuing Education Units (CEUs) upon completion, in accordance with the number of contact hours determined by Virginia Tech.

## Objectives:

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Our expert instructors will cover a diverse range of topics and skills that are critical to the analyst, including but not limited to:

- Developing and defining the problem set – how to research and construct the problem in order to understand the context and scope that will provide the most timely, useful results
- Reaching and reading the customer – ways to establish professional relationships and communicate the problem and solution
- Leading an analytics project team or functioning as an effective member
- Gleaning information from subject matter experts – how to plan and conduct interviews with experts to gain information and data
- Gleaning information from groups – how to plan and conduct group elicitation sessions with committees and other working groups in order to develop and assess alternatives, uncertainties, and value and risk preferences
- Communicating results verbally and non-verbally – how to deliver the results and conclusions of the analytics process
- Conveying worth – how to construct recommendations rooted in solid analytical methods that are useful, executable, and impactful

# Draft Agenda:

Time (Eastern)	Day 1:	Day 2	Day 3	Day 4	Day 5
10:00 AM	Welcome & Introduction to OR 101	Background and Introduction to Non-Verbal Communication	Introduction to Ethics	Introduction: What is an Analytics Project?	Course Review & Introduction to Practicum
			Establishing Guidelines for Professional Analytic Practice		
11:00 AM	Stage Setting: Doing Your Homework			Project Management Framework	Team Research & Presentation Development
	Exercise: Elicitation Experiences	Break	Break	Setting Up Your Analytics Project	Break
12:00 PM					
	Lunch	Presenting Yourself & Your Topic	Responsibilities of a Professional Analyst	Communication, Communication, Communication	Practicum Scenario Overview
1:00 PM					Design Review
		Lunch			Team Collaboration
	Exercise: CLAS		Lunch	Lunch	Presentations
2:00 PM		Visual Analytics			
	Foundations of Success: Thinking Complex		Introduction to Tools	Controlling Your Analytics Project	Lunch
			Tool Selection & Considerations		Development Review
3:00 PM	Exercise: Critical Thinking		Data Analysis Tools & Methods	Exercise	Team Collaboration
	Break		Predictive Methods		Presentations
	Model Simple	Break			Deployment Review
4:00 PM					
	Exercise: Notional Modeling Problem	Practical Exercise	Break	Break	Team Collaboration
5:00 PM					Presentations
	Build an Argument		Prescriptive Methods	Project Closeout	
6:00 PM	Tell a Story	Presentations	Conclusion	Wrap-Up & Conclusion	Wrap-Up & Conclusion

## Tuition:

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Employer	Member	Non-Member
MORS Government Sponsor*	\$2,700	\$2,800
U.S. Federal Government	\$2,800	\$2,900
National Research Partner (IDA employees only)	\$2,755	\$2,850
All Others	\$2,900	\$3,000

\* MORS Government Sponsor organizations include Center for Army Analysis, HQDA/DCS Program G-8; Marine Corps Combat Development and Integration; Naval Operations, N81; SAF/SA, Studies and Analysis; OSD, A&S; and DHS S&T/OSE/ORA

**Register:** <https://www.mors.org/Certificate-in-Critical-Skills-for-Analytics-Professionals-CSAP>

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## Overview:

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The MORS Certificate in Critical Tools for Analytics Professionals (CTAP) is a five-day course designed for analysts seeking to gain familiarity with the levels of analytics and obtain hands-on experience with Operations Research (OR) tools. This course is constantly evolving to adhere to the most current analytical standards and methods, due to the increasing threat of cyber security and other emerging threats.

MORS has partnered with Virginia Tech to offer this certificate. Participants will receive a number Continuing Education Units (CEUs) upon completion, in accordance with the number of contact hours determined by Virginia Tech.

## Objectives:

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Our expert instructors will cover a range of topics and tools that are critical to the analyst, including:



- Statistics and probability
- Regression and time series
- Optimization and simulation
- Decision analysis
- Causal and route analysis
- Practicum

## Draft Agenda:

Time (Eastern)	Day 1:	Day 2	Day 3	Day 4	Day 5
10:00 AM	Welcome & Introduction	Sample Mean, Central Limit Theorem, P-Values, and Hypothesis Testing	Simulation	Introduction to Decision Analysis	Introduction to Bayesian Networks
				Decision Making Challenges	
	Summarizing Data, Part I		Monte Carlo Methods	Foundations	
11:00 AM				Exercise	
				Selecting a Decision Process	Bayesian Networks in Practice
12:00 PM	Lunch		Lunch	Lunch	
1:00 PM	Summarizing Data, Part II	Linear Regression and Connection to P-Values	Introduction to Optimization	Crafting Objectives and Value Measures	Leaning Bayesian Networks from Data
			Integer Optimization		
2:00 PM			Exercise	Exercise	Designing Alternatives
	Break				
3:00 PM	Summarizing Data, Part III and Introduction to Python	Logistic Regression	Nonlinear Optimization	Deterministic MODA	Causal Analysis
4:00 PM		Exercise	Break	Exercise	

5:00 PM	Analytic Problem Framing		Sensitivity Analysis	Break	Practicum
				Portfolio Analysis	
6:00 PM	Conclusion	Conclusion			Wrap-Up & Conclusion

## Tuition:

Employer	Member	Non-Member
MORS Government Sponsor*	\$2,700	\$2,800
U.S. Federal Government	\$2,800	\$2,900
National Research Partner (IDA employees only)	\$2,755	\$2,850
All Others	\$2,900	\$3,000

\* MORS Government Sponsor organizations include Center for Army Analysis, HQDA/DCS Program G-8; Marine Corps Combat Development and Integration; Naval Operations, N81; SAF/SA, Studies and Analysis; OSD, A&S; and DHS S&T/OSE/ORR

**Register:** <https://www.mors.org/Certificate-in-Critical-Tools-for-Analytics-Professionals-CTAP>



## Overview:

The MORS Certificate in U.S. National Security Risk Analysis is a five-day course designed for all levels of analysts seeking to understand the basic concept of risk as it relates to national security. Probability, uncertainty, consequences, fear, and human control all come into play when it comes to risk. The course will start by exploring typically fuzzy problems and move them towards quantitative risk evaluation. Throughout the course, participants will survey several quantitative risk methodologies, including fault trees, value-based decisions, the Lagrange-multiplier method, and modern data visualization.

Students will learn quantitative risk evaluation, build probability models, compute the value of information, and survey best practices for communicating risk. The course will start by exploring

typically fuzzy problems and moving them towards quantitative risk evaluation. Participants will survey several quantitative risk methodologies, including fault trees, value-based decisions, Lagrange-multiplier method, and modern data visualization.

MORS has partnered with Virginia Tech to offer this certificate. Participants will receive a number Continuing Education Units (CEUs) upon completion, in accordance with the number of contact hours determined by Virginia Tech.

## Objectives:

Our expert instructors will introduce participants to a variety of key tools and methods used in risk analysis as it pertains to national security. Participants will learn quantitative risk evaluation, build probability models, compute the value of information, and survey best practices for communicating risk. By the end of the course, participants will be able to:

- Conceptualize national security risk problems
- Structure adversarial risk problems with shifting evidence
- Survey quantitative risk methodologies
- Use Monte Carlo Simulation for risk analysis
- Communicate risk to executives, analysts, and the public

**Requirements:** Computer with Excel and administrative privileges to download SIPMath (a simulation tool) and Netica (Bayesian network / Influence diagram)

## Draft Agenda:

Time (Eastern)	Day 1	Day 2	Day 3	Day 4	Day 5
10:00 AM	Welcome	Using Monte Carlo Simulation for Risk Analysis: Model Building	Making Decisions with Risk and Uncertainty: Verifying & Validating Your Model	Risk Management & Risk Communication	Risk Applications & Bayesian Models: Computational Creativity
	Definitions & Pillars of Modern Risk: Developing Your Risk Intelligence	Security System Screening Exercise	Utility Exercise		
11:00 AM					
12:00 PM	Lunch	Lunch	Lunch	Lunch	Lunch
1:00 PM				Examples of Risk Models	



	Introduction to Quantitative Risk Concepts	Probability Distributions	Decision Making with Uncertainty		Bayesian Updating
2:00 PM					
			Value of Information Exercise	Decision Tree Exercise	Value of Information Exercise II
3:00 PM		Break	Distribution Exercise		
			Break		
	Calibration of Probabilities	Break	Intelligent Adversary	Break	Break
4:00 PM		Monte Carlo Simulation		Break	Bayesian Networks, Influence Diagrams, & Netica
				Risk Communication	
5:00 PM					
			Expert Elicitation Exercise	Risk Communication Exercise	Closing Thoughts & Questions
6:00 PM					

## Tuition:

Employer	Member	Non-Member
MORS Government Sponsor*	\$2,700	\$2,800
U.S. Federal Government	\$2,800	\$2,900
National Research Partner (IDA employees only)	\$2,755	\$2,850
All Others	\$2,900	\$3,000

\* MORS Government Sponsor organizations include Center for Army Analysis, HQDA/DCS Program G-8; Marine Corps Combat Development and Integration; Naval Operations, N81; SAF/SA, Studies and Analysis; OSD, A&S; and DHS S&T/OSE/ORA

**Register:** <https://www.mors.org/Certificate-in-Risk-Analysis>

# Certificate in Emerging Techniques in Analytics and Data Science

## Overview:

The MORS Certificate in Emerging Techniques in Analytics and Data Science is designed to provide a broad overview of many of the emerging techniques in analytics and the data sciences. The course is intended for mid-level journeymen analysts looking to gain a breadth of knowledge in analytic techniques and junior analysts seeking to understand what is out there to learn. Throughout the course, there will be demonstrations and hands-on code to see how these algorithms run on actual data. Due to time constraints and the breadth of the course, detailed coding and individual development of models will be left to follow on future potential courses in Python and R.

MORS has partnered with Virginia Tech to offer this certificate. Participants will receive a number Continuing Education Units (CEUs) upon completion, in accordance with the number of contact hours determined by Virginia Tech.

## Objectives:

Our expert instructors aim to teach participants about emerging techniques in analytics and data science, enabling participants to understand the strengths and weaknesses of various techniques and cut through the marketing hype to show how implementation can actually help national security organizations.

## Draft Agenda:

Time (Eastern)	Day 1:	Day 2	Day 3
9:00 AM	Introduction	Unsupervised Learning	Text Mining and Natural Language Processing (NLP)
	Organizations & Roles in AI/ML	Supervised Learning	
10:00 AM	Case Studies in the Intelligence Community & DoD	Emerging World of Artificial Neural Networks	
			Computer Vision (CV)

11:00 AM	Introduction to Digital Transformation		
12:00 PM	Lunch	Lunch	Lunch
1:00 PM	Deeper Dive into Machine Learning	Reinforcement Learning and Stochastic Optimization	Artificial Intelligence (AI) Activity
2:00 PM		Network Science & Graphs	Organizational Implementation
3:00 PM	Hands-On Exercise	IC/DoD Problem Framing Exercise	Future Topics
			Wrap-Up & Conclusion
4:00 PM			

## Tuition:

Employer	Member	Non-Member
MORS Government Sponsor*	\$1,620	\$1,680
U.S. Federal Government	\$1,680	\$1,740
National Research Partner (IDA employees only)	\$1,653	\$1,710
All Others	\$1,740	\$1,800

\* MORS Government Sponsor organizations include Center for Army Analysis, HQDA/DCS Program G-8; Marine Corps Combat Development and Integration; Naval Operations, N81; SAF/SA, Studies and Analysis; OSD, A&S; and DHS S&T/OSE/ORA

**Register:** <https://www.mors.org/Certificate-in-Emerging-Techniques-in-Analytics-and-Data-Science>



# Certificate in Excel Functions for Data Analysts

## Overview:

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The MORS Certificate in Excel Functions for Data Analysts is a five-day course designed for beginner to mid-level analysts who wish to enhance their Excel skills and see what is new. Participants will learn how to conduct analysis and prepare briefs for decision makers using only Microsoft Office products. The course begins with the basics to provide a strong foundation, then builds up to a more in-depth look at various tools and functions within Excel. On the final day, participants will create and present a Capstone Project that combines everything they have learned throughout the week.

During the first 3 days (Week 1), the course material is taught with in-course work and overnight homework to reinforce the material covered. Between weeks, a practice Capstone Project is presented to provide more opportunities to reinforce the material. Finally, during the last 2 days (Week 2) an actual Capstone Project is presented: the first day of Week 2, each student works the capstone project independently, while the second day, students are grouped into teams to present the results of the Capstone to the instructors.

MORS has partnered with Virginia Tech to offer this certificate. Participants will receive a number Continuing Education Units (CEUs) upon completion, in accordance with the number of contact hours determined by Virginia Tech.

## Objectives:

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Through a combination of lectures and group work, our expert instructors will introduce participants to a variety of different Excel tools and functions, including:

- Probability, statistics, and simulation
- Creating charts
- Data query and analysis
- Visual basic and dashboards

**Requirements:** Computer equipped with Excel 2016 or beyond (anything before 2016 will not work), plus three add-ins that will be used in the course: Data Analysis Toolpak, Solver, and Visual Basic Editor

# Draft Agenda:

Time (Eastern)	Day 1:	Day 2	Day 3	Day 4	Day 5
10:00 AM	Welcome & Introductions	Day 1 Review	Day 2 Review	Week 1 Review	Capstone Project Review
11:00 AM	Module 1: Excel Basics - Getting Started	Module 3: Creating Charts	Module 5: Visual Basic & Dashboards		
	Break	Break	Break		
12:00 PM	Excel Basics (Continued)	Creating Charts (Continued)	Visual Basic & Dashboards (Continued)		
1:00 PM	Lunch	Lunch			
			Lunch		
2:00 PM	Module 2: Probability, Statistics, and Simulation	Module 4: Data Query and Additional Analysis			
3:00 PM	Break	Break			
			Break		
4:00 PM	Probability, Statistics, and Simulation (Continued)	Data Query and Additional Analysis (Continued)	Presenting Results to Senior Leaders (Continued)		
	In-Class Homework	In-Class Homework	Wrap-Up	Capstone Project Review	Capstone Project Presentations
5:00 PM					
6:00 PM	Wrap-Up	Wrap-Up	Optional Homework Time or Capstone Project Q&A	Wrap-Up & Team Assignment	Wrap-Up & Conclusion



## Tuition:

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Employer	Member	Non-Member
MORS Government Sponsor*	\$2,700	\$2,800
U.S. Federal Government	\$2,800	\$2,900
National Research Partner (IDA employees only)	\$2,755	\$2,850
All Others	\$2,900	\$3,000

\* MORS Government Sponsor organizations include Center for Army Analysis, HQDA/DCS Program G-8; Marine Corps Combat Development and Integration; Naval Operations, N81; SAF/SA, Studies and Analysis; OSD, A&S; and DHS S&T/OSE/ORR

**Register:** <https://www.mors.org/Events/Certificates/Certificate-in-Excel-Functions-for-Data-Analysts>



## Overview:

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The MORS Certificate in Survey Process is a four-day course for all analysts seeking to gain a practical understanding in the various aspects of research survey methodology. The course will cover the basic principles of survey research and will provide participants with guidance in the design and execution of high-quality surveys.

MORS has partnered with Virginia Tech to offer this certificate. Participants will receive a number Continuing Education Units (CEUs) upon completion, in accordance with the number of contact hours determined by Virginia Tech.

## Objectives:

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Our expert instructor will guide participants through the key aspects of properly designing, fielding, and analyzing surveys. A variety of topics will be covered, including:

- Survey instrument design

- How to avoid pitfalls and ensure the capture of quality data
- Rules of thumb and pain-points when crafting survey questions
- Modes of data collection
- Statistical estimation
- Methods and use cases for survey data analysis

## Draft Agenda:

Time (Eastern)	Day 1:	Day 2	Day 3	Day 4
9:00 AM	Welcome & Introductions	Introduction to Question Development	Exercise: Dog in a Hat	Sampling: Non-Response in Surveys
			Design: Pre-Test & Focus Groups	
10:00 AM	Picture a Survey		Exercise: Pre-Test Questions	Analysis: Post Collection of Survey Data
	Break			
11:00 AM	What is a Survey?	Break	Lunch	Exercise: Survey Analysis Plan
		Questionnaire Design		
	Bias Effect	Exercise: Question Design	Inference & Error in Surveys	Lunch
12:00 PM				
	Lunch	Lunch	Sampling: Frames and Coverage Error	Analysis: Case Study Descriptive
1:00 PM				
	Bias Effect (Continued)	Question Design	Break	Analysis: Case Study Advanced Analytics
2:00 PM				
			Sampling: Design and Sampling Errors	Survey Analysis: Tool
3:00 PM	Break			
	Problem Framing	Pre-Test		Exercise & Course Wrap-Up
4:00 PM				

## Tuition:

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Employer	Member	Non-Member
MORS Government Sponsor*	\$2,700	\$2,800
U.S. Federal Government	\$2,800	\$2,900
National Research Partner (IDA employees only)	\$2,755	\$2,850
All Others	\$2,900	\$3,000

\* MORS Government Sponsor organizations include Center for Army Analysis, HQDA/DCS Program G-8; Marine Corps Combat Development and Integration; Naval Operations, N81; SAF/SA, Studies and Analysis; OSD, A&S; and DHS S&T/OSE/ORA

**Register:** <https://www.mors.org/Certificate-in-Survey-Process>



## Overview:

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The MORS Certificate in Wargaming is a five-day course designed to enhance analyst capability and knowledge in multiple aspects of professional games, including research, design, development, execution, analysis, and reporting. Through a combination of lectures and exercises, participants will learn the theory behind wargames before diving into research design and execution. Building on Peter Perla's theory of the "Architect, Artist, and Analyst" model for game designers, the course includes material that covers each style of wargame design. The course culminates in a practicum where participants will be divided into teams to develop and execute their own game for an assigned analytical problem.

MORS has partnered with Virginia Tech to offer this certificate. Participants will receive a number Continuing Education Units (CEUs) upon completion, in accordance with the number of contact hours determined by Virginia Tech.

# Objectives:

Our expert instructors will guide participants through the key aspects of wargaming and aid them in creating their own game on the final day of the course. Along the way, participants will learn about the following:

- Defining a wargame
- A brief history of wargames
- Building blocks of game design
- Adjudication
- Strategic gaming
- Wargame graphics
- Game analysis

# Draft Agenda:

Time (Eastern)	Day 1	Day 2	Day 3	Day 4	Day 5
<b>10:00 AM</b>	Welcome	Welcome	Game Analyses	Game Design: Analyst	Game Design: Analyst
	What is a Wargame?	Design Basics			
<b>11:00 AM</b>	Designing Wargames is Hard - Definitions	Design Advances Process			
<b>12:00 AM</b>	Lunch	Lunch	Lunch	Lunch	Lunch
<b>1:00 PM</b>	The Axes of Wargaming	Design Advanced Elements	Optional Topic	Strategic Gaming	Practicum
<b>2:00 PM</b>	Desinging as the Architect	Tasks to Games			
<b>3:00 PM</b>	Break	Break			
	Brief History of Wargame	Adjudication			
<b>4:00 PM</b>				Break	

	Wargame: Kriegsspiel	Game Deconstruction	Wargame Graphics	Game Design: Analyst	
5:00 PM					
			Facilitation		
6:00 PM					

## Tuition:

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Employer	Member	Non-Member
MORS Government Sponsor*	\$2,700	\$2,800
U.S. Federal Government	\$2,800	\$2,900
National Research Partner (IDA employees only)	\$2,755	\$2,850
All Others	\$2,900	\$3,000

\* MORS Government Sponsor organizations include Center for Army Analysis, HQDA/DCS Program G-8; Marine Corps Combat Development and Integration; Naval Operations, N81; SAF/SA, Studies and Analysis; OSD, A&S; and DHS S&T/OSE/ORA

**Register:** <https://www.mors.org/Certificate-in-Wargaming>



## Overview:

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The MORS Certificate in Cyber Wargaming examines the challenges of gaming cyber through a combination of lectures and practical exercises. Lectures will focus on games and game design, along with the application of game design to cyber issues. Practical exercises will give participants the chance to experience different types of cyber games, allowing them to assess requirements, plan budgets, practice response procedures, and examine player actions during



play. These games will place them in decision-making roles during a simulated real-world problem—be it historical, contemporary, or projected into the future—and are currently used by decision makers within government, industry, and academia to examine policy issues and outcomes. At the end of the course, students will research, design, and present their own cyber game.

MORS has partnered with Virginia Tech to offer this certificate. Participants will receive a number Continuing Education Units (CEUs) upon completion, in accordance with the number of contact hours determined by Virginia Tech.

## Objectives:

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Our expert instructors will introduce participants to the various ways that game design can be used to address the challenges of cyber operations and policy. Participants will:

- Learn how to think about cyber technology and processes to build effective games
- Build an understanding of how to represent cyber capabilities in games, including how to match the technical layers of game play with operational and strategic layers
- Build games directly addressing cyber operations
- Develop an awareness of the gaming tools available for cyber, and begin to associate specific game techniques with various cyber gaming requirements

## Draft Agenda:

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Time (Eastern)	Day 1	Day 2	Day 3	Day 4	Day 5
10:00 AM	Welcome	Welcome	Cyber Gaming for Fun and Profit	Information Operations	Matrix Games
	Introduction: Games, Game Design, and Cyber	Tactical Cyber Games, Adjudication			
11:00 AM					
12:00 AM	Lunch	Lunch	Lunch	Lunch	Lunch
1:00 PM					

1:00 PM	Types of Wargame Designs	Cyber in Title 10 Wargames	Why Cyber Games are Wrong	Hiding and Showing Information in Games	Cyber-Mediated Trust in Games									
2:00 PM	Game Design Fundamentals	Operational Cyber Games	Cyber Warfare, Lessons from Recent Events		Hiding and Showing Information in Games	Practical Game Design Exercise								
3:00 PM	Break	Break	Break				Hiding and Showing Information in Games	Practical Game Design Exercise						
	Exercise: Enterprise Defender	Strategic Cyber Games	Cyber Gaming for Business	Break					Practical Game Design Exercise					
4:00 PM	Discussion									Strategic Cyber Games	Cyber Gaming for Business	Break	Practical Game Design Exercise	
5:00 PM					Discussion	Strategic Cyber Games								Cyber Gaming for Business
6:00 PM	Discussion	Strategic Cyber Games	Cyber Gaming for Business	Information Operations			Practical Game Design Exercise							

## Tuition:

Employer	Member	Non-Member
MORS Government Sponsor*	\$2,700	\$2,800
U.S. Federal Government	\$2,800	\$2,900
National Research Partner (IDA employees only)	\$2,755	\$2,850
All Others	\$2,900	\$3,000

\* MORS Government Sponsor organizations include Center for Army Analysis, HQDA/DCS Program G-8; Marine Corps Combat Development and Integration; Naval Operations, N81; SAF/SA, Studies and Analysis; OSD, A&S; and DHS S&T/OSE/ORA

**Register:** <https://www.mors.org/Certificate-in-Cyber-Wargaming>



## Overview:

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The MORS Certificate in Gaming Homeland Security is a five-day course designed for professionals seeking to learn basic game design principles through the lens of homeland security. Participants will learn through a combination of lectures and exercises, with the exercises being designed to help build confidence in the topic of homeland security game design. At the end of the course, students will research, design, and present their own game.

MORS has partnered with Virginia Tech to offer this certificate. Participants will receive a number Continuing Education Units (CEUs) upon completion, in accordance with the number of contact hours determined by Virginia Tech.

## Objectives:

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Our expert instructors will introduce participants to a variety of games pertaining to homeland security, with topics including:

- Emergency response games
  - Natural and man-made disasters
  - Transportation events
  - Terrorism and public health response
  - Mass casualty events, active shooter scenarios, and active policing
- How to support the DHS Homeland Security Exercise and Evaluation Program (HSEEP)
- Local, state, and national-level games
- The National Exercise Program games
- Games that explore the dynamics of response operations

# Draft Agenda:

Time (Eastern)	Day 1	Day 2	Day 3	Day 4	Day 5	
10:00 AM	Welcome	Welcome	Types of Games: Operations, Logistics & Management	Gaming CT and LEA	Review of Previous Days	
	Introduction: How Does Homeland Security Operate?	Specific Domains and Problems				
		Game Design Issues				
11:00 AM						
12:00 AM	Lunch	Lunch		Lunch	Lunch	Lunch
1:00 PM	Designing Games for Homeland Security	Technical Issues			Practicum	
2:00 PM	Types of Games and Exercises	Topic Specific Modeling	DHS Games Local	Gaming CT with and Without WMD		
3:00 PM	Break	Break	Break			
	Tools of the Game Designer	Tips for Success		Break		
4:00 PM	Case Studies	What Does Not Work	DHS Games: National			
5:00 PM		Case Studies				
6:00 PM						

## Tuition:

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Employer	Member	Non-Member
MORS Government Sponsor*	\$2,700	\$2,800
U.S. Federal Government	\$2,800	\$2,900
National Research Partner (IDA employees only)	\$2,755	\$2,850
All Others	\$2,900	\$3,000

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**Register:** <https://www.mors.org/Certificate-in-Gaming-Homeland-Security>



## Overview:

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The MORS Designing Tactical Games Short Course is a three-day course that focuses on building tactical games. Tactical games deal with maneuver and combat during individual battles. This requires the game designer to manage large numbers of complex variables in ways that allow the players to make the appropriate Warfighting decisions. Whether this is done using computer or manual techniques, it demands no small degree of simulation—the interaction of forces, the effects of human factors and technology, and the effects of the environment on combat. Any good wargame strives to produce realistic adjudications and outcomes, but the realism of tactical games is tested even more stringently because the players can more easily relate game mechanics and adjudication to their own personal experiences. All of this makes designing tactical games different—and even more challenging—than designing operational or strategic games. This class will examine some of these challenges and possible solutions in both theoretical and practical terms.

MORS has partnered with Virginia Tech to offer this certificate. Participants will receive a number Continuing Education Units (CEUs) upon completion, in accordance with the number of contact hours determined by Virginia Tech.



# Objectives:

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- Our expert instructors will address tactical games according to the different combat domains: ground, naval, and air. Participants will learn varying aspects of game design and explore future challenges from these perspectives, including but not limited to:
- Designing exploratory games—that is, games to create or test new tactics, weapon systems, or operational concepts
- Ground games:
  - How good design must address basic concepts such as mission, time, space, forces, and command relationships
  - How to bring all the variables together to create a realistic tactical environment for players to engage in ground warfare
- Different ways of representing ground combat based on a wide range of commercial and professional games
- Air and Naval games:
  - Integration of multi-domain operations (MDO) from space to surface into the overall air-battle kill chain
  - How do build games that focus on air combat operations, and air combat operations in support of ground forces
  - Methods for abstracting and estimating air combat values
  - Putting ordnance on not only the target, but the entire kill chain, from identification to battle damage assessment

Additional topics, depending on participant interest

# Draft Agenda:

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Time (Eastern)	Day 1	Day 2	Day 3
10:00 AM	Welcome	Defining the Air War in a Joint Environment	Issues in Designing Modern Naval Games
	Designing Tactical Games: What We Can Learn	Introduction to Air War	
11:00 AM			
12:00 AM	Lunch	Lunch	Lunch

1:00 PM	Designing Tactical Games: The Variables	Air to Air Games and Adjudication	
			Exercise
2:00 PM			
3:00 PM	Break	Break	
			Break
	Multidomain Operations at the Tactical Edge	Operational Air Games	
4:00 PM			
5:00 PM	Learning by Doing		Building Blocks of Modern Naval Games
6:00 PM			

## Tuition:

Employer	Member	Non-Member
MORS Government Sponsor*	\$1,620	\$1,680
U.S. Federal Government	\$1,680	\$1,740
National Research Partner (IDA employees only)	\$1,653	\$1,710
All Others	\$1,740	\$1,800

\* MORS Government Sponsor organizations include Center for Army Analysis, HQDA/DCS Program G-8; Marine Corps Combat Development and Integration; Naval Operations, N81; SAF/SA, Studies and Analysis; OSD, A&S; and DHS S&T/OSE/ORR

**Register:** <https://www.mors.org/Designing-Tactical-Games-Course>



# Gaming Cyber and Information Operations Short Course

## Overview:

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The MORS Gaming Cyber and Information Operations Short Course is a three-day course that focuses on building professional games designed to explore, train, or educate on issues surrounding cyber security and information operations. Oftentimes, cyber games are seen solely through the lens of computer-based games, and information operations games are thought to be too hard to execute and adjudicate. This course strives to dispel those beliefs and posits that manual games that focus on organization, conceptualization, and experimentation have a place in these spaces as well. The course will consist of three primary sections: game design, gaming cyber security at the tactical, operational, and strategic levels, and gaming information operations. A combination of lectures and exercises will enhance the learning process.

MORS has partnered with Virginia Tech to offer this certificate. Participants will receive a number of Continuing Education Units (CEUs) upon completion, in accordance with the number of contact hours determined by Virginia Tech.

## Objectives:

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Our expert instructor will teach participants how to build the best game for a sponsor's objectives by focusing on the following topics:

- Understanding the types of games that are available and how they relate to gaming at the strategic, operational, and tactical levels of cyber
- Building games that focus on information operations, or incorporating information operations into large game systems
- The role of matrix games
- How to build realistic tactical games without becoming overwhelmed by details
- How to build analytical tools for tactical adjudication of cyber games
- Handling adjudication of social engineering and deception

# Draft Agenda:

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Time (Eastern)	Day 1	Day 2	Day 3
10:00 AM	Welcome	Introduction: Cyber and Games	Exercise: Enterprise Defender
	Information Operations in Games	Designing Cyber Games	
11:00 AM			
12:00 AM	Lunch	Lunch	Lunch
1:00 PM	Exercise: Information Operations	Designing C- Suite Cyber Games	Adjudication
2:00 PM			
3:00 PM	Break	Break	Break
	Infomation Operations in Games	Strategic, Operational and Tactical Games	Cyber in Games/ Matrix Games
4:00 PM			
5:00 PM			
6:00 PM			

## Tuition:

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Employer	Member	Non-Member
MORS Government Sponsor*	\$1,620	\$1,680
U.S. Federal Government	\$1,680	\$1,740
National Research Partner (IDA employees only)	\$1,653	\$1,710
All Others	\$1,740	\$1,800

\* MORS Government Sponsor organizations include Center for Army Analysis, HQDA/DCS Program G-8; Marine Corps Combat Development and Integration; Naval Operations, N81; SAF/SA, Studies and Analysis; OSD, A&S; and DHS S&T/OSE/ORR

**Register:** <https://www.mors.org/Gaming-Cyber-and-Information-Operations-Course>



## Overview:

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The MORS Gaming Emergency Response to Disease Short Course is a three-day course focused on the application of professional games to problems associated with public health response. It covers pandemic response games—both national and international—as well as the problems of novel and unique organisms, biological warfare and terrorism, mental health, and chronic disease games.

MORS has partnered with Virginia Tech to offer this certificate. Participants will receive a number of Continuing Education Units (CEUs) upon completion, in accordance with the number of contact hours determined by Virginia Tech.

## Objectives:

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Our expert instructors will teach participants how to identify unique and challenging aspects involved in designing games involving all elements of published health response, and provide



solutions to these challenges. The course will incorporate current and emerging lessons from the COVID-19 pandemic response.

## Draft Agenda:

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Time (Eastern)	Day 1	Day 2	Day 3
10:00 AM	Welcome	Strategic Operational, and Tactical Game Examples	Emergency Response Process
	The Problem of Disease Response	PANDEMIC TEMPEST	
11:00 AM			
	Lunch	Lunch	Lunch
12:00 AM			
1:00 PM	Game Design Fundamentals	Exercise: Nature or Nurture	Disease and Emergency Response
			Ways to Apply Games to Disease Response
2:00 PM			
	Break	Break	Break
3:00 PM			
	Basic Biology and Epidemiology in Games	Matrix Games	Exercise: Building Emergency Response Games
4:00 PM		Exercise: Building a Disease Response Game	
5:00 PM			Exercise: Practicum and Discussion
6:00 PM			

## Tuition:

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Employer	Member	Non-Member
MORS Government Sponsor*	\$1,620	\$1,680
U.S. Federal Government	\$1,680	\$1,740
National Research Partner (IDA employees only)	\$1,653	\$1,710
All Others	\$1,740	\$1,800

\* MORS Government Sponsor organizations include Center for Army Analysis, HQDA/DCS Program G-8; Marine Corps Combat Development and Integration; Naval Operations, N81; SAF/SA, Studies and Analysis; OSD, A&S; and DHS S&T/OSE/OR

**Register:** <https://www.mors.org/Gaming-Emergency-Response-to-Disease-Course>



## Overview:

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Decision-making is increasingly being driven by vast quantities, velocities, and varieties of data. Operations research (or analytics) offers many techniques for deriving insight from data, but the field of OR may be intimidating to those without a formal OR, computer science, or math background. The one-day MORS Executive Seminar provides senior decision-makers a basic toolkit for getting the most out of quantitative analysis. Over the course of several modules, this seminar will introduce the core techniques and processes of operations research in the context of real-world problems.

## Objectives:

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Our expert instructors aim to help participants become better-informed consumers of quantitative analysis by covering the following topics:

- What is analysis – and what isn't
- Dealing with uncertainty
- Matching models to problems

- Statistical learning and statistical computing
- Ethics in analysis
- Critiquing analysis

## Draft Agenda:

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Time (Eastern)	
9:00 AM	Welcome
	What Is Analysis and What Isn't
10:00 AM	Dealing with Uncertainty
	Matching Models to Problems
11:00 AM	Lunch
	Statistical Learning
12:00 PM	
	Ethics in Analysis
1:00 PM	Critiquing Analysis
	Case Study & Capstone
2:00 PM	
	Closing Remarks
	Final Q&A
3:00 PM	
4:00 PM	
5:00 PM	

## Tuition:

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Employer	Member	Non-Member
MORS Government Sponsor*	\$540	\$560
U.S. Federal Government	\$560	\$580
National Research Partner (IDA employees only)	\$550	\$570
All Others	\$580	\$600

\* MORS Government Sponsor organizations include Center for Army Analysis, HQDA/DCS Program G-8; Marine Corps Combat Development and Integration; Naval Operations, N81; SAF/SA, Studies and Analysis; OSD, A&S; and DHS S&T/OSE/ORR

**Register:** <https://www.mors.org/Executive-Seminar>

# Certificate in Operations Research and Analytics

## Overview:

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The MORS Certificate in Operations Research and Analytics is a two-week course designed for analysts who are looking to broaden their scope of knowledge and hone their existing skills—or develop new ones. This course is taught through a combination of lectures, practical exercises, and group work. It culminates in a practicum on the final day that brings everything together and allows participants to work in groups and present their results to the class.

This course was originally designed for the Australian Department of Defence, Defence Science and Technology Group. We are continuously working to improve this offering and can modify aspects of this course if requested.

## Objectives:

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Our expert instructors aim to help participants enhance their analytical skillset with the following topics:

- Presenting results in a military or government setting

- Developing and defining problems in order to understand the context and scope that will provide the most timely, useful results
- Reaching and reading the client or organization leadership
- Communicating results verbally and non-verbally – how to deliver the results and conclusions of the analytics process
- Conveying worth – how to construct recommendations rooted in solid analytical methods that are useful, executable, and impactful
- Probability, statistics, and simulation in Microsoft Excel
- Data query and analysis
- Charts, visual basic, and dashboards
- Defining, designing, and adjudicating wargames
- Matrix games
- Designing surveys and ensuring the capture of quality data
- Methods of survey analysis
- Soft systems methodology and SODA
- Campaign analysis

## Draft Agenda:

Time	Day 1:	Day 2	Day 3	Day 4	
10:00 AM	Welcome & Introductions	Introduction: Ethics	Introduction: Excel	Review Capstone Project	
		Activity: Does Context Matter?	Module 1: Excel Basics		
		Presenting Results in a Military/Government Setting: Stage Setting - Doing Your Homework		Exercise: Ethics, Integrity, Legality	Translating Equations
11:00 AM	Establishing Guidelines for Professional Analytic Practice		Break		
			Module 2: Probability, Statistics, & Simulation	Break	
	Module 5: Visual Basic & Dashboards				
12:00 PM		Exercise: Elicitation Experiences	Responsibilities of the Professional Analyst	Break	
	Lunch				
		Exercise: Bias & Ethical Traps	Probability Functions & Random Number Generation	Lunch	
1:00 PM					Exercise: Practical Application of Ethical Thinking
	Lunch				
		Module 6: Presenting Results to Senior Leaders			

	Foundations of Success: Thinking Complex	Introduction: Tools	Module 3: Creating Charts	
3:00 PM		Case Study: Violence Reduction Program		
		Exercise: Critical Thinking		History & Evolution of Operations Research
	Break		In-Class Homework	
4:00 PM	Model Simple	Descriptive Statistics: "The Shape of Data"		
				Exercise: Notional Modeling Problem
	Predictive Methods: Regression & Neural Networks			
5:00 PM		Build an Argument		
	Prescriptive Methods: Time Series, Simulation, Optimization		Homework Review	
		Tell a Story	Introduce Capstone Project	Capstone Project & Wrap-Up
6:00 PM				

Time	Day 5	Day 6	Day 7
10:00 AM	What Is Non-Verbal Communication? How Does It Affect Your Effectiveness?	What Are Surveys?	What Is a Wargame?
		Why Use Surveys?	
			Why Do Wargames Matter? Lessons From History
11:00 AM	Presenting Yourself and Your Topic: Body Language, Voice Tone, Using the Right Words	Decision Bias	Wargame Design
		Survey Assessment & Question Build	Exercise: Task to Game
		Visual Analytics: What Is Your Data Showing? What Does the Audience Need?	Adjudication
12:00 PM	Lunch	Break	Break
1:00 PM			
2:00 PM			
3:00 PM			
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		Exercise: Question Build	
		Minimizing Survey Error	
	Break	Survey Analysis & Tools	
	Group Practical Exercise	Exercise: Survey Pre-Test	Special Topics: Matrix Games, Games & Technology
5:00 PM	Group Presentations	Pre-Test Results & Wrap-Up	
	Conclusion		
6:00 PM		Conclusion	

Time	Day 8	Day 9	Day 10
10:00 AM	Introduction: Soft Skills	Defining Campaign & Warfare Analysis	Compelling Analytics: Trust & Communication
	Soft Systems Methodology		
	The Delphi Method		
11:00 AM			Break
	Break	Break	
	Strategic Ops Development & Analysis	Campaign Analysis in Joint Planning and Campaign Assessment	Compelling Analytics: Experience & Different Audiences
12:00 PM			
	SWOT		
	Lunch		Geographic Information Systems (GIS)
1:00 PM			
	Analytic Hierarchy Process	Methods and Tools in Campaign Analysis	Examples of Analytics Applied Throughout History
2:00 PM			
	Social Data Analytics		Lunch
3:00 PM		Team Exercise	Practicum Introduction
	Break		Development Review
	Review & Wrap-Up	Break	

4:00 PM		Full Class Practical Exercise	Team Collaboration & Presentation Development
5:00 PM	Optional Time for Additional Discussion of Methods	Review	Presentations
6:00 PM		Conclusion	Conclusion & Wrap-Up

## Tuition:

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\$70,000

If you are interested in setting up this two-week course for your organization, please email Liz Marriott at [liz.marriott@mors.org](mailto:liz.marriott@mors.org) or Tina Yan at [tina.yan@mors.org](mailto:tina.yan@mors.org).

# Professional Development

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As your professional Society, MORS strives to provide our members the resources to meet the challenges of a constantly evolving field. Whether your goal is to stay on top of the latest techniques and information or just trying to find an outlet to learn something new, MORS has a program to fit your needs.

- The annual **MORS Symposium, Workshops and Education Colloquium** offer opportunities to present your work and receive valuable feedback from your peers, as well as the opportunity to hear from experts and participate in small group problem-solving discussions.
- The **MORS Certificate Program and Tutorials** offer in-depth exploration of skills, techniques and Operations Research disciplines.
- **MORS Communities of Practice and Webinars** offer convenient online learning and discussion opportunities.
- The **Phalanx Magazine, MOR Journal** and **MORS Books** offer members an opportunity to publish and read about the latest techniques and developments in Operations Research.

All MORS programs are run by experts in their field and are designed to reinvigorate your Professional Development.

## Training Bulletin

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MORS offers a wide variety of professional development opportunities each year including focused Workshops, certificate courses, short courses, and the MORS Symposium. MORS created the Training Bulletin document as a way for the community to learn about everything we offer in a consolidated document. View the most current Training Bulletin at <https://www.mors.org/Professional-Development>.

The Training Bulletin is a great resource that will provide you the dates, location, cost, and a short description of each event. To join the mailing list and receive this in your email on the first of every month, sign up at <https://www.mors.org/Professional-Development>.



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