**Research Methods, Data Analysis, and Reporting to Support DoD Security Programs
(CDSE ED 508)**

Defense Security Service (DSS)
Center for Development of Security Excellence (CDSE)
Education Division


**SAMPLE COURSE SYLLABUS***


1.  **Course Description/Overview**

The main purpose of the *Research Methods, Data Analyisis, and Reporting to Support DoD Security Programs* course is to introduce students to quantitative and qualitative methods for conducting meaningful inquiry and research.  They will gain an overview of research intent and design, methodology and technique, format and presentation, and data management and analysis informed by commonly used statistical methods. The course will develop each student's ability to use this knowledge to become more effective as security leaders in the DoD. These tasks include:

- Developing a hypothesis, a research problem and related questions
- Framing the problem with the correct research methodology
- Collecting data that accurately addresses the research problem
- Measuring the effectiveness of a program
- Using data to make decisions
- Providing technical guidance to contractors for inclusion in contract documents related to research projects
- Evaluating feasibility of research proposals
- Presenting data to support programs to decision makers and other consumers

The course will provide an overview of the important concepts of research design, data collection, statistical and interpretative analysis, and final report presentation. The focus of this course is not on mastery of statistics but on the ability to use research in the DoD Security environment.

Each week students will work through lessons that present security-specific readings and research and/or statistics-related concepts that bring to life examples of how the weekly topic applies to security. This will allow students to clearly understand how the course material relates to their jobs as security professionals.

2.  **Target Audience/Prerequisites**

The target audience for this course is DoD civilian and military defense security professionals from a variety of specializations. This course is designed at the collegiate level.

This course has no prerequisites.

3.  **Student Outcomes/Objectives**

This course will be designed to enable students to meet the following final terminal learning objectives:

- Act as an educated consumer of data
- Prepare a preliminary research design for projects in their subject matter areas
- Accurately collect, analyze and report data
- Present complex data or situations clearly
- Review and analyze research findings that affect their agency


*Sample syllabus is subject to change each semester.

### 4. Delivery Methods/Course Requirements

This is a graduate-level distance-learning course in research methods and statistics for security professionals. The course will consist of readings and presentations, participation in the discussion forum, exercises, and written assignments.

The assigned course readings draw from a variety of resources, such as DoD and GAO reports, articles and essays on research methods, and examples of effective and ineffective presentation of statistical information. Students are expected to familiarize themselves with the assigned topic and readings each week and should be prepared to participate in the online discussion forum to discuss the readings critically.

### 5. General Course Requirements

Class participation is both important and required. If, due to an emergency, students are not able to respond to a discussion prompt in the week it is assigned, they must contact the instructor by e-mail and will be expected to post their response in the following week.

It is expected that assignments will be submitted on time (by midnight the day they are due). However, it is recognized that students occasionally have serious problems that prevent work completion. If such a dilemma arises, students should contact the instructor in a timely fashion.

The completion of all readings assigned for the course is assumed. Since the class will be structured around discussion, completion of readings and all class assignments is crucial.

### 6. Academic Integrity

Please refer to CDSE's Academic Integrity Policy for guidance on adhering to their high standards of academic integrity and security. You must acknowledge that you have read the CDSE policy by posting to the appropriate discussion Forum in Sakai, where you will find a copy of this policy. You will be held to these standards for every writing assignment you submit for this course.

### 7. Grading / Assignments

The following provides an approximate breakdown of how each assignment contributes to the overall performance in the class.

| | |
|---|---|
| Class Participation | 20% |
| Weekly Assignments (ten) | 40% |
| Mock RFP | 15% |
| Final Research Project | 25% |

**Class Participation (20%):**
The participation grade includes active engagement in the class discussion forum, and conducting peer reviews.

The discussion forums are a rich way to enhance the online learning experience, however success depends on participation. Discussions include both student-instructor and student-student interactions. Please respond to other students' prompts and propose discussion points as this is a chance to share your knowledge and experience.

For many weeks there are two discussion forums:
1. Based on a question posed by the instructor
2. Based on a security-focused article

Students must post at least two peer responses each week—one to each forum topic as appropriate or to two different students if only one topic is required

The purpose of the discussion is to increase students' understanding of the material and demonstrate their ability to complete and comprehend the readings.

To achieve full credit for participation, students must respond thoughtfully to all weekly discussion prompts, post a response in both discussion forums, and write in full and complete sentences in the discussion forum. The participation grade will also include the peer review of the final paper. To achieve full credit, provide **constructive criticism** when conducting peer reviews of other students' work. Students are expected to participate in supportive, collegial discussion in the classroom.

**Weekly Assignments (40%):**
Weekly assignments include forum discussions and small-scale exercises aimed at helping students to apply the weekly lesson objectives. The time burden for each assignment is not expected to exceed two hours per week.

**Mock Request for Proposal (RFP) (15%):**
The first major written assignment is to prepare the technical section of a request for proposal for a research project or statistical data collection. The students should address procedures for collecting, analyzing, and reporting the data. The RFP should include a sample design, data collection method, data description, and if required, statistical analysis technique employed. The Mock RFP should be 3-5 pages in length.

**Final Research Paper (25%):**
The final research paper requires students to write a report for decision-makers and other consumers.. Research topics should be on a security-related issue for which the students have access to statistical data. Exploring a current workplace problem throughout the course would be extremely beneficial. Potential topics include: trends in violations, serious security incidents, financial reports, and proposals for new programs or policies. Prior approval of the topic for the final research paper is required.
Students will research the topic thoroughly in order to fully explore and analyze the varying perspectives regarding the selected issue. They must then formulate their own recommendations for resolution of the issue, including justifications and specific strategies for implementation of the recommendations. Students will properly cite all research referenced in the report, using the format laid out in the *Chicago Manual of Style*.  The paper is expected to be between 20 and 25 pages in length, including front and back matter. Sections of the paper will be developed throughout the course.

Students must have a draft of the report at least 75% complete and ready for peer review by another student by Week 13. During Week 14, students will review each other's reports and provide constructive criticism. Students will have the remainder of the semester to complete the report. The Final Report is due at the end of the semester.

A rubric for the grading process is included at the end of the syllabus.

### 8.  Course Feedback

The course instructor will provide multiple opportunities for students to provide constructive feedback on course delivery and content over the period of the course. Additionally, students will provide feedback on one another's work through posts in the discussion forum and formal peer reviews of identified writing assignments. Finally, the instructor will provide written feedback to students on all assignments.

### 9.  Course Textbooks
There is one textbook required for this course. Additional readings will include academic papers and DoD reports. The text is:

John Creswell
Research Design: Qualitative, Quantitative, and Mixed Methods Approaches
Paperback: 304 pages
Publisher: SAGE Publications, Inc; Fourth Edition (March 14, 2013)
Language: English
ISBN-10: 1452226105
ISBN-13: 978-145222610

## 10. Course Outline

The course is divided into six topic areas:

- Part 1: Introduction and Basic Research Concepts ( 2 weeks)
- Part 2: Qualitative Research Methods (2 weeks)
- Part 3: Quantitative Research Methods and Statistics (6 weeks)
- Part 4: Mixed Methods Research (1 week)
- Part 5: Reporting Results of Data Analysis (3 weeks)
- Part 6: Completing the Research Project (2 weeks)

The following table outlines the 16-week course agenda and the exercises and assignments. Students will additionally participate in weekly discussion forums, which are not noted here.

| Lesson/ Week | Topics | Student Assignments Due |
|---|---|---|
| 1 | Introduction to The Process of Conducting Research | **Due:**<br>• Introduction forum<br>• Acknowledge CDSE Integrity Policy<br>• Forum 1a: Research in DoD<br>• Forum 1b: Article Review |
| 2 | Research Design Introduction<br><br>• Steps in the Process of Research<br>• Identifying a hypothesis and/or research problem, specifying a purpose, creating research questions<br>• Reviewing literature<br>• Ethics of research and informed consent | **Due:**<br>• Forum 2a: Research Designs in DoD<br>• Forum 2b: Article Review<br>• Exercise 1: Identifying Research Designs and Creating Hypotheses<br><br>(Note: Submit proposed final research project topic to instructor during Week 2) |
| 3 | Introduction to Qualitative Research<br>• Essence of Qualitative Data<br>• Sampling<br>• Collection Techniques<br>   o Biography<br>   o Phenomenology<br>   o Grounded Theory<br>   o Ethnography<br>   o Case Study | **Due:**<br>• Forum 3a: Components of Qualitative Research<br>• Forum 3b: Qualitative Research Study Review<br>• Exercise 2: Identifying Qualitative Research Problems in your Workplace |

| Lesson/ Week | Topics | Student Assignments Due |
|---|---|---|
| 4 | Interpreting Qualitative Data<br>• Qualitative Data Analysis Procedures<br>• Coding<br>• Thematic development | **Due:**<br>• Forum 4a: Features of Qualitative Data Analysis<br>• Forum 4b: Qualitative Research Study Review<br>• Exercise 3: Framing the Research Problem as a Qualitative Study |
| 5 | Introduction to Quantitative Research<br>• Essence of Quantitative Data<br>• Collection and Analysis Techniques | **Due:**<br>• Forum 5a: Making Predictions<br>• Forum 5b: Article Review |
| 6 | Sampling Concepts<br>• Defining the Target Population<br>• Representative Sample<br>• Potential Consequences of Unrepresentative Sampling (Gaming the System)<br>• Over Representative Subgroups / Weighting<br>• Design Effect<br>• Sampling Methods (Cluster, Stratified, Simple Random) | **Due:**<br>• Forum 6a: Census vs Sample<br>• Forum 6b: Article Review<br>• Exercise 4: Sampling Questions |
| 7 | Quantitative Data Collection Instruments<br>• Choosing a good instrument<br>• Interval and Ratio Scales | **Due:**<br>• Forum 7a: Identifying Poor Data Collection Instruments<br>• Forum 7b: Research Review |
| 8 | Introduction to Applied Statistics<br>• Identifying the dependent and independent variables<br>• Confidence levels<br>• Math that manipulates data | **Due:**<br>• Forum 8a: DoD Security Programs<br>• Forum 8b: Research Review<br>• Exercise 5: Describing Results of Time Series Analysis |
| 9 | Descriptive Statistics<br>• Summarizing and describing a collection of data<br>• Univariate and bivariate analysis<br>• Mean, mode and standard deviation<br>• Percentages and Ratios<br>• Histograms<br>• Identifying randomness and uncertainty in data | **Due:**<br>• Forum 9a: Descriptive stats in DoD Reports<br>• Forum 9b: Report Review<br>• Exercise 6: Graph Preparation<br>• Exercise 7: Descriptive Statistics |

| Lesson/ Week | Topics | Student Assignments Due |
|---|---|---|
| 10 | Inferential Statistics<br>• Drawing inference from data<br>• Modeling assumptions<br>• Identifying Patterns<br>• Regression analysis<br>• T-test<br>• Analysis of Variance<br>• Correlations<br>• Chi-square | **Due:**<br>• Forum 10a: Statistical differences<br>• Forum 10b: Report Review<br>• Exercise 8: Inferential (Comparative) Statistics<br>• Exercise 9: Framing the Research Problem as a Quantitative Study |
| 11 | Introduction to Mixed Methods Research<br>• Advantages<br>• Design Components<br>• Explanatory Mixed Methods Framework<br>• Exploratory Mixed Methods Framework | **Due:**<br>• Forum 11a: Qualitative vs Quantitative Research in the Security Realm<br>• Forum 11b: Framing the Research problem as a Mixed Methods Study<br>• Draft Mock RFP Uploaded for Peer Feedback |
| 12 | Data Mining – Finding the Patterns and Problems in the World of Data | **Due:**<br>• Mock RFP |
| 13 | Writing About Quantitative Findings | **Due:**<br>• Forum 13: Draft Final Research Paper for Peer Review |
| 14 | Writing About Qualitative or Mixed Methods Findings | **Due:**<br>• Forum 14: Peer Review Two Other Students' Papers |
| 15 | Critically Critiquing Research Reports | **Due:**<br>• Exercise 10: Reflection Paper on Peer Review Process |
| 16 | Applying Research in the Security Environment | **Due:**<br>• Final Research Paper |

## 11. Grading Rubrics

Pass/fail grading criteria for each graded assignment are listed below. Note: A final numeric (percentage) score for each student who completes the class and the dates of attendance will be recorded in the student's training record in CDSE's "STEPP" learning management system. The record in STEPP will also indicate that students who achieve a final score of 80% or higher passed the course.

| | PASS | | FAIL | |
|---|---|---|---|---|
| | **Exceed Expectations** | **Meets Expectations** | **Somewhat Meets Expectations** | **Below Expectations** |
| **Class Participation** | Engages other students; Encourages more participation | Provides meaningful insights; responds to other students | Only asks questions in the discussion forum; Only engages with the instructor | Does not participate in discussion forum |

| | PASS | | FAIL | |
|---|---|---|---|---|
| | **Exceed Expectations** | **Meets Expectations** | **Somewhat Meets Expectations** | **Below Expectations** |
| | Initiates discussions to link lessons to the DoD and the workplace | Keeps discussions active | Tries to dominate discussion forum | Is argumentative and off-topic |
| **Weekly Written Assignment** | Demonstrates a mastery of the concepts | Demonstrates an understanding of the concepts | Submits a completed assignment with conceptual errors | Does not understand the concepts presented |
| | Essay responses are well thought-out and presented in a compelling fashion | Essay responses include all elements in the questions | Essay responses include the main point but do not include all elements | Essay responses provided are simplistic |

## DISCUSSION FORUMS

| Points | Grading Rubric for Discussions |
|---|---|
| 10 | Evidences thoughtful consideration of the topic , provides sound feedback, uses clear prose, which is absent of grammatical errors and/or typos. Posting fully engages with the ongoing dialogue in a rhetorically, suitable fashion and fosters further discussions on the topics, even exploring new and different perspectives. The posting verifies that you are facilitating learning between yourself and your fellow students. |
| 8 | Evidences adequate consideration of the topic, provides feedback, uses clear prose with minimal grammatical errors and/or typos. Posting attempts to engage with the ongoing dialogue, may foster further discussions on the topics, and occasionally explores new and different perspectives. The posting indicates a strong attempt to facilitate learning between yourself and your fellow students. |
| 6 | Minimal engagement with the topics. Does little to advance the discussion underway, and may even detract from it. Limited engagement with fellow students. |
| 0 | No posting, late posting without prior coordination with instructor, or a post that is brief and barely relevant. |

**MOCK RFP**

| | PASS | | FAIL | |
| --- | --- | --- | --- | --- |
| | **Exceed Expectations** | **Meets Expectations** | **Somewhat Meets Expectations** | **Below Expectations** |
| **Research Design** | Research purpose/program need is defined and clearly described | Research purpose/program need is defined, and described at a high level | Research purpose/program need is not well defined and is not well described | No research purpose/program need is included |
| | Overall research design is described accurately and completely | Overall research design is described accurately, but lacks some detailed description | Overall research design is correctly identified, but narrative includes errors in the description, or description is not included | Overall research design is neither described accurately nor completely |
| | Selected research design is justified, and is appropriate to meet the program need | Selected research design is appropriate to meet the program need, the choice is not justified | Selected research design only partially meets the program need | Selected research design is not appropriate to meet the program need |
| **Data Collection Method** | Data collection method is defined and described accurately | Data collection method is defined and described somewhat accurately | Data collection method is defined, but not described accurately | Data collection method is not defined or described accurately |
| | Data collection method is appropriate for the research design, and is justified | Data collection method is appropriate for the research design, and choice of approach is partially justified | Data collection method is not appropriate for the research design, and choice of approach is partially justified | Data collection method is not appropriate for the research design, and choice of approach is not justified |
| | Description of the data collection method includes accurate representation of the sample population and coverage issue from the target population | Description of data collection method includes accurate representation of the sample population | Description of data collection method includes representation of the sample population with some inaccuracies | Description of data collection method does not include representation of the sample population |
| **Description of Data** | A complete description of the desired output, including rationale, is included | A complete description of the desired output is included | Data description is not detailed or some data is not included | A complete description of the desired output is not included |

| | PASS | | FAIL | |
|---|---|---|---|---|
| | **Exceed Expectations** | **Meets Expectations** | **Somewhat Meets Expectations** | **Below Expectations** |
| **Data Analysis** | Desired data analysis is accurately defined and described | Desired data analysis is described accurately, but lacks some detailed description | Desired data analysis is correctly identified, but narrative includes errors in the description, or description is not included | Desired data analysis is neither described accurately nor completely |
| | | Data analysis method aligns with the type of data collected | | Data analysis method does not align with the type of data collected |
| | | Data analysis method aligns with the research design | | Data analysis method does not align with the research design |
| **Overall** | No significant grammatical or spelling errors | Minor errors cause few disruptions in meaning | Errors do not cause the writing to be unclear, but weaken the effectiveness of the communication | Severe and/or frequent errors cause writing to be unclear and difficult to read |
| | All supporting research is properly cited | Research is properly cited most of the time | Research is inconsistently cited | Research is not cited at all |

**FINAL RESEARCH PAPER**

| | PASS | | FAIL | |
|---|---|---|---|---|
| | **Exceed Expectations** | **Meets Expectations** | **Somewhat Meets Expectations** | **Below Expectations** |
| **Data Analysis** | The data analysis methods are defined and clearly described | The data analysis methods are defined, and described at a high level | The data analysis methods are not well defined, and are not well described | The data analysis methods are not defined |
| | Overall research design is described accurately and completely | Overall research design is described accurately, but lacks some detailed description | Overall research design is correctly identified, but narrative includes errors in the description, or description is not included | Overall research design is neither described accurately nor completely |

|  | PASS | | FAIL | |
| --- | --- | --- | --- | --- |
|  | **Exceed Expectations** | **Meets Expectations** | **Somewhat Meets Expectations** | **Below Expectations** |
| **Data Collection Method** | Data collection method is defined and described accurately | Data collection method is defined and described somewhat accurately | Data collection method is defined, but not described accurately | Data collection method is not defined or described accurately |
|  | Description of the data collection method includes accurate representation of the sample population and coverage issue from the target population | Description of data collection method includes accurate representation of the sample population | Description of data collection method includes representation of the sample population with some inaccuracies | Description of data collection method does not include representation of the sample population |
| **Presentation** |  | The paper is addressed to High Level Officials/decision makers |  | The paper is presented as a student paper |
| **Hypothesis Testing (Quantitative or Mixed Methods)** | A well-stated hypothesis is the core of the quantitative presentation | A research hypothesis is clearly presented | Research questions are presented instead of a hypothesis; or hypothesis is not clearly stated | Neither hypothesis nor research questions are presented |
|  | All statistical analysis is derived from the research hypothesis | Statistical analysis supports the testing of the hypothesis | Some statistical analysis tests the hypothesis; some addresses additional issues | Statistical analysis is not related to hypothesis |
| **Research Problem and Questions (Qualitative or Mixed Methods)** | A well-stated research problem and questions are at the core of the qualitative presentation | A research problem and questions are clearly presented | Research problem and questions are not clearly stated | Neither research problem nor research questions are presented |
|  | All qualitative analysis supports the research problem and questions | Most data analysis supports the problem and questions | Some analysis regards the problem; some addresses additional issues | Data analysis is not related to research problem or questions |
| **Topic** | The topic addresses a current issues of great concern to the DoD | The topic addresses a current concern of the DoD. | The topic is related to DoD security | The topic has already been resolved |

|  | PASS | | FAIL | |
| --- | --- | --- | --- | --- |
|  | **Exceed Expectations** | **Meets Expectations** | **Somewhat Meets Expectations** | **Below Expectations** |
|  | The paper presents a new solution that is supported by data | The paper provides statistical to support one alternative solution over another | The paper uses data to confirm previous decision | The paper presents no solutions |
| **Overall** | No significant grammatical or spelling errors | Minor errors cause few disruptions in meaning | Errors do not cause the writing to be unclear, but weaken the effectiveness of the communication | Severe and/or frequent errors cause writing to be unclear and difficult to read |
|  | All supporting research is properly cited | Research is properly cited most of the time | Research is inconsistently cited | Research is not cited at all |