

## Graduate Module — Research Methods in Procurement & Capture (GC 530)

*The session-by-session teaching plan for GC 530. Follows the module contract in `modules/module-template.md`, extended to the 14-week graduate arc. Statistics are taught from the ground up but at graduate pace; the course is a cumulative research journal that becomes the thesis/capstone proposal.*

**Audience:** graduate students in the MS program. **Prerequisites:** program foundations (GB 510 for students who need a statistics refresher). **Readings:** the doctrine and literacy folders, plus the course reader. **Data:** the public record (award data, registries, forecasts).

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### Session 1 — The research–practice loop

**Learning objectives.** By the end of this session, students can: (1) explain why capture professionals need research; (2) distinguish folklore from testable claims; (3) turn a folklore claim into a researchable question.

**Session plan (75 min).** - Open (5 min): “Name a claim the discipline makes that has never been tested.” - Teach (25 min): doctrine/03 + doctrine/07. The learning loop; folklore vs. evidence; the research-practice gap. - Apply (25 min): write three folklore claims from the discipline and turn each into a researchable question. - Discuss (15 min): “Why does the discipline run on so much folklore — and what would change if it did not?” - Close (5 min): assignment.

**Discussion prompts.** 1. Which folklore claim would you most like to test, and why? 2. What would the discipline look like with a working research base?

**Homework / reading.** Read doctrine/03 and doctrine/07. Deliverable: three researchable questions from folklore claims.

**Comprehension check.** What is the research-practice loop? What makes a claim researchable?

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### Session 2 — Research design

**Learning objectives.** By the end of this session, students can: (1) distinguish descriptive, causal, and predictive designs; (2) state a hypothesis; (3) identify confounds.

**Session plan (75 min).** - Open (5 min): “What is the difference between ‘what happened’ and ‘what caused it’?” - Teach (25 min): the course reader on research design + doctrine/05. Descriptive, causal, predictive; the counterfactual; confounds. - Apply (25 min): for one folklore claim, state the design that would

test it and what would count as evidence. - Discuss (15 min): “Why is causal language so common in a discipline that so rarely runs experiments?” - Close (5 min): assignment.

**Discussion prompts.** 1. When is a descriptive study the right design? 2. What would a causal study of pWin require?

**Homework / reading.** Read the course reader and doctrine/05. Deliverable: a design memo for one testable claim.

**Comprehension check.** What are the three research designs? What is a confound?

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### Session 3 — Measurement

**Learning objectives.** By the end of this session, students can: (1) move from concept to variable to measure; (2) state validity threats; (3) state reliability concerns.

**Session plan (75 min).** - Open (5 min): “What is ‘capture readiness,’ exactly?” - Teach (25 min): the course reader on measurement + doctrine/05. Concepts, variables, measures; validity and reliability. - Apply (25 min): operationalize “capture readiness” and “price competitiveness” into measurable variables; state the validity threats. - Discuss (15 min): “Which of the discipline’s key concepts is hardest to measure — and what do we do about it?” - Close (5 min): assignment.

**Discussion prompts.** 1. What does a measure gain and lose when it is operationalized? 2. How do you know you are measuring the thing, not a proxy?

**Homework / reading.** Read the course reader. Deliverable: an operationalization exercise with validity threats.

**Comprehension check.** What is operationalization? What is the difference between validity and reliability?

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### Session 4 — The public data substrate

**Learning objectives.** By the end of this session, students can: (1) enumerate the public data sources; (2) state their strengths and gaps; (3) match data to a research question.

**Session plan (75 min).** - Open (5 min): “What can the public record actually tell us?” - Teach (25 min): literacy/where-the-money-flows + the course reader on procurement data. Award data, forecasts, registries, debriefs, bid protests. - Apply (25 min): for a research question, identify the public data that would answer it and what it cannot tell you. - Discuss (15 min): “What is the biggest

gap in the public record — and how do researchers work around it?” - Close (5 min): assignment.

**Discussion prompts.** 1. What biases lurk in award data? 2. When is the public record enough, and when is it not?

**Homework / reading.** Read literacy/where-the-money-flows. Deliverable: a data memo mapping a research question to public sources and their limits.

**Comprehension check.** What are the public data sources? What can they not tell you?

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## Session 5 — Descriptive statistics

**Learning objectives.** By the end of this session, students can: (1) describe a distribution; (2) compute central tendency and spread; (3) describe before explaining.

**Session plan (75 min).** - Open (5 min): “What does the distribution of award values in a market look like?” - Teach (25 min): the course reader on statistics. Distributions, mean, median, spread, shape. - Apply (25 min): describe the distribution of award values in a real segment; state what is typical and what is exceptional. - Discuss (15 min): “Why describe before explain? What does a distribution reveal that an average hides?” - Close (5 min): assignment.

**Discussion prompts.** 1. When is the median a better summary than the mean? 2. What does a skewed award distribution tell a competitor?

**Homework / reading.** Read the course reader. Deliverable: a descriptive analysis of a real market segment.

**Comprehension check.** What is a distribution? Why describe before explain?

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## Session 6 — Sampling and inference

**Learning objectives.** By the end of this session, students can: (1) define a population and a sample; (2) identify sampling bias; (3) state what a sample can and cannot support.

**Session plan (75 min).** - Open (5 min): “You have 200 of 2,000 awards. What can you conclude?” - Teach (25 min): the course reader on inference. Samples, populations, bias, confidence. - Apply (25 min): for a research question, define the population, a defensible sample, and the lurking biases. - Discuss (15 min): “What is the most common sampling bias in procurement research?” - Close (5 min): assignment.

**Discussion prompts.** 1. Why does a convenience sample of visible awards mislead? 2. What does “confidence” actually mean?

**Homework / reading.** Read the course reader. Deliverable: a sampling memo for a research question.

**Comprehension check.** What is sampling bias? What does a sample support?

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## Session 7 — Hypothesis testing

**Learning objectives.** By the end of this session, students can: (1) state a null and alternative; (2) run a simple test; (3) distinguish statistical from practical significance.

**Session plan (75 min).** - Open (5 min): “Do HUBZone set-asides differ in average award size? How would you know?” - Teach (25 min): the course reader on hypothesis testing. Null, alternative, significance, the logic of the test. - Apply (25 min): test a simple hypothesis about a public award dataset. - Discuss (15 min): “When is a statistically significant result practically meaningless?” - Close (5 min): assignment.

**Discussion prompts.** 1. What does a p-value actually tell you? 2. How big a difference matters in capture, not just in statistics?

**Homework / reading.** Read the course reader. Deliverable: a hypothesis test on a public dataset.

**Comprehension check.** What is a null hypothesis? What is the difference between statistical and practical significance?

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## Session 8 — Correlation and regression

**Learning objectives.** By the end of this session, students can: (1) read a correlation honestly; (2) interpret a simple regression; (3) state three confounds an analysis cannot rule out.

**Session plan (75 min).** - Open (5 min): “Awards correlate with past performance. So what?” - Teach (25 min): the course reader on regression. Association vs. causation; the coefficient; the confounds. - Apply (25 min): estimate a simple relationship in public data and name the confounds. - Discuss (15 min): “Why is ‘correlation is not causation’ the most important sentence in this course?” - Close (5 min): assignment.

**Discussion prompts.** 1. What confounds the past-performance → win relationship? 2. When can a regression support a causal claim?

**Homework / reading.** Read the course reader. Deliverable: a regression exercise with a confound list.

**Comprehension check.** What is the difference between association and causation? What is a confound?

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## Session 9 — Midterm

**Learning objectives.** By the end of this session, students demonstrate: (1) design critique; (2) measurement discipline; (3) inference honesty.

**Session plan (75 min).** - Open (5 min): exam logistics. - Exam (65 min): a published procurement study is distributed. Students critique its design, measurement, and inference, and redesign the weak link. - Close (5 min): what to review for the second half.

**Discussion prompts.** n/a (examination).

**Homework / reading.** Review weeks 1–8. Deliverable: midterm submission.

**Comprehension check.** n/a.

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## Session 10 — Qualitative methods

**Learning objectives.** By the end of this session, students can: (1) design a small case study; (2) write a document-analysis protocol; (3) state when qualitative work is the right method.

**Session plan (75 min).** - Open (5 min): “When do the numbers not carry the question?” - Teach (25 min): the course reader on qualitative methods. Case study, document analysis, interviews; the transparent protocol. - Apply (25 min): design a small case study (e.g., of an incumbent displacement play) with a transparent evidence protocol. - Discuss (15 min): “What does a qualitative study gain and lose compared to a quantitative one?” - Close (5 min): assignment.

**Discussion prompts.** 1. When is a single case the right design? 2. How do you keep a qualitative study honest?

**Homework / reading.** Read the course reader. Deliverable: a qualitative study design with an evidence protocol.

**Comprehension check.** When is a case study the right method? What makes qualitative work disciplined?

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## Session 11 — Mixed methods

**Learning objectives.** By the end of this session, students can: (1) combine quantitative and qualitative evidence; (2) use triangulation; (3) design a mixed study.

**Session plan (75 min).** - Open (5 min): “One study with numbers and two cases. What does the combination buy you?” - Teach (25 min): the course reader on mixed methods. Triangulation; when the methods reinforce and when they conflict. - Apply (25 min): sketch a mixed design that combines award data with two qualitative cases to answer a research question. - Discuss (15 min): “What do you do when the numbers and the cases disagree?” - Close (5 min): assignment.

**Discussion prompts.** 1. What does triangulation actually confirm? 2. When do conflicting methods teach you the most?

**Homework / reading.** Read the course reader. Deliverable: a mixed-design sketch.

**Comprehension check.** What is triangulation? What do mixed methods buy you?

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## Session 12 — Research ethics

**Learning objectives.** By the end of this session, students can: (1) state the ethics of procurement research; (2) draw the wall between research and espionage; (3) write the data boundaries of a study.

**Session plan (75 min).** - Open (5 min): “Your employer has proprietary win data. Can you publish a study from it?” - Teach (25 min): doctrine/04 + the course reader on research ethics. Public data, employer data, competitor data; the researcher’s obligation to the truth. - Apply (25 min): write the ethical boundaries of your proposed study — what data you will use, what you will not, and why. - Discuss (15 min): “Where is the line between research and espionage in this discipline?” - Close (5 min): assignment.

**Discussion prompts.** 1. What data should a procurement researcher never touch? 2. How does the public-record discipline make research cleaner?

**Homework / reading.** Read doctrine/04. Deliverable: an ethics memo for your proposed study.

**Comprehension check.** What are the ethics of procurement research? Where is the wall between research and espionage?

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## Session 13 — Writing the research proposal

**Learning objectives.** By the end of this session, students can: (1) write a research proposal; (2) argue for a design; (3) state limitations.

**Session plan (75 min).** - Open (5 min): “Write the proposal a skeptical reviewer would fund.” - Teach (25 min): the course reader on proposal writing. Question, design, data, analysis, ethics, limitations. - Apply (25 min): workshop drafts — the room attacks the design. - Discuss (15 min): “What makes a research proposal fundable?” - Close (5 min): assignment.

**Discussion prompts.** 1. What is the weakest part of most proposals — question, design, or data? 2. How do you write limitations without undermining your own study?

**Homework / reading.** Read the course reader. Deliverable: the full research proposal draft.

**Comprehension check.** What are the parts of a research proposal? Why must limitations be explicit?

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## Session 14 — The proposal defense

**Learning objectives.** By the end of this session, students can: (1) present a research proposal; (2) defend it before a panel; (3) revise from feedback.

**Session plan (75 min).** - Open (5 min): defense logistics. - Defenses (50 min): each student presents their proposal; the panel and peers probe. - Discuss (15 min): “What did the strongest proposals share?” - Close (5 min): bridge to GC 690/690T and the doctorate.

**Discussion prompts.** 1. What made a proposal survive the panel? 2. What would you change in your own design after hearing the others?

**Homework / reading.** Course synthesis. Deliverable: final research proposal, revised after defense.

**Comprehension check.** What does a defensible research proposal look like? What is the bridge to the capstone and thesis?