

Rec#	College and Course #	Inquiry-rich Competencies	Teaching Engagement Strategy	Indicators of Student Success
Exceptional Entries				
111	renr405500	<input checked="" type="checkbox"/> Formulate good questions and/or identify problems(s) within the discipline <input checked="" type="checkbox"/> Examine, identify, and gather information regarding the questions(s) and/or problems. <input checked="" type="checkbox"/> Analyze, interpret, and present results <input checked="" type="checkbox"/> Formulate conclusions(s) and/or select the best solution with appropriate justification <input checked="" type="checkbox"/> Evaluate the worth and importance of those conclusion(s) – including their placement in a social, environmental and historical context, as appropriate. Exceptional	<p>Students are provided with generic <u>knowledge</u> on how to <u>structure a problem</u>. They are then learning from organized learning modules the skill sets needed. They <u>assemble</u> by themselves the <u>corresponding skills</u> in order to <u>formulate a problem-solving process</u>. Students then go through the process, quite often by <u>learning from anticipated errors</u>, to <u>build up solutions</u> toward problem-solving.</p>	<p>1. The ability to <u>convert</u> between quality and numeric information for all contributing factors relevant to problem-solving onto a uniform, normalized scale. 2. The ability to <u>integrate</u> normalized <u>contributing factors</u> into a unified overall index. 3. The ability to <u>show graphically and spatially</u> the contribution from each factor and the summation result from all factors that explain the problem-solving process. 4. The ability to <u>summarize</u> problem-solving process and result, graphically, spatially and artistically, in such package as PowerPoint; and the ability to <u>present</u> the document professionally to the rest of the class.</p>
			<p>1. Students are to <u>pick</u> from a common geographic information database the items relevant to their problems. 2. Students are encouraged to go <u>find</u> extra <u>information</u> from sources <u>outside the common database</u>, e.g. the GIS Department of a local jurisdiction. Often data from such extraneous sources will form an integral part of information needed to complete problem-solving.</p>	<p>1. The ability to <u>extract</u> from the common database specific information needed for problem-solving. 2. The ability to <u>approach outside source(s)</u> for additional information that will enhance the problem-solving process. 3. The ability to <u>integrate</u> on their own the <u>data</u> from <u>various sources</u> for <u>problem-solving</u>.</p>

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			<p>1. Students <u>learn the basics</u> of analytic modules available in various parts of a comprehensive Geographic Information System (GIS). 2. Students learn to <u>select and sequence</u> the analytic modules and learn to <u>apply</u> them to data in appropriate formats in a problem-solving process. 3. Students <u>combine</u> the structured <u>GIS modules/data with a master non-GIS algorithm to come up with integrated results.</u></p>	<p>1. Students need to go through a series of small projects to learn to <u>assemble</u> analytic modules incrementally toward solving a more complex problem. Each project is depicted in a separate learning module. They will not be able to "skip" any of them to advance. 2. Each module, including the Final Term Project, requires students to <u>think critically</u>. It is not just mechanically entering the commands. As such, students <u>will not be able to advance through the gate-keeping mechanism toward successful problem-solving without cultivating real critical thinking ability.</u></p>
			<p>At every step of the way along a problem-solving process, <u>partial results</u> from a contributing factor <u>will have to be acquired</u> through robust GIS and non-GIS computations. The master methodology deployed also ensures that each contributing factor will have to be <u>properly formatted</u> and incorporated to <u>effectuate accumulative "evidences."</u> Along the way, "<u>paper trails</u>" will be established to <u>justify the outcomes.</u></p>	<p>1. Each partial contribution is <u>recorded</u> faithfully and will have tangible results both numerically and spatially. In other words, they are <u>explicitly examinable</u>. 2. The paper trail itself, along with the final summation of results, is also explicitly examinable - in the form of maps, images, tables, graphs and other formats.</p>

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			<p>1. All data from this course are derived from the real world, e.g. Census Data, local data from the City of College Station. 2. All learning modules and the required final projects are about <u>solving real world problems</u>, e.g. <u>assessment of damages from Hurricane Katrina</u> and <u>evaluation of Quality of Life of specific locales in the City of College Station</u>. Because of the real world context, students are able to relate more closely to the class stipulations.</p>	<p>1. Students may <u>compare results</u> of their work to the real world with realistic references, e.g. Katrina damages reported from USEPA or FEMA, or various Quality of Life perspectives from the City of College Station. 2. <u>Verifications by students' peers from the required presentations of their work</u>.</p>
125	REN444500	<p><input checked="" type="checkbox"/> Formulate good questions and/or identify problems(s) within the discipline <input checked="" type="checkbox"/> Examine, identify, and gather information regarding the questions(s) and/or problems. <input checked="" type="checkbox"/> Analyze, interpret, and present results <input checked="" type="checkbox"/> Formulate conclusions(s) and/or select the best solution with appropriate justification <input checked="" type="checkbox"/> Evaluate the worth and importance of those conclusion(s) – including their placement in a social, environmental and historical context, as appropriate. Exceptional</p>	<p>Multiple ways: (1) Through weekly lab exercises, the vast majority of them leading to different results from different students, e.g., satellite image classification for assessing forest or urban area. (2) class project; students <u>choose</u> their own research questions and <u>identify imagery to use and methods to process images to reach their conclusions</u> (3) class (lecture time) dialog and discussions, where students are encourage to <u>ask questions</u>, or work in groups to answer questions, <u>identify problems</u>, etc.</p>	<p>Lab reports, class project paper, homework assignments, quizzes, exams</p>
			<p>For weekly lab assignments, students <u>examine</u> satellite imagery and <u>identify</u> a suit of processing needs to <u>answer questions</u>; similarly, for the class project, students <u>identify</u> imagery <u>needs for answering questions</u> of their own choice</p>	<p>Completion of lab assignments and lab reports, final project report</p>
			<p>Through weekly requirements for lab reports and final class project</p>	<p>Lab reports and class project completion</p>

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			Through open-ended questions and <u>formulation of research hypothesis</u> for lab reports and especially the class project	<u>Appropriateness of research questions, contrast methods, soundness of results</u>
			Lab reports and class project, with project <u>oral presentation and written paper</u> . Remote Sensing image processing tasks <u>solve problems with environmental and societal context</u> , e.g., <u>urban growth, deforestation</u> , etc. Students often correlates findings with other reports, e..g, census data	Student <u>engage searching information, filter facts, and extract appropriate correlations</u> to their own results
54	WFSC403500	<input checked="" type="checkbox"/> Formulate good questions and/or identify problems(s) within the discipline <input checked="" type="checkbox"/> Examine, identify, and gather information regarding the questions(s) and/or problems. <input checked="" type="checkbox"/> Analyze, interpret, and present results <input checked="" type="checkbox"/> Formulate conclusions(s) and/or select the best solution with appropriate justification <input checked="" type="checkbox"/> Evaluate the worth and importance of those conclusion(s) – including their placement in a social, environmental and historical context, as appropriate. Exceptional	Students <u>practice critical analysis of research articles, essays, their own (each other's) writing, audio tapes of seminar speakers using standards of reasoning and scientific thought</u> through <u>writing assignments, in class small and large group discussions of their writing assignments, laboratory computer simulation model exercises and analysis of results</u>	<u>Written work and oral responses</u> are clear, precise, and well-reasoned ecological thinking, terms, and distinctions are used effectively
			Written homework, in <u>class discussion and evaluation of homework and lab exercises</u>	<u>Accurately state in writing</u> (perhaps also aloud), the <u>purpose, a key question posed, information provided, the conclusions, concepts used, the assumptions, implications that logically follow, and the point of view taken</u>

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			<p><u>Analysis of written papers, essays, reports of their own laboratory exercise results</u></p>	<p>Students can answer the following questions: <u>Is the question at issue clear and unbiased?</u> Does the expression of the question <u>do justice to the complexity of the matter at issue?</u> Is the writers <u>purpose clear?</u> Does the writer <u>cite relevant evidence, experiences, or other information essential to the issue?</u> Does the writer <u>clarify key concepts when necessary?</u> Does the writer <u>show a sensitivity to what they are assuming or taking for granted</u> (insofar as those assumptions might reasonably be questioned)? Does the writer <u>develop a definite line of reasoning, explaining well how they arrive at their conclusions?</u></p>
			<p><u>Written homework and in-class assignments, small group discussions, evaluation of laboratory simulation model results, essay exam questions</u></p>	<p>Do they <u>develop a definite line of reasoning, explaining well how they arrive at their conclusions?</u> Do they <u>show sensitivity to alternative points of view or lines of reasoning?</u> Do they <u>consider and respond to objections framed from other points of view?</u> Do they <u>show sensitivity to the implications and consequences of the position they have taken?</u></p>
			<p><u>Written homework and in class assignments, laboratory simulation model results and interpretation in reports, essay exam questions</u></p>	<p>Does the writer <u>show sensitivity to alternative points of view or lines of reasoning?</u> Do they <u>consider and respond to objections framed from other points of view?</u> Does the writer <u>show sensitivity to the implications and consequences of the position they have taken?</u></p>

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181	MKTG325501	<input checked="" type="checkbox"/> Formulate good questions and/or identify problems(s) within the discipline <input checked="" type="checkbox"/> Examine, identify, and gather information regarding the questions(s) and/or problems. <input checked="" type="checkbox"/> Analyze, interpret, and present results <input checked="" type="checkbox"/> Formulate conclusions(s) and/or select the best solution with appropriate justification <input checked="" type="checkbox"/> Evaluate the worth and importance of those conclusion(s) – including their placement in a social, environmental and historical context, as appropriate. Exceptional	<p>This course is project course centered around the Stanley Marcus Retailing Communications Competition. Basically, students are divided into groups. <u>Each group chooses a local retailer and conducts a retail audit on this company.</u> The retail audit includes: an <u>analysis</u> of the company's strengths, weaknesses, opportunities and threats; an analysis of the competition - both current and forecasted (including perceptions, competitive strategies and practices, sales, etc.); and <u>an analysis of the retailer's current positioning strategies.</u> The groups <u>design, collect, and analyze data</u> on consumer perceptions and current retail practices. <u>Data is collected using a variety of methods, including focus groups, personal interviews, mystery shopping activities, and surveys.</u> They <u>analyze their collected data and ultimately come up with a number of implementable, realistic recommendations for the retailer.</u> Students <u>compile this work and present it in both written and oral formats.</u> The written and oral papers are judged by myself and ultimately executives from Neiman Marcus a</p>	<p>The students receive grades on both their <u>written and oral presentations</u> of this project. They also have the opportunity to win \$, prizes, and a prestigious title with the Stanley Marcus Retail Communications Competition. Winners and finalists of this competition often put their achievement on their resumes and bring the papers to their interviews. This project is well respected among retail recruiters.</p>

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			<p>Students have to go out and <u>collect data</u> on their local retailer and its competition. They have to <u>decide what kind of information they are going to collect, how they are going to gather that information,</u> and ultimately, how they will <u>organize the information to analyze that information</u> in a timely manner. Their ultimate goal is to come up with realistic suggestions for improvement or future retail practices to help their retailer improve business.</p>	<p>Students have to <u>turn in their data collections procedures, methods, and analyses with their written paper.</u> Their research activities are evaluated as a part of their project grade. This research is also evaluated in the Competition.</p>
			<p>Students have to <u>analyze the data</u> they collect with this project. They have to turn in an analysis of all the data collected and <u>specifically state how their findings led them to their ultimate suggestions for the retailer.</u> Students <u>present their analyses in graphic and text format in both their written papers and oral presentations.</u></p>	<p>Students are graded on their <u>data analysis,</u> how well they <u>communicate their data analysis,</u> and how well they <u>integrate their findings into their recommendations</u> to the retailer. Students are graded on how well they <u>analyze, interpret and present their findings in both their written projects and oral presentations.</u></p>
			<p>With these projects, students <u>use their retail audits</u> to come up with <u>recommendations</u> for retailers. These recommendations have to be <u>based on the information they collected from their data collection procedures.</u> The entire project leads up to the <u>final recommendations</u> these students give their retailers.</p>	<p>The students' recommendations are graded on how well they <u>formulated their conclusions...did they proved the best recommendation with appropriate justification.</u></p>

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			<p>Students have to come up with <u>recommendations that are realistic</u>. They have to come up with <u>suggestions that the retailer could and would actually implement</u>. Their <u>recommendations must fit within the social environment of the retailer and its customers, fit within the current resources and legal practices of the environment, and match the positioning of the retailer (historical context)</u>. Students are encouraged to come up with a few, <u>quality recommendations</u>, not a long list of bulleted ideas for improvement. In fact, these students have to <u>forecast the costs and benefits of each of their recommendations</u>.</p>	<p>The worth and importance of the students' recommendations play a heavy role in determining the winner of the Stanley Marcus Retailing Communications Competition. The executives judging this competition place great value on the worth and importance of recommendations given.</p>
202	ATMO352	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Formulate good questions and/or identify problems(s) within the discipline <input checked="" type="checkbox"/> Examine, identify, and gather information regarding the questions(s) and/or problems. <input checked="" type="checkbox"/> Analyze, interpret, and present results <input checked="" type="checkbox"/> Formulate conclusions(s) and/or select the best solution with appropriate justification <input checked="" type="checkbox"/> Evaluate the worth and importance of those conclusion(s) – including their placement in a social, environmental and historical context, as appropriate. <p>Exceptional</p>	<p>In lab and lecture, students are asked to <u>consider complex forecasting processes and tasks and to discuss problems and issues</u>. The goal is for the class to <u>identify hidden issues and problems, to discuss root causes of complexity, and on occasion suggest novel approaches to solving them</u>.</p>	<p>Gauge ability of students to <u>identify key points of failure in a forecast process and to formulate questions and problems based on those points</u>.</p>

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			<p>We often evaluate various forecasting techniques in lab using real-time and archived case studies, discuss forecasting successes and failures, and make suggestions regarding improvements. This requires students to gather, organize, and analyze data.</p>	<p>Student groups are evaluated on their ability to gather the appropriate data and organize it in a fashion that is conducive to analysis and interpretation.</p>
			<p>Forecasting mesoscale severe weather requires the analysis of a variety of observational and model output data. Students must analyze and interpret these data based on forecasting techniques grounded in physics that are presented in lab and lecture.</p>	<p>Student groups are asked to conduct real time forecasts of severe weather using weather data available on the internet and with custom data/software. The students must write a weather discussion that justifies their forecast based on the analysis and interpretation of the data that they have gathered. This discussion is evaluated based on the use of relevant information, sound physical reasoning, and completeness.</p>
			<p>From complex and varied data sources, students must analyze the data using a variety of complex forecast techniques and then make a forecast of a specific severe weather event over some region. The student groups must write a discussion each week explaining and justifying their severe weather forecast. Once or twice per semester, each group must present their forecast solution and justification orally to the entire class using computer graphics (i.e., weather discussion).</p>	<p>Each week group forecast discussions (both written and oral) are evaluated for content, reasoning, and completeness for each forecasting scenario. Forecasts are also benchmarked against what weather really occurred using objective skill scores. Using the skill scores, forecast groups compete against each other, their professor, and a national forecasting center for extra credit on their lab grade.</p>

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			<p>As part of the weather discussion and forecasting exercise, the forecasting groups discuss the damage and casualties caused by severe weather from the prior day or forecasting event. Student groups discuss successes and failures and their potential impact on society.</p>	<p>Are the student able to <u>assess the worth and importance of a correct forecast using severe storm reports</u>. Can students <u>identify various sorts of forecast failures</u> (e.g., miss - severe weather occurs but no warning was given; false alarm - severe weather was forecasted but no weather occurred) and evaluate the impact to society. Can students <u>identify</u> how these implications influence the forecast process?</p>
128	stat407500	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Formulate good questions and/or identify problems(s) within the discipline <input checked="" type="checkbox"/> Examine, identify, and gather information regarding the questions(s) and/or problems. <input checked="" type="checkbox"/> Analyze, interpret, and present results <input checked="" type="checkbox"/> Formulate conclusions(s) and/or select the best solution with appropriate justification <input checked="" type="checkbox"/> Evaluate the worth and importance of those conclusion(s) – including their placement in a social, environmental and historical context, as appropriate. <p>Exceptional</p>	<p>I give each student an academic paper <u>examining a particular question using a publicly available dataset</u>. ideally, one should be able to <u>recreate the results of the researcher</u>, but that is rarely the case for a variety of reasons. so once we have looked at what the researchers did, we <u>look at better ways to use the data to answer the question more rigorously</u>.</p>	<p>Ability to <u>move through this process self-sufficiently</u>. that's why they have <u>3 projects - first 2 smaller so they can get the hang of it</u>, but the hope is for <u>the third they can be more independent of me</u>. also, the <u>quality and quantity of their own attempts to study the questions</u>.</p>
			<p>By <u>reading and understanding the academic paper</u> and <u>trying to relate that to the publicly available dataset</u> which the author is talking about. that sounds easy, but it can be quite difficult even with a well written paper.</p>	<p>Can <u>get the point</u> of the paper and <u>find the relevant pieces of the dataset independently</u>.</p>

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			Developing their own model and being able to <u>interpret the results</u> . and by interpret I mean be able to <u>produce graphs which visualize the results and show what they mean</u> .	Being able to <u>realize what graphs best show what is going on</u> . this is quite difficult. I usually have to help with this.
			Being able to <u>explain their results in a meaningful way</u> . I have them do <u>verbal presentations</u> so they have the opportunity to <u>explain</u> in words <u>the way they approached the problem, built a model and interpret the results</u>	Being able to explain what they did well.
			The papers I pick for them to work on are on issues that have undeniable importance eg. <u>global warming</u> , <u>health issues</u> like <u>obesity</u> , social issues like <u>homelessness</u> and <u>crime</u> . so it is not hard for them to see the relevance of their work.	<u>Understanding the implications of the results</u> and being able to <u>explain that to the rest of the class</u>
214	ANTH351500	<input checked="" type="checkbox"/> Formulate good questions and/or identify problems(s) within the discipline <input checked="" type="checkbox"/> Examine, identify, and gather information regarding the questions(s) and/or problems. <input checked="" type="checkbox"/> Analyze, interpret, and present results <input checked="" type="checkbox"/> Formulate conclusions(s) and/or select the best solution with appropriate justification <input checked="" type="checkbox"/> Evaluate the worth and importance of those conclusion(s) – including their placement in a social, environmental and historical context, as appropriate. Exceptional	By <u>evaluating a series of ancient archaeological "monuments" in terms of various theoretical models current in the field</u> . Each student would be assigned one ancient site (Pompeii, Masada, Athens) or one ancient monument (the Venus de Milo, the Parthenon, the Mausoleum at Halicarnassus) and asked to <u>interpret it in terms of a number of archaeological philosophies</u> (New Archaeology, Annalist school, feminist archaeology, etc.)	Familiarity with the tenets of various theoretical approaches, and a willingness to <u>think "outside" the bounds of the more traditional, art-historical approach to classical antiquity</u> .

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			By <u>conducting fundamental research</u> on well-known ancient monuments their cultural context(s), <u>finding parallels</u> , and <u>gaining the tools to work with various Greek and Latin historical documents</u> , all of which are widely available in translation.	<u>Familiarity with standard reference works and research tools, well-organized student presentations, well-written synopses.</u>
			Students will have the opportunity to <u>consider in-depth</u> some of the great icons of the Classical Greek and Roman world, and <u>evaluate</u> them from a variety of perspectives.	I would like students to <u>share their work</u> with fellow classmates, <u>through oral presentations and communal evaluation of their research findings.</u>
			By giving them the opportunity to <u>become familiar with</u> a host of <u>theoretical approaches</u> to archaeology that are rarely considered in introductory survey courses.	Completion of reading assignments, participation in <u>group discussions</u> , <u>understanding</u> of the <u>key tenets</u> of these approaches and their <u>impact on the field</u> at large.
			I expect that this course will demonstrate not only the wide range of approaches to (and problems in) "reading" a work of art or monument such as the Colosseum, but also give them a sense of the extent to which such <u>theoretical filters</u> have influenced whole genres or <u>schools of archaeological research</u> .	A willingness and ability to <u>consider/appreciate the larger historical and cultural origin/impact of a series of theoretical models.</u>

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10	ENGL481500	<input checked="" type="checkbox"/> Formulate good questions and/or identify problems(s) within the discipline <input checked="" type="checkbox"/> Examine, identify, and gather information regarding the questions(s) and/or problems. <input checked="" type="checkbox"/> Analyze, interpret, and present results <input checked="" type="checkbox"/> Formulate conclusions(s) and/or select the best solution with appropriate justification <input checked="" type="checkbox"/> Evaluate the worth and importance of those conclusion(s) – including their placement in a social, environmental and historical context, as appropriate. Exceptional	<p>Students are presented with current interpretations of literary and historical texts; they then read primary source materials and <u>evaluate how well current models are successful in answering questions about the literature or historical document</u></p>	<p>Successful formulation of thesis <u>combining existing model with an assessment of their strengths and weaknesses when interpreting early modern materials resulting in a convincing essay that uses new applications of primary materials to support its thesis</u></p>
			<p>Based on their analysis of the strengths and weaknesses of current models for the interpretation of early modern women's lives and writings, they then begin to <u>compile a collection of primary and secondary texts which may be used to interrogate the model and to propose an alternative interpretation</u></p>	<p>The creation of a thorough working bibliography of primary and secondary texts which will form the base of the long seminar essay</p>
			<p>To write the long seminar essay successfully, the students first <u>create a proposal outlining the issues, questions, and sources that they will be working with;</u> this document is the starting point of the <u>extended analysis of the identified areas of question</u></p>	<p>A convincing proposal which <u>clearly identifies the significant issues raised by the documents and lays out the anticipated course of analysis</u></p>

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			<p>The long seminar essay, which has built upon all the smaller inquiries, requires the student to <u>come to a clear conclusion based on the evidence gathered and the application of a clear system of analysis</u></p>	<p>The successful seminar paper is <u>given in class as a presentation, critiqued by the seminar participants</u>, and exists as a <u>substantial essay</u> suitable for use as a writing sample for graduate school applications, etc. It should have a clear thesis, convincing evidence, and a strong conclusion which emphasizes the significance of the conclusion to the field in general</p>
			<p>The seminar paper is not simply a collection of existing interpretations of a historical or literary period but instead an <u>evaluation of the existing interpretative models and a recovery of early modern primary materials</u>. Given that current social practices and government policies often are premised on a notion of "how things always were in the past," students learn how crucial it is to <u>understand "how" they know information about past cultures and to interrogate models which are made use of in shaping the present</u></p>	<p>A successful seminar paper not only looks at <u>recovering knowledge</u> about the past, but also about <u>how we view the past through its literature and texts and they ways in which these understandings of past cultures affect the perception of present day issues</u></p>

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			<u>Students collect data from the states to test their hypotheses.</u>	Data are necessary elements of course assignments.
			<u>Students use quantitative analysis to test their hypotheses.</u>	<u>Correct use of bivariate and multivariate regression analysis and correct interpretation of results.</u>
			<u>In each of five short papers, students must conclude whether hypotheses were disconfirmed or failed to be disconfirmed.</u>	<u>Correct conclusion based on interpretation of direction and strength of measures of association.</u>
			<u>The popular idea that states are laboratories of democracy is based on the idea that we can compare the states. After identifying which states are more and less successful, the question becomes what factors cause greater and lesser success. In addition, students must ask whether the conclusions of research conducted in the 20th century also apply to patterns of state differences in the 21st century.</u>	<u>Articulation of interesting hypotheses. Identification of appropriate operational measures of concepts. Collection of valid and reliable data. Using data correctly in bivariate and multivariate regression models. Articulating criteria for rejecting hypotheses. Applying criteria correctly and correctly interpreting the results of data analyses.</u>

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18	POLS424500	<input checked="" type="checkbox"/> Formulate good questions and/or identify problems(s) within the discipline <input checked="" type="checkbox"/> Examine, identify, and gather information regarding the questions(s) and/or problems. <input checked="" type="checkbox"/> Analyze, interpret, and present results <input checked="" type="checkbox"/> Formulate conclusions(s) and/or select the best solution with appropriate justification <input checked="" type="checkbox"/> Evaluate the worth and importance of those conclusion(s) – including their placement in a social, environmental and historical context, as appropriate. Exceptional	A major requirement of this course is an original research paper in which students <u>devise a testable hypothesis</u> about how electoral institutions affect some aspect of political behavior.	Students must <u>turn in a paper proposal that includes their hypothesis</u> for their paper. Next they <u>research the paper, gathering literature on topics related to the hypothesis, gather data to test the hypothesis, and present their results.</u> Success is a paper that presents a hypothesis, grounds it in the literature, collects appropriate data to test the hypothesis and discusses the findings. Success <u>does not require finding support for the hypothesis.</u>
			As part of the major research paper described in the previous question, students must <u>construct a literature review explaining how their hypothesis relates to the literature</u> (building on literature presented in the course). They should also <u>reference this literature when explaining why they selected certain measures for testing their hypothesis.</u> For a second, team paper, that <u>makes proposals for a constitution for a country, they again must pull together literature on institutions</u> (i.e., literature about particular institutions, and also about how institutions are expected to interact).	Success if the independent paper is (1) <u>showing the ability to situate their hypothesis in the literature,</u> and (2) <u>utilizing the existing literature to explain why they decided to test their hypothesis in the way they did.</u> For the team paper, <u>success is making use of literature</u> (much of which is theoretical) to apply to the specific conditions of the country for which they are designing a constitution.

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			<p>For the major research paper assigned in the course, <u>student must not only develop a testable hypothesis, but also collect data to conduct at least a preliminary test of their hypothesis. They must collect data from at least 2 cases, which typically means at least 2 countries. In their paper they present the results of their hypothesis test, and also discuss what the findings mean for their hypothesis and possible additional factors to consider in future research.</u></p>	<p>Success is defined as meeting all the components of this assignment: (1) <u>designing their own hypothesis</u>, (2) <u>placing their hypothesis in the context of the literature</u>), (3) <u>collecting data from at least 2 cases</u> appropriate for testing their hypothesis in those cases, (4) <u>discussing what their findings indicate for their hypothesis</u>, and (5) discussing possible avenues for future research (e.g., additional variables that they now think should be added to the analysis, <u>ways the hypothesis might need to be modified</u>, etc.)</p>
			<p>My course does not overtly ask students to "select the best solution" to a problem. However, in the first research paper, they are expected to <u>draw conclusions about what the evidence they found indicates about their hypothesis. In the team paper the essence of the assignment is to propose institutions of government for a country (e.g., electoral rules, design for the executive, legislature, etc.) and to assess the pros and cons of these institutions given the context of the country and how institutions are likely to interact. Thus, the team project does require students to consider different possibly institutions and to justify the institutions they selected given the context of the country.</u></p>	<p>Success is defined as <u>learning to base an argument in scientific literature, rather than simply on personal experience -- to use the scholarly literature as a basis for</u> (1) <u>developing a hypothesis, applying a hypothesis to new cases, modifying an hypothesis</u>; and (2) <u>assessing the likely impact (both positive and negative) of a political institution in a particular type of context.</u></p>

Rec#	College and Course #	Inquiry-rich Competencies	Teaching Engagement Strategy	Indicators of Student Success
			<p>In the first paper one of the things I urge students <u>to consider is the importance of temporal context, or country context for their hypothesis.</u> Consider of this context should be part of their conclusion discussion about what the evidence they find indicates about their hypothesis. In the team paper in which they design a constitution for a country, part of the purpose of this project is to get students to <u>assess how specific types of political institutions (e.g., electoral laws) are likely to operate in different types of social and historical contexts.</u></p>	<p>Success in paper 1 involves consideration of <u>how time and place (different types of countries, different time periods) are likely to affect the generalizability of a theory in the literature, or of their hypothesis.</u> Success in the team paper involves consideration <u>how the institutions they propose are likely to function given the specific social, environmental and historical context of the country for which they are designing the institution -- consideration of the generalizability of scholarly literature about institutions to different types of countries.</u></p>
293	ENGR111501	<p><input checked="" type="checkbox"/> Formulate good questions and/or identify problems(s) within the discipline <input checked="" type="checkbox"/> Examine, identify, and gather information regarding the questions(s) and/or problems. <input checked="" type="checkbox"/> Analyze, interpret, and present results <input checked="" type="checkbox"/> Formulate conclusions(s) and/or select the best solution with appropriate justification <input checked="" type="checkbox"/> Evaluate the worth and importance of those conclusion(s) – including their placement in a social, environmental and historical context, as appropriate. Exceptional</p>	<p>1. The class is divided into two projects each composed of <u>designing an artifact to address a societal need, predicting its behavior using math and physics and then demonstrating this prediction is indeed borne out.</u> 2. The classroom interaction is directed towards allowing the student to <u>discover how to predict the performance of their device through a series of questions that address a variety of needs.</u></p>	<p>1. The student <u>teams</u> have to <u>demonstrate, by quantitative means (in a predictive fashion and not by trial and error) that their embodiment satisfies the design specifications.</u> These form the bulk of the homework in the class, with each module addressing a different aspect of the design.</p>

Rec#	College and Course #	Inquiry-rich Competencies	Teaching Engagement Strategy	Indicators of Student Success
			<p>1. The students have to <u>devise methods to find the breaking strength and other material properties of the elements that they use to design their artifact</u>. They then have to <u>carry out these experiments</u> (in the physics lab for the clustered sections) and <u>arrive at the measure of these material properties that are then use for their performance prediction</u>.</p>	<p>The students are judged on the <u>success of their physics experiments</u>.</p>
			<p>1. The students have to <u>compare their performance predictions with the actual performance of their artifact</u>. <u>If the two do not match</u> (within a preset bound) they are asked to <u>re-examine their testing procedure as well as their calculations</u>. This is done by using two class periods for the final project demonstration. <u>The first trial is called a project dry run allows the students to recover from errors in design and/or calculations</u>. They have to then <u>come back next class and redo the demo and show that their design is successful</u>.</p> <p>2. Students have to <u>present their interim findings in a series of structured technical memos</u>. Each student in a team is responsible for <u>producing one such memo</u>.</p>	<p>1. <u>Successful completion of the project demonstration at the end of class 2</u>. 2. The memos are graded according to a <u>grading rubric that is shared with the students</u> and the results are used as part of the homework grade.</p>

Rec#	College and Course #	Inquiry-rich Competencies	Teaching Engagement Strategy	Indicators of Student Success
			<p>The students have to <u>build an artifact that satisfies the stated need</u>. The students have to <u>arrive at four possible designs and explain how their design satisfies the needs and constraints</u>. They are then asked to <u>combine these solutions and arrive at the best solution</u>.</p>	<p><u>Guidelines are provided as to the determination of how well the best design addresses the design specifications and the project grade is determined partly by how well the design meets the design requirements</u>.</p>
			<p>The critical element of the project chosen is that it <u>should have a demonstrable societal impact</u>. For example in ENGR 111, the projects chosen are to <u>build a model of a pedestrian bridge across Bizzell Street and associate this with the university's master plan</u>. The <u>second project is to build a model wheel chair lift for a car using a Lego mindstorms system complete with speed restrictions and safety assessment</u>. Finally, in ENGR 112, the students are asked to <u>build and guarantee the performance of a vibration isolation system for a building</u>. This is connected up with a discussion of <u>disaster prone areas of the world and historical effects of such catastrophes</u>.</p>	<p>The designs that the students build are evaluated for their <u>safety features</u> as well as their <u>performance</u>. They are also <u>evaluated on the basis of assembly cost</u>.</p>

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264	AERO401501	<input checked="" type="checkbox"/> Formulate good questions and/or identify problems(s) within the discipline <input checked="" type="checkbox"/> Examine, identify, and gather information regarding the questions(s) and/or problems. <input checked="" type="checkbox"/> Analyze, interpret, and present results <input checked="" type="checkbox"/> Formulate conclusions(s) and/or select the best solution with appropriate justification <input checked="" type="checkbox"/> Evaluate the worth and importance of those conclusion(s) – including their placement in a social, environmental and historical context, as appropriate. Exceptional	<u>Analyze and interpret customer requirements for a flight vehicle, size a flight vehicle to satisfy performance constraints, and determine suitable configurations for a specified mission</u> <u>Work successfully as a member of a team, conduct and document a detailed and complete preliminary design of a flight vehicle</u> <u>Understand the system relationships and interactions between aerodynamics, structures and materials, dynamics and control, propulsion, performance, and internal systems on the design of a flight vehicle</u> <u>Recognize the role of civil and military regulations and the importance of considering safety, reliability, and maintenance considerations in flight vehicle design</u> <u>Technical reports, Preliminary Design Review presentations, Critical Design Review presentation, Team evaluation</u>	<u>Students are able to successfully design and conduct experiments, as well as analyze and interpret data; as evidenced by their final design report(s), presentations, and acceptance by the peer Critical Design Review Team.</u>
			No Data	No Data

Rec#	College and Course #	Inquiry-rich Competencies	Teaching Engagement Strategy	Indicators of Student Success
			<p><u>Working successfully as a member of a team, conduct and document a detailed and complete preliminary design of a flight vehicle</u></p> <p><u>Understand the system relationships and interactions between aerodynamics, structures, materials, controls, etc. requirements.</u></p> <p><u>Communicate design results in technical reports, briefings, and presentations</u></p> <p><u>Team evaluation, Technical reports, Preliminary Design Review presentations, Critical Design Review presentation, outside reviews</u></p>	<p><u>Evaluation of technical reports, briefings, and presentations.</u></p> <p><u>Evaluation and acceptance by peer Critical Design Review team.</u></p>

Rec#	College and Course #	Inquiry-rich Competencies	Teaching Engagement Strategy	Indicators of Student Success
			<p>Analyze and interpret customer requirements for a flight vehicle, size a flight vehicle to satisfy performance constraints, and determine suitable configurations for a specified mission</p> <p>Work successfully as a member of a team, conduct and document a detailed and complete preliminary design of a flight vehicle</p> <p>Understand the system relationships and interactions between aerodynamics, structures and materials, dynamics and control, propulsion, performance, and internal systems on the design of a flight vehicle</p> <p>Recognize the role of civil and military regulations and the importance of considering safety, reliability, and maintenance considerations in flight vehicle design</p> <p>Technical reports, Preliminary Design Review presentations, Critical Design Review presentation, Team evaluation</p>	<p>Successful completion of Technical reports, Preliminary Design Review presentations, Critical Design Review presentation, Team evaluation.</p> <p>Acceptance of design by faculty and peer Critical Design Review Team.</p>
			<p>Students must demonstrate an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.</p>	<p>Successful design as judged by faculty and peer Critical Design Review Team.</p>

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303	INEN459501	<input checked="" type="checkbox"/> Formulate good questions and/or identify problems(s) within the discipline <input checked="" type="checkbox"/> Examine, identify, and gather information regarding the questions(s) and/or problems. <input checked="" type="checkbox"/> Analyze, interpret, and present results <input checked="" type="checkbox"/> Formulate conclusions(s) and/or select the best solution with appropriate justification <input checked="" type="checkbox"/> Evaluate the worth and importance of those conclusion(s) – including their placement in a social, environmental and historical context, as appropriate. Exceptional	<p>Outcome Definition: Students are able to <u>recognize opportunities for applying industrial engineering tools to improve operational aspects of complex production, distribution, and service systems.</u> They can <u>define and formulate the important elements of an industrial engineering problem in a concrete, quantitative language of engineering and mathematics.</u> Furthermore, students are able to <u>apply engineering, statistical, and mathematical methods to analyze the problem formulations and develop appropriate solutions that improve the operation of the system.</u></p> <p>Course Experience: A large component of the design project is <u>understanding the critical issues about the problem, extract the relevant problem, and determining how to setup and solve this problem.</u> Often, the industry contact describes the problem from their own business perspectives and jargons. The group has to <u>identify the underlying problem, formulate the problem, and develop strategies to solve the problem.</u></p>	<p>Indicators of student success: <u>Well documented project proposal, design review, website, final report and presentation.</u></p>

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			<p>Outcome Definition: Students are able to <u>conduct a statistical study of a given situation</u>. They should be able to <u>define the problem, determine the constraints, design the experiment, collect data, perform required analysis and interpret the results</u>. They should be able to <u>apply the fundamental principles of experimental design: replication, randomization and local control – each principle playing an important role in the development of a significance test</u>. Students should be able to <u>determine variation caused by random variation and a systemic effect</u>.</p> <p>Course Experience: The students have to <u>identify the data requirements and methods for data gathering</u>. They have to <u>perform analysis of the measured data for accuracy and relevance, and determine how to use the data and develop strategies while dealing with missing data</u>. Depending on the project requirements, they have to <u>design and conduct experiments and perform sensitivity analysis to test their solutions</u>.</p>	<p><u>Well documented design review, final report, presentation.</u></p>

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			<p>Outcome Definition: Students are able to <u>recognize opportunities for applying industrial engineering tools to improve operational aspects of complex production, distribution, and service systems.</u> They can <u>define and formulate the important elements of an industrial engineering problem in a concrete, quantitative language of engineering and mathematics.</u> Furthermore, students are able to <u>apply engineering, statistical, and mathematical methods to analyze the problem formulations and develop appropriate solutions that improve the operation of the system.</u></p> <p>Course Experience: A large component of the design project is <u>understanding the critical issues about the problem, extract the relevant problem, and determining how to setup and solve this problem.</u> Often, the industry contact describes the problem from their own business perspectives and jargons. The group has to <u>identify the underlying problem, formulate the problem, and develop strategies to solve the problem.</u></p> <p><u>This course provides a rich experience for th</u></p>	<p>Indicators of student success: <u>Well documented project proposal, design review, website, final report and presentation.</u></p>

Rec#	College and Course #	Inquiry-rich Competencies	Teaching Engagement Strategy	Indicators of Student Success
			<p>A large component of the design project is <u>understanding the critical issues about the problem, extract the relevant problem, and determining how to setup and solve this problem.</u> Often, the industry contact describes the problem from their own business perspectives and jargons. The group has to <u>identify the underlying problem, formulate the problem, and develop strategies to solve the problem.</u></p>	<p><u>Well documented project proposal, design review, website, final report and presentation.</u></p>

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			<p>Outcome Definition: Students are able to <u>integrate different types of knowledge and skills to design a system or a process consisting of multiple components working together as a whole. Students have an appreciation for the design process including the blend of analysis and creativity, the requirement for satisfying multiple, perhaps conflicting objectives, the trait of lacking a single correct answer, and the need for an iterative type approach.</u></p> <p>Course Experience: The steps of the scientific method can be reformulated as follows when we consider specifically the engineering design process: <u>(1) define the problem; (2) analyze the problem; (3) generate alternative designs; (4) evaluate the alternatives; (5) select the preferred design; and (6) implement the design.</u> The six steps of the engineering design process recast into the following process for conducting the capstone design project:</p> <ul style="list-style-type: none"> • <u>Define the objective of the project</u> • <u>Specify primary and support activities to be performed</u> • <u>Determine the intera</u> 	<p><u>Well documented project proposal, design review, notebooks, final report and presentation.</u></p>

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298	MEEN401501	<input checked="" type="checkbox"/> Formulate good questions and/or identify problems(s) within the discipline <input checked="" type="checkbox"/> Examine, identify, and gather information regarding the questions(s) and/or problems. <input checked="" type="checkbox"/> Analyze, interpret, and present results <input checked="" type="checkbox"/> Formulate conclusions(s) and/or select the best solution with appropriate justification <input checked="" type="checkbox"/> Evaluate the worth and importance of those conclusion(s) – including their placement in a social, environmental and historical context, as appropriate. Exceptional	1. Students <u>work in teams and begin with open-ended statement by outside sponsor</u> 2. <u>Analyze need</u> 3. <u>Functionally decompose problem</u> 4. <u>Determine conceptual design</u> that satisfies functions 5. <u>Select for refinement best design that meets criteria</u>	1. Students <u>demonstrate each item to left in studio</u> with critique from instructor. 2. <u>Outside sponsors</u> (practicing engineers) <u>visit A&M to provide reviews</u> about two times per semester.
			1. Students in studio and outside class <u>follow design process taught in lecture</u> . 2. Students <u>closely observe other students proceeding along the design path on different projects</u> .	1. Students <u>demonstrate each item to left in studio</u> with critique from instructor. 2. <u>Outside sponsors</u> (practicing engineers) <u>visit A&M to provide reviews</u> about two times per semester.
			1. Students <u>design complex systems</u> . 2. Students <u>design special-purpose parts and assemblies to support to support systems</u> . 3. Students <u>present conceptual data</u> . 4. Students <u>present final design</u> .	1. <u>Successful completion and communication by report and formal presentation of design that fulfills the intended purpose within constraints of time, cost, and selected physical parameters</u> . 2. Students <u>submit reports (including drawings)</u> 3. Students <u>make important final design presentation to outside design sponsors</u> .

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			1. Each design team designs several <u>concepts</u> , and learns methodology to select <u>best solution</u> .	1. Students <u>arrive</u> at a number of suitable concepts and are able to <u>winnow out less suitable solutions</u> to arrive at best one. 2. Students are able to <u>present acceptable solution</u> to instructors and outside design sponsors.
			1. <u>Designs are required to meet economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability constraints.</u> 2. <u>Off-design (emergency) operation requirements are seriously considered to have minimum impact on matters of public concern.</u>	1. <u>Successful completion and communication by report and formal presentation of design that fulfills the intended purpose without deleterious impacts on economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability aspects.</u>
Galveston				
91	Eng140-406,413	<input checked="" type="checkbox"/> Formulate good questions and/or identify problems(s) within the discipline <input checked="" type="checkbox"/> Examine, identify, and gather information regarding the questions(s) and/or problems. <input checked="" type="checkbox"/> Analyze, interpret, and present results <input checked="" type="checkbox"/> Formulate conclusions(s) and/or select the best solution with appropriate justification <input checked="" type="checkbox"/> Evaluate the worth and importance of those conclusion(s) – including their placement in a social, environmental and historical context, as appropriate. Exceptional	Students <u>examine family/cultural/media influences over racial and gender self-definition as they examine identity, values, and goals in their lives.</u> By examining the efforts of other, they begin to <u>get some perspective on themselves.</u> Finally, by <u>creating a portfolio of their conclusions in writing,</u> they gain some insight into the limitations of their own experiences.	Essays for each topic give students an opportunity to <u>articulate their understandings.</u> A <u>final research paper, which takes the form of an Investigative Report</u> gives them opportunities for both <u>primary and secondary research.</u>

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			<p>Each assignment must speak to a <u>defined audience</u>, from letter to <u>Investigative report</u>, they must speak to a broader audience. <u>Rubrics modeling each task are provided and taught</u></p>	<p>Each written assignment requires <u>feedback</u>, using the rubric as the model, from partner, team, and teacher. Assessment forms, using the rubric as a guideline, are provided for those who provide feedback to the writer.</p>
			<p>The <u>Investigative Report</u>, modeled after the <u>required research paper</u> expected in this course provide ample opportunity for the student to <u>demonstrate his/her ability to accomplish this</u>. <u>Peer</u> and teacher review, and the opportunity to <u>revise ones work</u>, encourages critical thinking.</p>	<p><u>Rubrics with benchmarks</u> based on <u>important elements</u> of a <u>good design</u> for each assignment <u>provide guidance</u> and the <u>bases for assessment by peers</u> and instructor.</p>
			NA	NA
			<p>Topics deal with real issues in their lives and offers them a chance to <u>articulate their feelings</u> about them, and to <u>understand better the perspectives of classmates</u>.</p>	<p>The level of engagement produces a better quality piece of writing, reflecting <u>greater insight and self-perception</u>.</p>

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121	mars430900	<input checked="" type="checkbox"/> Formulate good questions and/or identify problems(s) within the discipline <input checked="" type="checkbox"/> Examine, identify, and gather information regarding the questions(s) and/or problems. <input checked="" type="checkbox"/> Analyze, interpret, and present results <input checked="" type="checkbox"/> Formulate conclusions(s) and/or select the best solution with appropriate justification <input checked="" type="checkbox"/> Evaluate the worth and importance of those conclusion(s) – including their placement in a social, environmental and historical context, as appropriate. Exceptional	<p>One example, students are asked to <u>identify a newspaper article published in the last 2 weeks (using lexis-Nexis) about some aspect of Marine Geology (the MARS430 course). This can be an article about volcanoes, earthquakes, sea-level rise, beach erosion, etc.</u> The student is then asked to <u>"role play" that they are a famous marine geologist of the past (discussed in the text book) and to write a one page letter to the editor to comment of the newspaper article.</u> This requires the student to <u>identify important marine geology topics being covered in the news, and to learn about the expertise/specialty of famous marine geologists (i.e. some are volcanologists, some sedimentologists, some paeoceanographers, etc).</u> Finally, the five students in each team then have to <u>role play that they are the editorial board of a major newspaper charged with choosing the one letter-to-the-editor that will be published.</u> They have to <u>argue about each of the five newspaper articles (i.e. which is more important) and about the five marine geologists (i.e. which is most qualified to con</u></p>	<p>Assignment is examined by the instructor to look for <u>identification of the "big issues"</u> (they are not told what topics to choose, and about the information they obtained about the marine geologist. Also, the group is <u>graded on the level of critique applied to the five letters and the reasoning used to choose the one that will be "published"</u>.</p>

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			<p>An example, each student is <u>given a bag of various colored/shaped beads</u>. They are also <u>given a list of "species names" in Latin that represent each colored or shaped bead</u>. Each "species" also has its <u>temperature tolerance range given</u>. They are asked to <u>calculate the ocean temperature at the time the species found in their sample was deposited on the seafloor</u> (this is known as a transfer function. The student first has to <u>sort the beads, then identify the name of each shaped/colored bead by the Latin names, but there are more "species" than found in any one bag (sample)</u>. They have to <u>work with their tem members (who have other samples) to identify all species</u>. Once the species have been identified and counted, they then have to <u>calculate the transfer function temperature</u>. Then have to <u>assemble all of the samples into a core sequence and then interpret what part of the world ocean the core (made up of the samples) was collected</u>. Finally, they then have to <u>compare this transfer function temperature with an isotopic temperature</u>. T</p>	<p>Does the group <u>get the temperatures right</u>, and then does the class <u>identify the correct part of the world the sample was collected?</u> Not an easy exercise.</p>
			See previous example	No Data

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			<p>An example, students are given a few basic facts (i.e. how many cubic km's of the Greenland Ice sheet melts per year, how much the ocean has warmed in the last 50 yrs, <u>what is the sea level rise curve for Galveston Island</u>. The students then need to <u>calculate how much sea level rise is due to melting ice, how much is due to thermal expansion, and how much is due to isostatic sea level rise/fall</u>. A <u>conclusion as to the relative importance of each factor is drawn, and then a prediction as to what Galveston Island will look like in the next 50yrs is made, with recommendations as to housing construction on the west end of the island</u>.</p>	<p>Do they <u>get the scale of the problem correct</u>, and do they <u>get the relative importance of each factor correct</u>? Also, do they <u>grasp the importance of the rate of change for development,etc/</u></p>
			See previous example	No Data

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200	MAST350401	<input checked="" type="checkbox"/> Formulate good questions and/or identify problems(s) within the discipline <input checked="" type="checkbox"/> Examine, identify, and gather information regarding the questions(s) and/or problems. <input checked="" type="checkbox"/> Analyze, interpret, and present results <input checked="" type="checkbox"/> Formulate conclusions(s) and/or select the best solution with appropriate justification <input checked="" type="checkbox"/> Evaluate the worth and importance of those conclusion(s) – including their placement in a social, environmental and historical context, as appropriate. Exceptional!	<p>This course covers the history of wooden ship construction, and each student is required to <u>write a research paper describing the construction of a ship from beginning to end</u>. To do so, they must <u>research not just the timbers and fastenings that go into building a vessel, but they must understand the cultural context of the ship, and to do so they must ask and answer a number of questions</u>. For example, <u>what is the time period? What is the level of technology and education of shipwrights at this time? What resources and tools are available? What is the prevailing economic system: slavery, extended family, or centralized government support</u>. By asking and answering these and other questions, students are able to <u>have a better understanding of the choices shipwrights made and why they made them when building ships</u>.</p>	<p>Students who ask and then <u>finding answers to the necessary questions at each stage</u> are able to <u>formulate and explain in detail a practical construction sequence for a given ship</u>. With most students it is easy to <u>see the amount of time, effort, research, and thought that goes into each step and most do a competent job</u>. There are others who <u>gain a true feel not only for the construction sequence but for the influence of society on shipwrights and their possible thought processes during the process</u>. One way this becomes obvious is that <u>I play the ship owner who is contracting to have a ship built. I always include minor errors in the contract in regard to size, tonnage or even the type of ship I request may not be practical</u>. Most of the middle to upper level students are able to <u>see the errors and propose corrections in the contract</u>. Occasionally, I get a student who <u>sees things that I have missed or accepted as fact throughout my career or sees a new method or pattern in the construction of their ship</u>. Even if these are not viable upon further study, the fact that they have</p>

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			<p>As previously mentioned, each student must <u>break their research project down into specific and detailed steps beginning with accepting the contract to delivery of a ship.</u></p>	<p>Any glaring omission of a step or steps indicate a lack of success. A student can't beginning by just listing the different types timber and metal fasteners that go into building a ship. They must <u>explain why pine and not oak is used.</u> How does the shipwright <u>choose not just the type of wood but what pieces from a tree make the best frames or hanging knees and why.</u> As a master shipwright <u>do they live near the forest and walk out and choose their timber from live stands of trees as in ancient Greece.</u> Or <u>do they live in societies like ancient Rome or 19th century America where the forests are too far away and master shipwrights must choose and buy timber floated down rivers from distant forests.</u> <u>What effect do these social conditions have on the process.</u> It is usually easy to see if a student has missed a step and a little more subjective in the quantity of detail for each step described</p>

Rec#	College and Course #	Inquiry-rich Competencies	Teaching Engagement Strategy	Indicators of Student Success
			<p>Understanding ship construction is difficult for most people. The standard shape of buildings is rectangular. Ships are one of the few curved structures, and students <u>must conceptualize this three dimensional curved structure and not only explain how to build it, primarily in their mind much like ancient shipwrights, but they also have to explain why they are making some decisions instead of others.</u></p>	<p>The student is able to <u>describe the construction of a vessel that will perform requested tasks within a specific cultural context.</u> For example, I requested that a student build me a ship to carry 600 amphorae within the cultural context of 550 B.C. Greece. The student <u>analyzed the requirements the cargo placed on the hull and took into account long term costs, such as repairs.</u> The student then <u>proposed that instead of building the standard laced construction that I should instead contract for the more expensive but newer method of pegged mortise-and-tenon construction.</u> He then went on to <u>explain how he would customize the standard form of construction to my needs.</u> I was able to judge his success by how well he <u>adapted the prevailing technology to my needs within the specific cultural context and if what he was proposing was a practical solution.</u></p>
			<p>A lot of times there is no "best" solution. What I try to explain to students is that in this field <u>there are many different solutions to the same problem, and the number of solutions can vary depending on the cultural context in which they are working.</u></p>	<p>The main indicator of success is that a student has been able to <u>describe a practical solution within the constraints that I have set.</u> Sometimes students go so far as to <u>point out my constraints are not practical and are able to find a new pattern.</u></p>

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			<p>Again, a point of the course is that a student must <u>design a solution to a problem with in the confines of a specific social, environmental, and historical context.</u> The project shows how well <u>they understand these contexts and can produce a practical vessel.</u></p>	<p>There are rarely right or wrong answers in their conclusions. What I evaluate them on is <u>their grasp of a process and their ability to adapt that process to specific needs and their ability to explain why they are making choices.</u> What I try to impress on my students at the beginning of this course is <u>not to worry about the conclusion. I am not concerned so much with the final results. At this level original conclusions are rare. What is important is not only that they learn how to do research, but they feel comfortable and enjoy it.</u> Once the process becomes second nature, <u>worthwhile conclusions will take care of themselves.</u></p>
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