

Extending TILT to the Whole Test

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Summary

This report proposes extending Transparency in Learning and Teaching (TILT) from individual assignments or questions to the level of an entire test or assessment module. A Whole-Test TILT document gives students, before the assessment, a clear statement of its purpose, the learning objectives being assessed, the skills they must demonstrate, the materials they should review, and the criteria that will be used to evaluate their work.

The purpose of this approach is straightforward: students should understand the structure and expectations of an assessment while they still have time to prepare. The document is not intended to provide answers or reduce academic standards. It is intended to make the design of the assessment visible and to direct student effort toward the knowledge and skills the course requires.

Three sample documents accompany this report. They show how the same framework can be used in Calculus I, Principles of Macroeconomics, and Western Civilization. The examples are not proposed as fixed templates. They illustrate a common structure that can be adapted to different disciplines and teaching styles.

Background

I first used the TILT framework with individual mathematics assignments. Each document identified the purpose of the work, the task, the relevant learning objectives, the skills required, and the criteria for success. This made expectations more explicit and helped students understand what complete and acceptable work should include.

The next step was to apply the same structure to an entire test. Most tests are not random collections of questions. They usually assess a connected group of concepts and skills within a chapter or module. A Whole-Test TILT document makes that connection explicit. It explains what the assessment is designed to measure and how the individual questions fit within the larger learning unit.

Timing is important. Information intended to guide preparation should be available before the assessment begins. When students first encounter a long explanatory document during a timed test, the document itself may compete with the work of solving problems, interpreting evidence, or constructing an argument. For that reason, the Whole-Test TILT document should normally be placed in the course module well in advance of the assessment.

Core Elements of a Whole-Test TILT Document

A Whole-Test TILT document can be brief, but it should normally include the following elements:

- **Purpose:** what the assessment is intended to measure and why the material matters within the course.

- Learning objectives and skills: the concepts, methods, forms of reasoning, or communication students must demonstrate.
- Alignment: reminder of how these skills connect to the overall course goals.
- Suggestion(s) about where/how the skills might apply in the students' lives beyond the context of the course.
- **Task:** what students will be asked to complete on the exam, and how they might prepare for it.
 - Preparation materials: assigned readings, notes, practice problems, lectures, or other resources students should review.
 - Learning activities: specific forms of preparation that may help students become ready for the assessment.
- **Criteria for success:** the standards used to evaluate accuracy, reasoning, completeness, organization, notation, evidence, graphs, or other discipline-specific requirements. Whenever possible, these criteria should refer students back to examples discussed in class so that they have seen what stronger, incomplete, and incorrect work look like in practice.

The framework is consistent, but the content remains disciplinary. A mathematics assessment may emphasize notation, complete solutions, and correct procedures. An economics assessment may require graphs and written economic reasoning. A history assessment may require evidence, chronology, comparison, and causal analysis.

Benefits for Students

The most immediate benefit is reduced uncertainty. Students do not have to guess which ideas are central, what forms of reasoning will be required, or what the instructor considers a complete response. They can prepare more deliberately and identify gaps in their understanding before the test.

The document also helps students see the assessment as a coherent unit. Individual questions are connected to a stated set of objectives and skills, and the skills statement can remind students how the assessment advances the larger goals of the course, builds on earlier work, and prepares them for what comes next. This can encourage preparation based on understanding and practice rather than prediction or short-term memorization.

Clear criteria can also reduce avoidable confusion after grading. Students know in advance whether the assessment requires only a final answer or also requires supporting work, explanation, evidence, notation, labels, or organization. The standards remain demanding, but they are no longer hidden.

Benefits for Faculty and Programs

Creating a Whole-Test TILT document requires the instructor to review the assessment as a designed instrument. The instructor must identify its purpose, connect the questions to course objectives, confirm that the required skills were taught, and state the standards that will be applied. This process can reveal gaps, unnecessary repetition, unclear expectations, or questions that do not align well with the stated objectives.

The framework can also support communication within a program. Instructors who teach different sections of the same course may use a common structure while retaining control over content, emphasis, grading, and instructional method. The result is not a common test, but a common language for explaining assessment design.

Written documentation may also be useful during curriculum review, outcomes assessment, or discussions of consistency across sections. It provides visible evidence of how an assessment is connected to course objectives

and how student work is evaluated. These are practical benefits, but they should remain secondary to the main educational purpose: helping students prepare for serious academic work with clear expectations.

Suggested Use

The Whole-Test TILT document should be introduced as part of the regular course structure. In an online course, it can be placed at the beginning of the relevant module. In a classroom course, it can be distributed with the unit plan or study materials. It should be available early enough for students to review it, ask questions, and use it to organize their preparation.

A practical implementation could begin with a limited pilot. Faculty could create documents for one or two major assessments, review student questions and performance, and revise the format based on experience. The framework should remain flexible. It should not require unnecessary length, standardized wording, or administrative approval of individual assessments.

Accompanying Examples

The examples below demonstrate the framework in three different courses:

- Calculus I: Applications of Differentiation I, including critical points, the Mean Value Theorem, Rolle's Theorem, and the First Derivative Test.
- Principles of Macroeconomics: demand, supply, and market equilibrium, including graphs, determinants, shifts, shortages, surpluses, and market failure.
- Western Civilization: Ancient Rome, including the Republic and Empire, political and social development, religion, wider connections, and the use of historical evidence.

The examples show that a common assessment structure can be used without erasing disciplinary differences. Each document identifies purpose, objectives, preparation, student activities, and criteria in terms appropriate to the subject.

Sources and Acknowledgments

The course-alignment language and disciplinary learning objectives in the three examples are based on the publicly available Virginia Community College System course objectives for MTH 263 Calculus I, HIS 101 Western Civilizations Pre-1600 CE, and ECO 201 Principles of Macroeconomics. The Calculus I preparation materials also refer to the open-access APEX Calculus textbook.

The disciplinary examples were constructed from the publicly available VCCS course objectives and do not reproduce or derive from any individual colleague's syllabus, test, examination, or unpublished course materials.

Conclusion

Whole-Test TILT is a practical extension of an existing transparency framework. It treats the assessment as a complete learning unit and makes its structure visible before students are asked to perform. Used carefully, it can improve preparation, clarify standards, and help faculty review the alignment between objectives, instruction, and assessment.

The proposal does not require common tests, lower standards, or reduced faculty judgment. It requires only that the purpose, expectations, and criteria of an assessment be stated clearly and provided at a useful time. The accompanying examples are offered as working models for discussion and further refinement.

Module: Applications of Differentiation I

Module 4 Intro:

In this module we will explore how to find critical points of a function, solve Mean Value and Rolle's Theorem problems, and how to use First Derivative Test to find extreme points of and intervals of increase/decrease of a function. Please review the learning objectives below, as you will be expected to demonstrate proficiency in these areas in the module assessment.

Purpose:

The purpose of this assessment is to evaluate your ability to use derivatives to investigate the behavior of functions. The concepts of critical points, intervals of increase and decrease, and the Mean Value Theorem provide the foundation for determining where functions attain important values and how they change over an interval. These skills align directly with the MTH 263 course objectives for Applications of Differentiation: calculating local and absolute extrema, applying Rolle's Theorem and the Mean Value Theorem, and finding critical points and intervals on which a function increases or decreases. They build on your earlier work with derivatives and differentiation rules and prepare you for the next module, where you will use first- and second-derivative information to analyze concavity, inflection points, and the overall shape of a graph.

Main Skills of the Module (VCCS Learning Objectives):

- Find critical points and determine intervals on which a function is increasing or decreasing.
- Apply the Mean Value Theorem to study properties of a function.
- Apply Rolle's Theorem to study properties of a function.
- Use the First Derivative Test to calculate local and absolute maximum and minimum values and to analyze intervals of increase and decrease.

Outside this course, these skills are useful when analyzing changes in cost, revenue, population, speed, temperature, or another measured quantity over time, especially when you need to identify turning points, compare rates of change, or determine whether a quantity is increasing or decreasing.

Task:

Complete Test 4: Applications of Differentiation I. The test will assess the learning objectives and skills identified in this document. To prepare, complete the learning tasks and review the materials listed below.

Preparation Materials and Tasks:

Textbook: *Apex Calculus*, Chapter 3 Graphical Behavior of Functions. Licensed to the public under Creative Commons Attribution-Noncommercial 4.0 International Public License.

3.1 Extreme Values # 6, 7, 15 – 20

3.2 The Mean Value Theorem # 5 – 10, 11 – 19

3.3 Increasing and Decreasing Functions # 14 – 23

Study: Written Lectures # 7, 8 in Canvas Modules.

Additional Learning Tasks:

- Read and study assigned textbook sections and Written Lectures.

- Read and study online tutorials.
- Complete suggested homework for all assigned textbook sections and Written Lectures.
- Contact instructor when needed (office visits, Zoom meetings, email).

Optional Instructional Videos:

Students who would like additional explanations of the topics in this module may search for instructional videos on [YouTube](#) website.

Enter the following topics in the YouTube search bar:

- Find Critical Numbers
- Intervals of Increase and Decrease of a Function
- Mean Value Theorem
- Rolle's Theorem
- Use First Derivative Test to Find Intervals of Increase and Decrease
- Use First Derivative Test to Find Minimum and Maximum points

Criteria for Success:

Use the sample solutions and class discussions as reference points for what complete, partially complete, and incorrect mathematical work look like. The following point ranges summarize those standards:

- **9–10 points:** Correct step-by-step solution; all steps clearly typed using standard mathematical notation; correct answer.
- **5–6 points:** Solution process is mainly correct but incomplete; some steps are missing; answer may or may not be correct.
- **0–2 points:** Solution is incorrect or most steps are missing; answer may or may not be correct.
- Partial credit is given at the discretion of the instructor only.

Module 4 Conclusion:

The material of Module 4 “Applications of Differentiation I” is an introduction to Module 5 “Applications of Differentiation II” which is about applications of differentiation to find new information about the behavior of functions such as Intervals Concavity, Inflection Points, Second Derivative Test, and other topics.

Whole-Test TILT Example: HIS 101 Western Civilization pre-1600

Module: Ancient Rome

Module Intro:

In this module, students will study the development of Ancient Rome from its early society through the Roman Republic, the Roman Empire, the spread of Christianity, and the eventual decline of Roman imperial power. Students will examine Roman political institutions, military expansion, social and cultural development, and Rome's influence on the wider world.

Purpose:

The purpose of this assessment is to evaluate your understanding of Ancient Rome as a major civilization in Western history. This assessment will measure your ability to explain the origins and development of Roman society, compare the Roman Republic and the Roman Empire, analyze major political, cultural, social, religious, and economic developments, and examine Rome's connections with the wider world.

Main Skills of the Module (VCCS Learning Objectives):

- Identify and explain the origins of Roman society.
- Compare and contrast the Roman Republic and the Roman Empire.
- Analyze the development and impact of Roman culture, economics, politics, society, technology, religion, and philosophy.
- Examine connections between Roman society and the rest of the world.
- Analyze historical sources and reach conclusions based on interpretations of primary and secondary resources.

These skills align with the HIS 101 course goals of explaining the development of Western civilization, evaluating political, economic, social, cultural, and religious forces, and interpreting complex primary and secondary sources. They build on skills used in earlier ancient-history modules and prepare you to examine how Roman institutions and ideas influenced medieval Europe and later Western societies. Outside college, these skills can help you evaluate claims about government, culture, religion, technology, and social change; compare institutions across periods; and reach evidence-based conclusions about complex contemporary issues.

Task:

Complete the assessment on Ancient Rome. The assessment will evaluate the learning objectives and skills identified in this document. To prepare, complete the learning tasks and review the materials listed below.

Preparation Materials and Tasks:

- Read and study the assigned textbook chapter or section on Ancient Rome.
- Review course notes or lecture materials on the Roman Republic and Roman Empire.
- Study assigned primary source excerpts, if provided.
- Review maps, timelines, and key terms related to Roman history.
- Review instructor-provided study questions or discussion questions.

Additional Learning Tasks:

- Identify key people, events, institutions, and developments in Roman history.
- Create a comparison chart of the Roman Republic and Roman Empire.
- Explain major causes and consequences of Roman expansion.

- Analyze one or more primary or secondary sources related to Ancient Rome.
- Prepare written responses that use historical evidence to support conclusions.
- Contact the instructor when needed.

Optional Instructional Videos:

Students who would like additional explanations of the topics in this module may search for instructional videos on [YouTube](#) website.

Enter the following topics in the YouTube search bar:

- Origins of Ancient Rome
- Roman Republic
- Roman Empire
- Fall of the Roman Republic
- Pax Romana
- Christianity in the Roman Empire

Criteria for Success:

Use the examples and source analyses discussed in class as reference points for what well-supported, incomplete, and unsupported historical responses look like. The following point ranges summarize those standards:

- **9–10 points:** Response accurately addresses the question; uses relevant historical evidence; explains causes, consequences, comparisons, or connections clearly; and is well organized.
- **5–6 points:** Response addresses the question but is incomplete; uses limited evidence; contains some misunderstanding; or does not fully explain historical connections.
- **0–2 points:** Response is incorrect, unsupported, missing most required elements, or shows serious misunderstanding of the historical material.
- Partial credit is given at the discretion of the instructor only.

Module Conclusion:

Understanding Ancient Rome is essential for understanding the later development of Western civilization. Roman law, political institutions, military organization, engineering, urban life, religion, and cultural traditions influenced medieval Europe and later Western societies. The study of Rome also prepares students for later course topics on the transformation of the ancient world, the rise of medieval kingdoms, the Byzantine Empire, and the development of Christianity in Europe.

Whole-Test TILT Example: ECO 201 Principles of Macroeconomics

Module: Demand, Supply, and Market Equilibrium

Module Intro:

In this module, students will study the demand and supply model and use it to explain how markets operate. Students will learn how demand and supply are represented graphically, how market equilibrium is determined, how changes in determinants shift demand and supply, and how market failure affects market outcomes.

Purpose:

The purpose of this assessment is to evaluate your ability to use the demand and supply model to analyze market behavior. This assessment will measure your ability to apply the model, explain how determinants affect demand and supply, illustrate market equilibrium, and analyze how changes in market conditions affect prices and quantities.

Main Skills of the Module (VCCS Learning Objectives):

- Apply the demand and supply model.
- Analyze the effects of determinants on demand and supply.
- Illustrate market equilibrium using the demand and supply model.
- Analyze the impact of market failure on demand and supply.
- Communicate economic concepts clearly using words, graphs, and economic reasoning.

These skills align with the ECO 201 course goals of communicating economic concepts and solving problems with economic theory and methodology. These skills build on your earlier study of scarcity, choice, opportunity cost, and economic models, which introduced the reasoning used to analyze how individuals and societies allocate limited resources. They provide the foundation for later course topics including aggregate demand and supply, fiscal and monetary policy, and international trade because those topics also require you to analyze how changing conditions affect prices, quantities, and economic outcomes. Outside college, these skills can help you interpret changes in prices and availability, evaluate claims about markets and public policy, and explain how consumer, business, or government decisions can affect economic outcomes.

Task:

Complete the assessment on Demand, Supply, and Market Equilibrium. The assessment will evaluate the learning objectives and skills identified in this document. To prepare, complete the learning tasks and review the materials listed below.

Preparation Materials and Tasks:

- Read and study the assigned textbook section on demand and supply.
- Review instructor notes on demand, supply, and market equilibrium.
- Study examples of demand and supply graphs.
- Complete assigned homework or practice problems.
- Review key terms: demand, supply, equilibrium price, equilibrium quantity, surplus, shortage, determinants of demand, determinants of supply, and market failure.

Additional Learning Tasks:

- Draw and label demand and supply graphs.
- Identify equilibrium price and equilibrium quantity.
- Explain the difference between a movement along a curve and a shift of a curve.
- Analyze how changes in determinants affect demand, supply, price, and quantity.
- Solve practice problems involving shortages, surpluses, and changes in market equilibrium.
- Explain answers using both graphs and written economic reasoning.
- Contact the instructor when needed.

Optional Instructional Videos:

Students who would like additional explanations of the topics in this module may search for instructional videos on [YouTube](https://www.youtube.com) website.

Enter the following topics in the YouTube search bar:

- Demand and Supply Model
- Market Equilibrium
- Demand Curve and Supply Curve
- Shifts in Demand and Supply
- Surplus and Shortage in Economics
- Market Failure

Criteria for Success:

Use the graphs and worked examples discussed in class as reference points for what accurate and complete, partially complete, and incorrect economic analysis look like. The following point ranges summarize those standards:

- **9–10 points:** Response correctly applies the demand and supply model; graph is accurate and clearly labeled; explanation correctly describes the economic reasoning; final answer is correct.
- **5–6 points:** Response shows mainly correct understanding but is incomplete; graph may contain errors or missing labels; explanation may be partial; final answer may or may not be correct.
- **0–2 points:** Response is incorrect, missing most required elements, lacks an appropriate graph or explanation, or shows serious misunderstanding of the demand and supply model.
- Partial credit is given at the discretion of the instructor only.

Module Conclusion:

Understanding demand, supply, and market equilibrium is essential for the study of economics. The demand and supply model helps explain how prices and quantities are determined in markets and how changes in economic conditions affect market outcomes. This model prepares students for later topics such as GDP, inflation, unemployment, aggregate demand and aggregate supply, fiscal policy, monetary policy, and international trade.