CPCC Certification

SCIENCE Course Rubric

School:

Course:

Evaluators:

Working Definition:

A “college-ready” course consists of intellectually rigorous coursework that covers sufficient content knowledge and requires students to demonstrate the higher-order thinking skills that will enable them to engage independently in non-remedial college level work.

Thank you for helping the DOE to evaluate high school courses for CPCC certification.
The CPCC certification process is designed to recognize high school courses that are preparing students for college and to reward schools with credit on the college readiness metric of the Progress Report for all students who pass one these courses. In order to earn CPCC certification, a course must pass both a quantitative and a qualitative evaluation.

This packet is designed to help you make a qualitative determination of the college-readiness of a course. The qualitative evaluation focuses on two main areas: ***Content*** and ***Academic Rigor***.

What you should have

In addition to this evaluation packet, you should also have received a complete application for the course you are evaluating. That application should include the following:

1. A syllabus, curriculum map, scope and sequence, or equivalent document
2. A list of all key texts that are used in the course
3. Copies of all major assignments that students are expected to complete (including rubrics, scoring guides, etc.)
4. Copies of graded student work for three major assignments
5. An explanation of the grading policy
6. An explanation of any prerequisite requirements for student to enroll in the course
7. Written responses to short answer questions

Where you can confidently make a decision on the course's qualitative evaluation outcome (in either direction), please do so. If you require the submission of an additional course artifact or document, please contact Valerie Samn (vsamn@schools.nyc.gov).

What is included in the application review packet

1. **Two worksheets**, one for each category – these worksheets are intended to help you focus on aspects of the application that pertain to the categories covered in the rubric.
2. A **rubric** with 2 categories.
3. A **matrix** that demonstrates how the Rubric Determinations will be used in the Overall Determination.
4. A **reviewer recommendation** section where you will provide a recommendation based on your overall impression of the course.
5. An **application feedback form** where you will provide concrete strengths and areas for growth/areas of concern that will be shared with the school.

Recommended use of the packet

1. Read the application.
2. Fill out the rubric.

   The category worksheets are included to assist in your rubric determination. While they are not officially "counted" as part of the evaluation, we ask that you complete them as part of your review process.
3. Complete the Reviewer Recommendation.

   Based on your review of the entire application, would you recommend that this course be certified as college-ready? Why or why not?
4. Complete the Application Feedback form.
   a. What are some strengths of the course that emerge from the application?
   b. What are some areas for growth (for course to be certified) or areas of concern (courses the do not meet certification criteria) that emerge from the application?

CONTENT– Worksheet (Science)	Very Often	Often	Somewhat Often	Infrequent or Never
Based on the evidence provided, are students prepared for the content knowledge expectations of students who enroll in a non-remedial college Science course? • Students understand and can apply the scientific method accurately designing and conducting scientific investigations during which they formulate and test hypotheses • Students conduct scientific labs. • Students use mathematical skills/concepts to solve scientific problems (e.g. algebraic formulas, basic trigonometric principles, basic statistics and probability). • Students problem solve using various strategies and approaches.				
Based on the evidence provided, are students prepared for the content knowledge expectations of students who enroll in a non-remedial college Science course in the specific subject (e.g. Chemistry, Physics, etc.)? • Students understand the KEY concepts or big ideas of the subject. See attached subject-specific concept lists (if available) to help you guide your determination.				
Based on the evidence provided, are students asked to and prepared to demonstrate the Reading (RST) and Writing (WHST) Expectations as articulated in the NYC-CCLS? The anchor standards are paraphrased below. • Students analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, and identify important issues that are left unresolved. (*RST.6, RST.8*) • Students determine the central ideas or conclusions of a text and accurately summarize complex concepts, processes or information. (*RST.2*) • Students evaluate the hypothesis, data, analysis, and conclusions in a science or technical text, verifying data when possible and corroborating or challenging conclusions with other sources of information. (*RST.8*) • Students integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. (*RST.7, RST.9*) • Students construct written arguments on substantive topics that introduce precise claims and use valid reasoning and cite specific textual evidence/data from primary and secondary sources to support the claims. (*WHST*.1) • Students produce clear and coherent writing appropriate to task, purpose, and audience using a formal style and objective tone while attending to the norms and conventions of writing for the discipline. (*WHST*.4) • Students write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. (*WHST*.10) • Students develop and strengthen writing through the writing process. (*WHST*.5) • Students use technology to produce and publish writing and to interact with others. (*WHST*.6) • Students use academic language in their writing. (*WHST*.2d)				

Are students in the course exposed to the experimental design skills expected of students who enroll in an introductory Science course in college? • Students demonstrate the ability to create a hypothesis. • Students demonstrate the ability to identify and use standard lab equipment. • Students demonstrate the ability to complete a lab report. • Students demonstrate a strong knowledge of measurement. • Students demonstrate a working knowledge of safety procedures in a lab setting.				

CONTENT DEMAND – Science

ALL Science Courses	Content Demand	Yes	No
	Measuring		
	Observing		
	Gathering, organizing, and interpreting data		
	Predicting and inferring		
	Classifying		
	Communicating		
	Making models		
	Identifying variables		
	Working with materials		

Environmental Science	Content Demand	Yes	No
	The relationship of the earth's various systems and of the earth and the sun		
	Geology • The history and structure of the earth • The history of the solar system • The process of volcanism and erosion		
	The interaction of the environment and biota (including humans) and the consequences of that interaction.		

Chemistry	Content Demand	Yes	No
	The nature of the physical and chemical properties of matter (atoms, molecules, ions, etc.) • The states of matter • Acid and base chemistry		
	The principles of atomic structure and bonding • Electrons, protons, and neutrons • Composition of molecules – made up of atoms in a unique and consistent arrangement • The relationship between electronic configuration of atoms and the chemical properties of an element		
	The principles that explain chemical reactions • Substances react with other substances to form new substances (compounds) with different characteristics and properties • Stoichiometry		

Living Environment	Content Demand	Yes	No
	The general structure and function of cells • The parts of the cell • The range and variation of cells (different types of cells, cells perform different functions for an organism, different types of organisms have cells specialized for different functions) • The importance of water and carbon to cells • The process of cell division (mitosis and meiosis) and the production of new cells and the passing on of genetic information • The role of DNA in eukaryotic cells • The role of cells in transforming energy from one form to another (photosynthesis and respiration), the production of ATP, and the chemical reactions involved in cell function • The transporting/exchange of materials across a membrane		
	The genetic principles that guide the inheritance of biological traits • Mendel's laws of heredity • The chemical and structural properties of DNA		
	The organization and classification of living systems • Multicellular organisms have a variety of specialized cells, tissues, organs, and systems that perform specialized functions • Ways in which living things can be classified based on their internal and external structure, their development, and their DNA sequence		
	Evolution • Concept of natural selection • The theory of evolution • How DNA and protein sequences are used to infer evolutionary relationships		

Physics	Content Demand	Yes	No
	The concept of energy • The relationship between heat and temperature • The First Law of Thermodynamics and the conservation of energy • The Second Law of thermodynamics and entropy • The distinction between kinetic and potential energy • Transfer of energy • Optics • Electricity and magnetism • Series and parallel circuits		
	Motion and the principles that explain it • Newton's Laws • Characteristics and properties of sounds and electromagnetic waves • Range of the electromagnetic spectrum		
	The kinds of force that exists between objects • Gravitational force • Electrical force • Electromagnetic force		
	Concepts related to modern physics • Theory of special relativity • Speed of light		
	Matter and its properties • Mass • Density		
	Basic Laws • Conservation laws of energy • Laws governing electrical and magnetic forces • Relationship between electrical currents and magnetic fields		

ACADEMIC RIGOR – Worksheet (Science)	Very Often	Often	Somewhat Often	Infrequent or Never
Based on the evidence provided, is the course material that students are expected to master sufficiently rigorous and intellectually challenging?				
In order to pass the course, are students expected to complete tasks that demonstrate mastery independently without significant assistance from the teacher or peers?				
Based on the evidence provided, are students asked to complete tasks that ask them to use strategic thinking and reasoning (DOK Level 3) and/or extended thinking (DOK Level 4)? • Course work requires students to use reasoning and to develop a plan to approach a problem. • Course work requires decision-making and justification. • Course work requires students to go beyond the text and explain, generalize, or connect ideas. Course work requires students to read sufficiently complex texts based on the expectations of the CCLS. • Course work requires students to develop a logical argument and cite evidence. • Course work involves an investigation or accurate application of scientific concepts to real world problems. • Course work requires students to analyze or synthesize information for multiple sources. • Course work requires time to research, problem solve, and process multiple conditions of the problem or task. • Course work requires students to record, analyze, and represent data in multiple ways.				

Science Course Rubric

Category I: CONTENT

- *Is the material taught in this class the material that students are expected to know when beginning an introductory level Science course?*
- *Are students who pass this course prepared with the skills they will need to succeed in an introductory level Science course?*
- *In order to pass the course are students expected to complete work to a level such that they demonstrate mastery of the content and skills and can apply what they learn to new and novel situations without the support of the teacher?*

	Considering the determinations you made using the Content Worksheet criteria, how would you rate the CONTENT of this course?
College-Ready	• Students who pass the class will be familiar with most, if not all, of the scientific concepts and content knowledge they are expected to know in an introductory college course. • The skills embedded in this course are clearly and undoubtedly sufficient to prepare students for an introductory college course.
Likely College-Ready	• Students are exposed to most of the scientific concepts and content knowledge they are expected to know in an introductory college course. • The skills embedded in this course are likely to be sufficient to prepare students for an introductory college course.
Potentially College-Ready	• Students are exposed to some of the scientific concepts and content knowledge they are expected to know in an introductory college course. • The skills embedded in this course may be sufficient to prepare students for an introductory college course.
Unlikely to be College-Ready	• The course does not cover enough of the scientific concepts and content knowledge expected to prepare students for introductory level course. • The skills embedded in this course are unlikely to be sufficient to prepare students for an introductory college course.

Category II: ACADEMIC RIGOR

- *Is the material taught in this class sufficiently rigorous to consider this course College-Ready?*
- *Are student expected to complete tasks that are intellectually rigorous?*

	Considering the determinations you made using the Academic Rigor Worksheet criteria, how would you rate the ACADEMIC RIGOR of this course?
College-Ready	• Academic tasks require students to engage deeply with and accurately apply scientific concepts on a regular basis. • Students are regularly asked to complete demanding work requiring higher-order thinking that will prepare them for an introductory college course.
Likely College-Ready	• Academic tasks are challenging and students are required to engage deeply with and accurately apply scientific concepts on a regular basis. • Some of the work that students are asked to complete requires higher-order thinking that will prepare them for an introductory college course.
Potentially College-Ready	• Academic tasks are challenging but students interact with the material inconsistently OR course content is inconsistently challenging. • Very little of work that students are asked to complete requires higher-order thinking that will prepare them for an introductory college course.
Unlikely to be College-Ready	• Academic tasks are either not challenging enough OR students are not required to engage with material at anything but a cursory level. • Almost none of the work that students are asked to complete requires higher-order thinking that will prepare them for an introductory college course.

OVERALL DETERMINATION

In order to "Pass" the Qualitative Evaluation, a course must be eligible for either a 1- or 3-year certification according to the Rubric Determination ***AND*** *receive a "Yes" designation from the Reviewer Recommendation.*

Rubric Determination

		ACADEMIC RIGOR			
		College Ready	Likely College-Ready	Potentially College-Ready	Unlikely to be College-Ready
CONTENT	College Ready	3-Year Certification	3-Year Certification	Does not meet	Does not meet
	Likely College-Ready	3-Year Certification	1-Year Certification	Does not meet	Does not meet
	Potentially College-Ready	Does not meet	Does not meet	Does not meet	Does not meet
	Unlikely to be College-Ready	Does not meet	Does not meet	Does not meet	Does not meet

Reviewer Recommendation

Is the work (both the content and the types of tasks) that students are expected to complete at least as challenging as the work in other College and Career Preparatory Course Index (CCPCI) courses?

	Based on your holistic review of the course and considering the entirety of the application, do you recommend that this course receive certification as a "college-ready" course? Indicate Yes or No and then provide a short rationale for your recommendation.
Yes	
No	

Application Feedback

Strengths

Please describe 3 – 5 strengths that emerge from the application.

Ex. All unit tests ask students to apply mathematical concepts to real world problems and to demonstrate their reasoning around these applications in writing.

1.

2.

3.

Areas for Development

Please describe 3 – 5 areas of concern that emerge from the application.

Ex. The application material does not adequately demonstrate course work that involves an investigation of application to real world problems or that requires students to analyze or synthesize information from multiple sources.

1.

2.

3.