RUTGERS
NEW BRUNSWICK

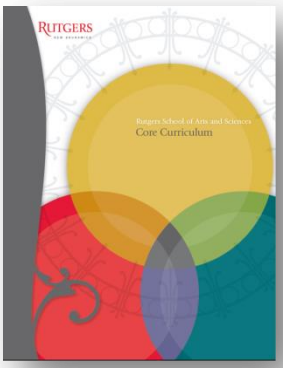
A Faculty Guide to Submitting Courses for Certification for the SAS Core Curriculum

2016 edition

The Core Curriculum

Click here for the brochure that explains the philosophy and purpose of the Core.

The Core Curriculum focuses on the learning goals that form the core of liberal and sciences education at a leading 21st Century public research university. These goals permeate many of our courses and fields of study making fulfillment of Core requirements an integrated part of an undergraduate curriculum that also includes completing major, minor, and elective credits. Progress in completing the Core is measured not by the number of courses taken, but by the goals achieved. Students exercise meaningful choice among courses specifically designed for the Core and introductory level offerings drawn from across disciplines.



The Core Curriculum begins with four learning goals that bring the diverse and rich intellectual heritage of the liberal arts and sciences to bear on the **21st Century Challenges** Rutgers graduates will face as global citizens and leaders.

Emphasizing the ability to critically examine the natural environment, human behavior, and the individual's role in society, the Core Curriculum's **Areas of Inquiry** learning goals develop a range of critical thinking skills. These goals stretch the boundaries of traditional academic disciplines by leading students back to those questions that predate the artificial division of knowledge into distinct majors and minors.

The Core Curriculum equips Rutgers students with the **Cognitive Skills and Processes** central to undergraduate studies, life-long learning, and participation in the world of ideas and the corridors of power. Through the Core, students hone their **Writing and Communication** skills and develop their **Quantitative and Formal Reasoning** skills. And, the **Information Technology and Research** goals take students behind facile assumptions to examine conduits and technologies of information (and misinformation) and their relationship to knowledge in the 21st Century information economy.

A complete faculty guide to the goals follows.

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CORE CURRICULUM: A Faculty Perspective

Courses specifically certified as satisfying the common Core Curriculum Requirements are limited to those that met the Core Requirements Committee's 4 criteria:

- One or more of the **Core Curriculum goals are front and center** in the design of the course.
- An **assessment plan** is included indicating how aggregate student achievement of the Core goals will be assessed.
- The course is **accessible** to a wide range of students **and** the goals have **not been met by prerequisites**.
- The course, defined by its number (and any cross-listed number), addresses the Core goal **every time** it is offered.

In the interest of transparency to students, the relevant Core Curriculum goals should be listed clearly on the syllabus. Courses can – and should -- meet multiple learning goals and students can count a single course as meeting multiple learning goals.

notes to faculty regarding courses to be certified as meeting these goals	**ASSESSABLE STUDENT LEARNING OUTCOME GOALS** Upon completion of the Core Curriculum ***STUDENTS WILL BE ABLE TO:*** ☐ Red boxes indicate the number of ≥three credit courses student need to take.
Syllabi should clearly specify which one or more of the four goals the course places front and center in its design and the salience of the course to a **clearly identified 21st century challenge**	**21C 21st Century Challenges** (6 credits) *Students meet 2 goals.* ☐ **a. Analyze the degree to which forms of human difference shape a person's experiences of and perspectives on the world.** ☐ **b. Analyze a contemporary global issue from a multidisciplinary perspective.** **c. Analyze the relationship that science and technology have to a contemporary social issue.** **d. Analyze issues of social justice across local and global contexts.**

Continued

Pages 10-27 are an Appendix containing the Core Curriculum Assessment Rubrics.

Disciplines do not "own" areas.	**Areas of Inquiry**
ALL courses in this group MUST meet **goal e** and (f or g or both.)	**NS** Natural Sciences (6 credits) *Students must meet 2 goals.* **e. Understand and apply basic principles and concepts in the physical or biological sciences.** **f. Explain and be able to assess the relationship among assumptions, method, evidence, arguments, and theory in scientific analysis.** **g. Identify and critically assess ethical and societal issues in science.**
All courses in this category – "Social and Historical Analysis"-- must meet at least one of the **shared** goals (h, eye, j) **in addition to** at least one of the specific Historical (k, l) or Social (m, n) Analysis goals.	Social and Historical Analysis (see below – *all courses should meet at least one of h, i, and j*) **h. Understand the bases and development of human and societal endeavors across time and place.** **i. (eye) Explain and be able to assess the relationship among assumptions, method, evidence, arguments, and theory in social and historical analysis.** **j. Identify and critically assess ethical issues in social science and history.**
	HST Historical Analysis (3 credits) *Students must meet one (h, I ,or j) and one (k or l).* **k. Explain the development of some aspect of a society or culture over time, including the history of ideas or history of science.** **l. Employ historical reasoning to study human endeavors.**
	SCL Social Analysis (3 credits) *Students must meet one (h, i, or j) and one (m or n).* **m. Understand different theories about human culture, social identity, economic entities, political systems, and other forms of social organization.** **n. Apply concepts about human and social behavior to particular questions or situations.**
Consistent with the **REPORT OF FOREIGN LANGUAGE ADVISORY COMMITTEE** only one or two "late-intermediate" or "early-advanced" courses per language will be certified for **AHq**.	**AH** Arts and Humanities (6 credits) *Students must meet two goals.* **o. AHo Examine critically philosophical and other theoretical issues concerning the nature of reality, human experience, knowledge, value, and/or cultural production.** **p. AHp Analyze arts and/or literatures in themselves and in relation to specific histories, values, languages, cultures, and technologies.** **q. AHq Understand the nature of human languages and their speakers.** **r. AHr Engage critically in the process of creative expression.**

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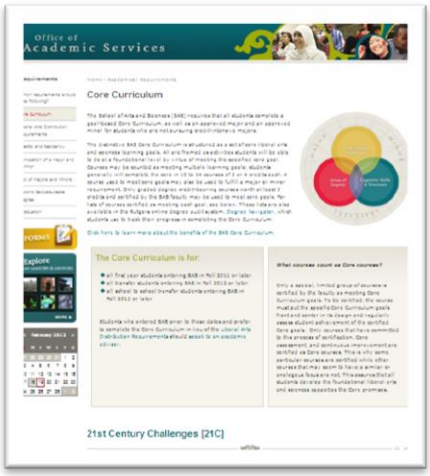
	Cognitive Skills and Processes
Students meet WC/s1 in 01:355:101. Students take two additional courses that include instruction on writing and communication – one that includes revision =WCr (s-2); and one that involves communication in the discipline=WCd (t). **All courses in this category should address, and assess on, more than one goal including WCr or WCd.**	Writing and Communication 3 courses (9 credits including 01:355:101;WCr; and WCd) ☐ **s. (s1) WC Communicate complex ideas effectively, in standard written English, to a general audience. 01:355:101** ☐ **(s2) WCr Respond effectively to editorial feedback from peers, instructors, and/or supervisors through successive drafts and revision.** ☐ **t. WCd Communicate effectively in modes appropriate to a discipline or area of inquiry.** **u. Evaluate and critically assess sources and use the conventions of attribution and citation correctly.** (also consider submitting for goals **y** or **z**) **v. Analyze and synthesize information and ideas from multiple sources to generate new insights.** (also consider submitting for goals **y** or **z**)
QQ/goal w includes disciplinary specific methods courses. **QR**/goal x includes Math courses (e.g. 640:103 and 640:115; or their equivalents) and formal reasoning courses.	Quantitative and Formal Reasoning (6 credits) *Students must meet 2 goals.* ☐ **w. QQ Formulate, evaluate, and communicate conclusions and inferences from quantitative information.** (also consider submitting for goal **y**) ☐ **x. QR Apply effective and efficient mathematical or other formal processes to reason and to solve problems.**
These goals do not have to be met through taking a course focused solely on these goals, which are also closely aligned with **goals u, v, and w above**. It is more likely that students will meet these goals while engaging in advanced work in a particular discipline.	**ITR** Information Technology and Research (3 credits or equivalent i.e. may be fulfilled with a 'body of work') *Students must meet one goal.* ☐ **y. Employ current technologies to access information, to conduct research, and to communicate findings.** **z. Analyze and critically assess information from traditional and emergent technologies.** **aa. Understand the principles that underlie information systems.**

In addition to being programed into DN, a **complete list of courses certified in the Core** to date can be found through links on the SAS Office of Academic Services webpage: http://sasundergrad.rutgers.edu/academics/requirements/core



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How are courses certified for inclusion in the Core Curriculum?

Departments submit courses to the Core Requirements Committee (CRC) which is made up of faculty representatives from each New Brunswick school that requires its students to complete the NB Core Curriculum. It is overseen by the Dean for Educational Initiatives and the Core Curriculum, Susan Lawrence. The CRC reviews the requests for certification in consultation with submitting departments and forwards its recommendations in a report at the end of each semester. Once this report receives faculty approval, the recommended courses are added to DN and to the online list of courses that meet each goal category. Notations of goal category are also included in the schedule of classes.

Once a new or existing course is certified, it will count toward the Core for all students who have already taken it but not yet graduated, and all students who will take it in the future. But, individual requests for certification of a course by a student or a faculty member will not be entertained; **it is crucial to our students' success that faculty, departments, and advisors not suggest to students that a course will count for the Core unless and until this official certification process is completed.**

What courses are appropriate for the Core Curriculum?

The new Core focuses on the student's achievement of goals and attainment of capabilities at a foundational level. By design, the Core Curriculum learning goals track nearly any reasonable articulation of the fundamental goals of a liberal arts and sciences curriculum. Thus, virtually all the courses we offer will, in some measure, advance student achievement of some of these Core goals. But, of course, we don't want to certify every course we offer as meeting Core Curriculum goals; there was very clear faculty agreement that the Core will be more meaningful to students if there are shorter, more focused, lists of courses than we have been accustomed to under distribution requirements.

Criteria for Certification: In its implementation of faculty intentions for the new Core, the Core Requirements Committee (CRC) has adopted the following central working principles:

1. **The relevant Core learning goals must be front and center in the course design and highlighted on the first page of the syllabus**, maximizing transparency for students and for the CRC.

2. Courses must include a **plan for assessment of aggregate student achievement of the Core goal(s) and assessment results must be submitted to the Core Requirements Committee.** The issue is not whether the *course* does the activity listed in the learning goal, but rather, are the *students* able to *do* the cognitive activity identified in the goal upon completion of the course. Further details on assessment are provided below.

3. Courses should be **accessible to a wide range of students,** equipping students as lifelong learners, global citizens, and productive members of society irrespective of their ultimate specialization. Generally, certified courses will be **100 or 200 level courses**. Courses **will not be certified** for the Core **when students will necessarily have already met the proposed Core learning goals by taking the prerequisite courses**.

Pages 10-27 are an Appendix containing the Core Curriculum Assessment Rubrics.

4. Courses will only be certified when they **address the learning goal(s) every time they are offered** irrespective of instructor, section, semester, or particular topic of focus. "Topics" or "Seminar" courses will only be certified if they include an embedded assessment tool for the Core goal(s) that will be employed in all sections of the course each time it is offered. **Cross-listing departments must all agree to certification in the Core and should be consulted with before proposing any course for certification.** For each course number certified for the Core, a generic course synopsis (or full syllabi) that includes the Core Curriculum learning goals that the course has been certified for should be available online through the department web page and the online schedule of classes at all times, updated as necessary.

Online and hybrid courses must meet all the same criteria. In addition, since the online format is often unfamiliar to those who became faculty members before the digital revolution reached undergraduate instruction, the CRC believes it needs additional information to make informed decisions.

- SAS courses (newly offered online and brand new online courses) must be approved by the SAS Curriculum Committee per its policy on hybrid and online courses. See http://sasoue.rutgers.edu/ Courses from other schools should be vetted by the offering school's curriculum committee.
- the request for certification must include CRC access to the online course itself.
- the course should be offered at least once and the assessment results included before it is considered for certification.
- once certified, Core goal assessment reports must be submitted every semester along with some sample assignments used for assessment of the Core learning goals.

In that the Core is largely targeted to traditional first and second year students, the CRC is particularly concerned that this population often lacks the autodidactic skills required for online success and that the online environment may not provide the kind of student engagement that evidence shows promotes retention.

Assessment Plans

Assessment plans should identify what, when, and how goals will be assessed. The assessment plan may state that the course will **use the CRC's Core rubrics** to score a particular assignment, **AND include representative samples of that assignment – specific exam questions or paper assignments, for instance, that require students to DO the certified Core goal in the context of the particular course material.** Alternately, faculty can also choose to assess a full portfolios of student work using the Core rubrics.

WHY? The CRC believes that, in line with emergent best practices nationally and globally (and accreditation requirements), assessment results provide the best evidence that a course is succeeding in enabling students to meet Core learning goals and the best opportunity for evidence-based improvement of pedagogy. The faculty and the CRC are committed to authentic, minimally invasive, efficient, and valid formative assessment tools suited to our specific learning goals rather than using national standardized tests of "critical thinking" (e.g. the CLA) separated from faculty control of the curriculum.

HOW? A "best practice" assessment is simply to consistently include an assignment or exam question that asks students to "do" the certified Core goal in the context of the specific course material, and score the assignment using uniform rubrics in each section of the course each semester.

Pages 10-27 are an Appendix containing the Core Curriculum Assessment Rubrics.

The CRC has developed rubrics for each of the Core learning goals. Click here to see these rubrics. These rubrics are "generic" in the sense that they are designed at a level of generality that allows them to be used to assess achievement of Core Curriculum goals in many different disciplines and across many different iterations of a course.[1]

The rubrics are designed with criteria for scoring that provide a substantive definition of each level of achievement, but faculty may also choose to use these definitions as a guide in specifying a percent of **objective test questions** answered correctly for each level of achievement IF the instructor has carefully identified a set of questions that are directly relevant to the certified goal. For example, an instructor may specify that getting 79%-70% correct is "satisfactory." A template that allows you to easily tag questions and compile this data using Scantron Excel reports is available on the webpage for the CRC rubrics, at http://sasoue.rutgers.edu/core/rubrics-for-core-goals.

"But, I already grade my students' performance!" Grading (evaluation and rank ordering of individual students) and assessment (documenting the extent to which the group of enrolled students leave the course with the abilities specified in the learning goals) are analytically distinct for the reasons listed in the table below:

ASSESSMENT VERSUS GRADING: *Assessment of student learning outcome goals is analytically distinct from grading. Assessment is about the extent to which the curriculum/course design successfully achieves the student learning outcome goals; grading is about evaluation, and rank ordering, of individual student performance on an assignment or in a course.*	
Assessment and grading can overlap when:	Assessment and Grading (appropriately) diverge when:
assignments or exam questions are directly related to the specified learning outcome goals to be assessed.	assignments represent steps toward the learning goal rather than actual achievement of the learning goal. (ex: homework assignments, reaction papers, etc.)
there is some common standard for evaluating the student work that is transparent and can used by multiple "graders" --- "objective test" answer keys; substantive rubrics, etc.	for other than "objective" tests, there is not a transparent, multi-user guideline for grading specific pieces of student work – an answer key or rubric.
best practice: multiple evaluators score a single piece of student work on a common rubric – example: committee evaluations of senior theses	
rubric, or other tool, is general enough to be used in multiple courses, sections, or on multiple assignments over time.	grading criteria focus on the specific material from the specific offering of the course rather than on the broader learning goal(s)
scores are collated into a broad picture of class (rather than individual) achievement of learning goals	scores are reported individually to students.
	effort, attendance, participation, etc. are counted toward the grade even though they do not directly measure student achievement of the particular learning goal.
	assessment may be done on the work of a carefully selected representative sample of students–but, grading obviously has to be done on the work of each individual student.

[1] Other commonly-used assessments tools that can be adapted for use in assessing Core Curriculum goals include pre-tests/post tests and concept maps. Contact Karen Dennis for more information about these tools. Kdennis@sas.rutgers.edu

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That said, **the Core rubrics can be incorporated into standard methods of evaluating/grading students.** Instructors may use the Core rubric as part of their grading of the student's assignment; typically, the instructor will want to also add additional criteria relevant to the specific course and assignment.[2] The scores on these additional items will constitute part of the student's grade, but should **not** be included in the assessment results submitted to the CRC. In order to further ease this process, a Core Rubric tool is being added to sakai and we will announce when it is available.

What is a rubric?
A rubric is a set of scoring criteria used to make scoring transparent and consistent across users. Rubrics are most frequently set up as tables with *criteria or elements* necessary for a successful whole listed on one axis and *level of performance* listed on the other. In a fully developed rubric, the cells are each filled in with descriptions of what is necessary to reach each level of performance on each criteria.

Assessment Reporting: The CRC will ask departments for **assessment reports on all Core certified courses at 3 year intervals** such that each year the CRC will review assessment reports from a third of the departments. Generally, one should expect at least two-thirds of students to meet the assessed goal at the "satisfactory" level or better. Results below this "benchmark" should trigger some re-evaluation of the pedagogy or the assignments used to assess achievement of the goal. In fact, the CRC has found that most faculty chose to modify courses even when this minimal benchmark is met and the CRC commends them for doing so. **Adjustments should be implemented and all of these "close the loop" changes should be included in the assessment report.**

Cross-listed courses should report with the department that typically staffs the course.

The **best practice** is to assess student achievement of the learning goal *every* time the course is offered; however, the CRC only requires a Core report once every three years. Departments are welcome to submit more often.

The reporting form for the Core Curriculum is available here. It is a good idea to review it as you plan for assessment.

The **purpose** of the assessment reports is three-fold:

- compile systematic evidence that substantiates our claim that students are achieving the Core Curriculum goals;
- alert the instructors and departments if there is some gap between the aspirations of the course and actual student achievement. Departments and instructors may then decide to modify the design of the course to improve achievement of student learning outcome goals and/or re-evaluate the appropriateness and accuracy of the assessment tool = "close the loop," and;
- provide a trigger for department review of whether the course remains appropriate for the Core. If not, the course number should be changed and the Core Requirements Committee notified. "De-certification" of courses for the Core will proceed only on a consensual basis and will require a vote of the faculty, just as certification does.

[2] These rubrics can also provide solutions to other problems faculty commonly encounter. Rubrics provide an increasingly common and expected way to convey expectations to students, standardize grading across graders and sections, and efficiently provide students with constructive feedback on their work. In courses with multiple instructors, rubrics can be an effective and efficient way to coordinate faculty participation in the course. And, finally these rubrics can be useful to concretely show the students (and other stakeholders) what they can now do as a result of the course.

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NUTS AND BOLTS: Proposing a Course for Core Certification

- Proposals must be **endorsed by the offering department** and submitted through the **Course & Curriculum Proposal system**, at https://secure.sas.rutgers.edu/apps/sascc/main. ***Undergraduate Chairs*** *can request or authorize access by emailing Karen Dennis, at kdennis@sas.rutgers.edu.*

- **Review the syllabus**: does the course meet the CRC criteria? *See pg. 2 of the Guide.*

  - ☐ Is it clear that the Core goal(s) will consistently be ***front and center*** in the course design?
  - ☐ Have students already achieved the proposed goal(s) in a prerequisite? *The CRC does not certify courses for Core requirements that students already will have satisfied in a prerequisite.*
  - ☐ Does the syllabus **include the proposed Core Goal(s) on the first page**? *Please be sure this is the official wording, without alteration: course-specific learning goals on the syllabus can clarify connections to relevant content.*

    Please also be sure that no ***published*** *syllabus lists any Core goals unless and until the certification has been formally approved, to avoid confusing students.*
  - ☐ Certification in **HST, NS, SCL, WCD** or **WCR** requires a combination of Core goals. See the ***notes to faculty*** on pgs. 2-4 of the *Guide* for relevant guidelines.
  - ☐ Be prepared to provide the syllabus file in text (Word, RTF, or txt), pdf, or Excel format.

CRC CRITERIA:
- Front and center
- Assessment plan
- Accessible to wide range of students
- Always addresses learning goals

- There must be a **plan for assessing aggregate student achievement of the proposed Core goal(s) each time the course is offered**. Generally, this will include:

  - ☐ a statement that the relevant **CRC rubric(s)** will be used to score a **required** assignment in which students ***DO*** the proposed Core goal(s) in the context of the course material, ***AND…***
  - ☐ **a representative example of that assignment -** e.g., specific exam questions, or the required components of a research project/paper – that illustrates **how students will be required to demonstrate the desired learning outcomes** for the Core goal(s).
  - ☐ Be prepared to provide the assessment plan in text (Word, RTF, or txt), pdf, or Excel format.

- Proposals must be **agreed to by departments offering *cross-listed* courses.** *All cross-listed courses will be certified together - and Core-certified courses* ***may not be temporarily cross-listed*** *with other courses.*

- Proposals must be **agreed to by departments which offer pre-requisites, or offer courses with which this course might overlap.**

- **Is this an online course?** Special policies apply to certifying Core goals in any online course: *see pg. 6 of the Guide.*

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21C: 21st Century Challenges (6 credits) *Students meet 2 goals.*

GOAL a - *Student is able to…* **Analyze the degree to which forms of human difference shape a person's experiences of and perspectives on the world.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Specifically explicates links between multiple types of human difference and individuals' or groups' experiences of and perspectives on the world. **Evidences a sophisticated understanding** of those differences and their effects on an a 21st century challenge.	**Examines** links between some types of human difference relevant to the course and individuals' or groups' experiences and perspectives on the world. **Demonstrates an understanding** of some effect(s) of those differences on a 21st century challenge.	**Identifies** links between human differences relevant to the course and individuals' or groups' experiences and perspectives on the world, largely through **satisfactory presentation of course materials**. **Demonstrates some understanding** of how some differences affect a 21st century challenge.	**Fails to** link significant forms of human difference relevant to the course to individuals' or groups' experiences of the world and perspectives on the world as relevant to focus of the particular course. **Fails to** delineate the impact of differences on the issues that are central to the course.

GOAL b – *Student is able to…* **Analyze a contemporary global issue from a multidisciplinary perspective.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Demonstrates a sophisticated understanding in identifying, comparing, and contrasting at least two different disciplinary perspectives as applied to a pressing contemporary global issue. **Critically analyzes and assesses** the advantages/ scope and disadvantages/ limits of each perspective. **Draws original and thoughtful conclusions.**	**Identifies, compares, and contrasts** at least two different disciplinary perspectives as applied to a pressing contemporary global issue. **Notes some** advantages/ scope and disadvantages/ limits of each perspective. **Touches on broader connections and implications.**	**Satisfactorily summarizes** different disciplinary perspectives on a contemporary global issue. **Acknowledges that** each perspective has advantages and disadvantages. **Satisfactorily presents course materials.**	**Fails to** clearly identify disciplinary perspectives any relevant global issues. **Fails to** accurately distinguish between at least two different disciplinary perspectives on the issue. **Fails to** identify and explicate the advantages and disadvantages of each perspective. **Lacks any** critical analysis of any disciplinary approach to the issue.

GOAL c - *Student is able to…* **Analyze the relationship that science and technology have to a contemporary social issue.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Critically analyzes the extent to which science and technology can address a 21st C social issue AND/OR **critically explicates** how the issue is itself is the result of advances in scientific understanding or new technologies. **Thoroughly explores** the challenges and opportunities associated with various ways address the issue. **Demonstrates a high level of scientific literacy beyond that necessary for responsible citizenship and informed life choices.** **Distinguishes between** questions that are fundamentally moral or political and those that are scientific or technological.	**Explains** the extent to which a 21st C social issue can be addressed by science and technology AND/OR **explains** how the issue itself is the result of advances in scientific understanding or new technologies. **Assesses** possible ways to address the issue, with some attention to the complexities or challenges associated with each. **Demonstrates a level of scientific literacy necessary for responsible citizenship and informed life choices.** **Makes some distinctions between** questions that are basically moral or political and those that are scientific or technological.	**Satisfactorily presents** course material on the extent to which a 21st C social issue can be addressed by science and technology AND/OR how the issue itself is the result of advances in scientific understanding or new technologies. **Identifies** possible ways to address the issue, with some appreciation for the complexities or challenges associated with each. **Demonstrates an acceptable level of scientific literacy.**	**Fails to** articulate a link between a 21st C social issue and advances in scientific understanding or the development of new technologies. **Fails to** identify possible solutions or the need for possible solutions. **Major gaps** in scientific literacy. **Fails to distinguish** between scientific, moral, and political judgments. Relies on opinion or assertion instead of analysis.

GOAL d - *Student is able to…* **Analyze issues of social justice across local and global contexts.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Provides **detailed critical analysis** of what "social justice" means in local and global contexts and offers a critical assessment of existing approaches. Provides a **sophisticated exploration** of the causes of a particular social justice(s) or injustice(s) and the connections to other local and global issues. **Critically and thoughtfully evaluates** ways to advance social justice in the 21st c and identifies who/what would need to change to achieve social justice in a particular context. **Demonstrates original thinking** in assessing the complexities of the effort and potential solutions.	Provides a **robust explanation** of what "social justice" means in local and global contexts. **Explains** the causes of a particular social justice(s) or injustice(s), placing it in local and global contexts. **Demonstrates an understanding** of the goal of advancing social justice in the 21st C and who/what would need to change to achieve social justice in a particular context. **Identifies** resources for and obstacles to change, and alternative solutions.	**Satisfactorily presents** course material on what social justice means in local and global contexts. **Describes** causes of social (in)justice with some attention to local and global contexts. **Touches on** obstacles to and resources for change, and alternative solutions.	**Shows little understanding** of what is meant by social justice and **little or no reflection** on the meaning of social justice or the role context might play. **Minimal and/or unexamined claims** about causation. **Fails to** provide any context for the existing state of affairs, or any coherent discussion of paths to change. **Relies on opinion and polemic.**

Areas of Inquiry –

NS: Natural Sciences (6 credits) *Students must meet 2 goals; all courses must meet e and [f and/or g]*

GOAL e - *Student is able to…* **Understand and apply basic principles and concepts in the physical or biological sciences.**

OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Fully and clearly explains and applies basic scientific principles **with specificity and sophistication.** **Provides in-depth description** of the scientific method and its distinctive value; **critically differentiates** it from other approaches.	**Explains and applies** basic scientific principles and concepts **fully and clearly.** **Fully describes** the scientific method and its distinctive value; **differentiates** it from other approaches.	**Explains and applies some** basic scientific principles and concepts. **Describes** the scientific method; **demonstrates some understanding** of its distinctive value.	**Fails to** explain or identify and apply basic scientific principles and concepts. **Fails to** demonstrate an ability to describe the scientific method and its difference from other approaches. Relies on opinion rather than analysis.

And

GOAL f - *Student is able to…* **Explain and be able to assess the relationship among assumptions, method, evidence, arguments, and theory in scientific analysis.**

OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Clearly identifies and explains relationships among assumptions, method, evidence, arguments, and theory in scientific analysis **demonstrating a depth of understanding.** **Draws inferences that are consistent with the data; is specific and detailed in support of conclusions. Analysis of outcomes demonstrates superior understanding.**	**Identifies and explains** relationships among assumptions, method, evidence, arguments, and theory in scientific analysis. **Draws inferences that are consistent with the data. Offers an analysis of outcomes that is thorough and without errors that detract from analysis or conclusions.**	**Satisfactorily outlines** relationships among assumptions, method, evidence, arguments, and theory in scientific analysis. **Summarizes the purpose and findings of the research. Description of outcomes and/or support are satisfactory.**	**Fails to** accurately identify and explain relationships among assumptions, method, evidence, arguments, and theory in scientific analysis. **Does not** summarize or interpret the results or purposes of the research. **Does not** draw conclusions consistent with the data. **Inadequate** summary of results that involves significant errors.

Or

GOAL g – *Student is able to…* **Identify and critically assess ethical and societal issues in science.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Identifies and describes, in depth, complex social issues and ethical issues in science. **Recognizes and articulates a clear distinction** between objective and value-based perspectives and judgments; **fairly and effectively** presents the strengths and weaknesses of each. **Clearly separates objective analysis from personal preferences or bias.**	**Identifies and describes** social and ethical issues in science. **Identifies distinctions** between objective and value-based perspectives and judgments; **identifies** some strengths and weaknesses of each approach. **Makes some distinction between objective analysis and personal preferences or bias.**	**Satisfactorily recounts** social or ethical issues in science covered in the course material. **Describes some distinctions** between objective and value- based perspectives and judgment.	**Fails to** identify and describe social or ethical issues in science. **Does not distinguish** between scientific, political, religious, or ethical statements. **Discussion relies upon statements of opinion, not facts.**
If using specific objective questions identified for each goal, the instructor may set the bench marks for each rating as appropriate to the course and the discipline. For example: a typical benchmarking is laid out here: 90% or more correct	80%-89% correct	70%-79% correct	69% or less correct

Areas of Inquiry

Social and Historical Analysis (6 credits) Students must meet at least one (h, i, j) and one Historical Analysis (k or l) and one Social Analysis (m or n) goal [SCL and HST]

goals h, i, and j are 'background' goals – at least one of these must be addressed in all courses certified for goals k, l, (HST) or m, or n (SCL).

GOAL h - *Student is able to…* **Understand the bases and development of human and societal endeavors across time and place.**

OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Presents a **detailed and sophisticated analysis** of the bases and development of several human and societal endeavors across time and place. Presentation of facts and theoretical frameworks **demonstrates above-average understanding.**	Presents a **clear and correct account** of the development of one or more example(s) of human and societal endeavors. **Demonstrates solid understanding** of the relevance of context. **Describes facts and theoretical frameworks.**	**Satisfactorily recounts** course material on a relevant example of human and societal endeavors across time and place.	**Fails to** demonstrate knowledge or understanding of the bases and/or development of human and societal endeavors across time and place. **Discussion is cursory or incorrect, if present.**

Or (And/Or)

GOAL i. (eye) - *Student is able to…* **Explain and be able to assess the relationship among assumptions, method, evidence, arguments, and theory in social and historical analysis.**

OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Clearly identifies and explains relationships among assumptions, method, evidence, arguments, and theory in social and/or historical analysis, **demonstrating a clear grasp of the complexities of the issues.** Demonstrates **ability to conduct independent analysis as well as critically analyzed that of other scholars.**	**Identifies and explains** relationships among assumptions, method, evidence, arguments, and theory in given cases of social and historical analysis. Demonstrates **ability to critically evaluate other scholars' analysis.**	**Satisfactorily outlines** relationships among assumptions, method, evidence, arguments, and theory in scientific analysis. Demonstrates **ability to make some critical evaluations of other scholars' analysis.**	**Fails to** identify relationships among assumptions, method, evidence, arguments, and theory in social and historical analysis. **No apparent ability to critically evaluate other scholars' analysis.**

Or (And/Or)

GOAL j - *Student is able to…* **Identify and critically assess ethical issues in social science and history.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Identifies and describes, in depth, complex ethical issues in social science and history. **Carefully differentiates** between claims supported by various research methodologies and/or evidence-based argument and claims based on opinion. **Demonstrates advanced critical thinking** about the issue(s) that takes into account diverse perspectives of various actors and/or disciplines.	**Identifies and describes** ethical issues in social science and history. **Differentiates** between claims supported by research and/or evidence-based argument and claims based on opinion. **Evidences critical thinking** about the issue(s) that takes into account diverse perspectives of various actors and/or disciplines.	**Satisfactorily describes** an ethical issue in social science and/or history. **Articulates the difference between** claims supported by research and/or evidence-based argument and claims based on opinion, and demonstrates a satisfactory ability to identify each. **Takes into account** diverse perspectives of various actors and/or disciplines.	**Shallow or absent understanding** of ethical issues in social science and history. **Does not distinguish between** claims supported by research and/or evidence-based argument and claims based on opinion. **Does not take into account** diverse perspectives of various actors and/or disciplines.

goals h, i, and j are 'background' goals – at least one of these must be addressed in all courses certified for goals k, l, (HST) or m, or n (SCL).

And

HST: Historical Analysis (3 credits) *Students must meet one (h, i, j) and one (k or l).*

GOAL k - *Student is able to…* **Explain the development of some aspect of a society or culture over time, including the history of ideas or history of science.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Presents a **sophisticated analysis** of the development of a significant aspect – or complex of aspects - of a society or culture over time. **Makes evidence-based arguments and supports the analysis** with relevant facts and theoretical frameworks.	Presents a **clear and correct explanation** of the development of a significant aspect – or complex of aspects - of a society or culture over time. **Describes** relevant evidence, facts, and theoretical frameworks **and draws conclusions** based on them.	**Satisfactorily discusses** the development of a significant aspect – or complex of aspects - of a society or culture over time. **Describes** relevant evidence, facts, and theoretical frameworks.	**Fails to** adequately explain the development of an identifiable aspect of a society or culture over time. **Fails to** reference relevant facts, evidence, or theoretical frameworks.

GOAL l - *Student is able to…* **Employ historical reasoning to study human endeavors.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Uses historical reasoning or research methods to present a **detailed and thorough analysis** of important human endeavors across time and place. Factually accurate and **demonstrates a strong understanding** of contexts and chronologies. **Draws conclusions that are clear, convincing, and original.**	Uses historical reasoning or research methods to present a **clear and correct account** of relevant human endeavor(s) across time and place. Factually correct and **demonstrates a solid understanding** of contexts and chronologies.	**Satisfactorily presents** course materials applying historical reasoning or research methods to a human endeavor. Describes central facts correctly and demonstrates an **emerging understanding** of the importance of contexts and chronologies in historical reasoning.	**Fails to** successfully apply historical reasoning or research methods to a human endeavor. **Unaware** of relevant facts, contexts, or chronologies.

SCL: Social Analysis (3 credits) *Students must meet one (h, i, j) and one (m or n).*

GOAL m - *Student is able to…* **Understand different theories about human culture, social identity, economic entities, political systems, and other forms of social organization.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Presents a **clear, detailed, and thorough analysis of several different theories** about human culture, social identity, economic entities, political systems, or other forms of social organization. **Compares and critiques** theoretical approaches; addresses their respective strengths and weaknesses; and**, suggests possible extensions of analysis** in new directions.	Presents a **clear and correct account of more than one relevant theory** about human culture, social identity, economic entities, political systems, or other forms of social organization. **Identifies** strengths and weaknesses of each theoretical approach; and, **discusses its application** to a particular case.	**Satisfactorily discusses** theories addressed in the course materials about human culture, social identity, economic entities, political systems, or other forms of social organization. **Identifies** different possible theoretical approaches to a particular case.	**Fails to** satisfactorily discuss any theory about human culture, social identity, economic entities, political systems, or other forms of social organization. **Does not** discuss variations in perspective or theory in relation to the subject.

GOAL n - *Student is able to…* **Apply concepts about human and social behavior to particular questions or situations.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Demonstrates an **advanced understanding of a range of concepts** about human and social behavior **and applies them** to particular questions or situations **with skill**. **Considers** the strengths and weaknesses of the concepts applied, **and suggests possible extensions of the analysis** in new directions.	**Clearly explains and applies concepts** about human and social behavior in the context of applying them to particular questions or situations. **Considers** the strengths and weaknesses of the concepts applied.	**Satisfactorily recounts** the application of concepts about human and social behavior presented in the course materials. **Makes some assessment** of the relative strengths of the concepts applied.	**Fails to** describe or apply concepts about human and social behavior to particular questions or situations.

Areas of Inquiry –
Arts and Humanities (6 credits) *Students must meet two goals.* [AH]

AHo

GOAL o - *Student is able to…* **Examine critically philosophical and other theoretical issues concerning the nature of reality, human experience, knowledge, value, and/or cultural production.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Engages in **sophisticated critical examination** of philosophical and other theoretical issues concerning the nature of reality, human experience, knowledge, value, and/or cultural production central to the course. **Critically analyzes** these philosophical or other theoretical issues and **assesses the relative merits of each**.	Engages in **critical reading** of philosophical and other theoretical issues concerning the nature of reality, human experience, knowledge, value, and/or cultural production relevant to the course. **Constructs persuasive arguments** about these philosophical or other theoretical issues.	**Satisfactorily describes** philosophical and other theoretical issues concerning the nature of reality, human experience, knowledge, value, and/or cultural production through reliance on course materials. **Draws some critical conclusions** about these philosophical or other theoretical issues.	**Fails to** identify or engage philosophical or other theoretical issues concerning the nature of reality, human experience, knowledge, value, and/or cultural production. **Fails to** analyze or critique philosophical or theoretical issues; makes unsubstantiated assertions or substitutes opinion for analysis.

AHp

Goal p – *Student is able to…* **Analyze arts and/or literatures in themselves and in relation to specific histories, values, languages, cultures, and technologies.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Provides **a sophisticated analysis** of works of art or literature and a **critical assessment of the relationship** between them and their specific histories, values, languages, cultures, and/or technologies. Analysis is presented **effectively, accurately, and persuasively.** Strengths and weaknesses of varying accounts are **identified and critically evaluated.**	**Analyzes** the works of art or literature and **assesses the relationship** between them and their specific histories, values, languages, cultures, and/or technologies. Analysis is generally presented **accurately and persuasively**. **Attention is given** to the merits of alternate analyses.	**Satisfactorily presents** course material analyzing the works of art or literature and assessing the relationship between them and their specific histories, values, languages, cultures, and/or technologies. Analysis is **satisfactorily supported** by course material.	**Fails to** clearly identify works of art or literature relevant to the course. Does not place the work(s) in a context of their specific histories, values, languages, cultures, and/or technologies. **Analysis is absent**. Relies on opinion or makes unsubstantiated assertions. .

*The AHq goal may be met in two distinct families of courses. The criteria relevant to **standard language acquisition courses** at the late-intermediate or early-advanced level are described in the top half of the rubric. The criteria relevant to **courses focused on the subject of language(s)** from a theoretical and historical standpoint are described in the bottom half of the rubric. Courses fulfilling one version of the requirement need not concern themselves with fulfilling the other. In some cases, however, a course may combine elements from both.* ***- Foreign Language Advisory Committee (FLAC), 19 Dec 2011***

AHq

GOAL q – *Student is able to…* **Understand the nature of human languages and their speakers.**				
*Student demonstrates an understanding of basic concepts in **at least one** of following areas:*	OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
standard language acquisition courses *a. The essential components of language as a communication system* *b. How meaning is represented and conveyed in language* *c. The relationship between speech and writing*	Demonstrates a **full understanding** of language as a system; understands meaning as language-specific. Demonstrates a **strong grasp** of language-specific idiomatic meanings; **does not resort to literal translations.** Shows **strong awareness and command** of language register, from informal exchanges to formal written communication.	Demonstrates a **good sense** of the systematic nature of language and of language-based meaning. Demonstrates a **good grasp** of language-specific idiomatic meanings; **usually avoids resorting to literal translations**. Shows **good awareness and command** of language register, from informal exchanges to formal communication (written or oral).	Demonstrates **satisfactory sense** of the nature of language and of language-based meaning. Demonstrates **some grasp** of language-specific idiomatic meanings. Shows **some awareness and command** of language register, from informal exchanges to formal communication (written or oral).	**Does not** demonstrate an understanding of the systematic nature of language or language-based meaning. Demonstrates **no grasp** of language-specific idiomatic meanings; resorts to literal translations. Shows **no awareness** of language register, from informal exchanges to formal communication (written or oral).
courses focused on the subject of language(s) *d. Linguistic diversity and variation across space and time* *e. The role of speech and writing in culture, society, communication, and discourse*	Demonstrates a **strong understanding** of the relationship between linguistic meaning and the experience, world view, and culture of speakers and **analyzes** the role of social, historical, and political contexts in the process of linguistic transformation. Demonstrates **strong analytical and observational skills**.	Demonstrates **good understanding** of the relationship between linguistic meaning and the experience, world view, and culture of speakers and **assesses** the role of social, historical, and political contexts in the process of linguistic transformation. Demonstrates **good analytical and observational skills.**	Demonstrates a **satisfactory understanding** of the relationship between linguistic meaning and the experience, world view, and culture of speakers and of the role of social, historical, and political contexts in the process of linguistic transformation. Demonstrates **some analytical and observational skills.**	Demonstrates **little understanding** of the relationship between linguistic meaning and the experience, world view, and/or culture of speakers or the role of social, historical, and political contexts in the process of linguistic transformation. **Does not demonstrate analytical and observational skills.**

AHr

GOAL r – *Student is able to…* **Engage critically in the process of creative expression.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Formulates, critically analyzes, and expertly engages in the creative process in a particular medium. **Generates innovative and highly imaginative creative solutions** to creative challenges. **Establishes and applies a clear set of criteria for the critical evaluation of outcomes.**	**Fully describes and engages** in the creative process in a particular medium. **Generates imaginative solutions** to creative challenges. **Provides a critical evaluation of outcomes.**	**Satisfactorily describes and engages** in a creative process in a particular medium. **Effectively applies solutions** to creative challenges presented in course materials. **Evaluates outcomes and identifies strategies for improvement.**	**Does not** effectively engage in a creative process in a particular medium. **Fails to** apply lessons from the course to the creative endeavor. **Does not provide critical evaluation of the outcomes.**

Cognitive Skills and Processes –
Writing and Communication (9 credits including 01:355:101[s1/WC]; 2nd writing/communication [s2/WCr]; and 3rd disciplinary writing/communication [t/WCd]). [WC, WCr, WCd]

All courses in this category should address, and assess on, more than one writing and communication goal.

WC

GOAL s1 – *Student is able to…* **Communicate complex ideas effectively, in standard written English, to a general audience.** **GOAL MEET BY 01:355:101, REQUIRED**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Presents complex ideas as a **clear and compelling argument. Insightful, well-reasoned, and original analysis**. **Clear, easy to follow organization** with intro, body, and conclusion. **Eloquently-written.** Appropriate word choices. Free of grammar and spelling mistakes.	Makes a **clear argument**, based on **plausible reasoning. Sustains an argument** throughout the analysis. **Clear organization.** **Well-written** with only incidental word choice, grammar, or spelling errors.	Presents a **satisfactory argument and analysis** following the strictures of the course. **Satisfactory organization** that allows the reader to follow the argument. Writing is **satisfactory**.	**Fails to** make a cogent argument or to offer sound analysis of any but the simplest ideas. **Poorly organized** and difficult to follow, impeding meaning. **Multiple composition errors** that interfere substantially with comprehension.

WCr

GOAL s2 – *Student is able to…* **Respond effectively to editorial feedback from peers, instructors, and/or supervisors through successive drafts and revision.** *[translation of requirement in AHCCC report into an additional goal to aid implementation of faculty approved AHCCC report. AHCCC report specifies "in English" for this goal.]*			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Demonstrates **effective incorporation of constructive criticism** from peers and instructors in **successive drafts** and evidences **self-editing and revision without prompting**. Improvement evident in successive drafts resulting in an **outstanding final work.**	Demonstrates **effective incorporation of constructive criticism** from peers and instructors in successive drafts. Improvement evident in successive drafts resulting in a **good final work**.	**Satisfactorily responds** to constructive criticism from peers and instructors in successive drafts. Improvement evident in successive drafts resulting in a **satisfactory final work.**	**Does not** incorporate feedback, or does not submit revised work. **Final work is unsatisfactory.**

WCd

GOAL t - *Student is able to…* **Communicate effectively in modes appropriate to a discipline or area of inquiry.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Addresses topic at an **advanced, professional level**; communication is **well-argued, effectively presented, and free of** word-choice, grammar, spelling or organizational **errors.** **Accurately and effectively employs relevant discipline-specific format and terminology. Jargon and complex terms and concepts are well-defined and appropriate to the targeted audience.**	Addresses topic **soundly and effectively**; communication is well-argued and **largely free from** word-choice, grammar, spelling or organizational **errors**. **Employs relevant discipline-specific format and terminology. Terms and concepts are generally defined and appropriate to the target audience**.	Addresses topic and **satisfactorily** adheres to the format prescribed by the course. Communication presents a **coherent narrative, exposition, or argument.** **Uses discipline-specific format and terminology with an awareness of the intended audience.**	**Does not** address topic, or does so in a way that is uninformative, inaccurate, and/or misleading. Communication is confusing and contains numerous errors. **Fails to** use appropriate discipline-specific format and terminology; fails to communicate effectively to the intended audience.

GOAL u – *Student is able to…* **Evaluate and critically assess sources and use the conventions of attribution and citation correctly.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Demonstrates a **sophisticated ability to access** appropriate sources/data **and critically assess** their authority, reliability, credibility, and possible bias and the credentials of the authors(s) and publisher(s) – electronic or otherwise. Cites a **comprehensive range** of relevant and appropriate sources, and **accurately applies appropriate conventions** for attribution and citation.	Demonstrates **strong ability to access** appropriate sources/data **and critically assess** their authority, reliability, credibility, and possible bias and the credentials of the authors(s) and publisher(s) – electronic or otherwise. Cites **relevant sources**. **Applies appropriate conventions** for attribution and citation.	Demonstrates **satisfactory ability** to access appropriate sources/data **and critically assess** their authority, reliability, credibility, and possible bias and the credentials of the authors(s) and publisher(s) – electronic or otherwise. **Satisfactorily cites sources using appropriate conventions** for attribution and citation.	**Demonstrates little ability** to access appropriate sources/data and critically assess their authority, reliability, credibility, and possible bias and the credentials of the authors(s) and publisher(s) – electronic or otherwise. **Fails to** cite sources and apply appropriate conventions for citation and attribution.*
*Cases of suspected plagiarism should be reported to the department undergraduate chair and/or Judicial Affairs in the Office of the Dean of Students. http://judicialaffairs.rutgers.edu/			

GOAL v – *Student is able to…* **Analyze and synthesize information and ideas from multiple sources to generate new insights.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Provides **sophisticated evaluation and critical assessment** of evidence/ data, arguments, and counter-arguments drawn from multiple sources. **Artfully uses** this analysis in advancing thesis or for placing hypothesis testing in appropriate context. **Insightfully explores** larger implications and connections; **demonstrates original thinking**; **explicates limits** of findings.	Provides **strong evaluation and critical assessment** of evidence/data, arguments, and counter-arguments drawn from multiple sources. **Successfully uses** this analysis in advancing thesis or for placing hypothesis testing in appropriate context. **Explores** larger implications and connections; **demonstrates critical thinking**; **identifies limits** of findings.	Provides **satisfactory evaluation and assessment** of evidence/data, arguments, and counter-arguments drawn from multiple sources. **Satisfactorily incorporates** this material. **Notes** implications, connections, and limits of findings.	**Fails to** provide evaluation and assessment of evidence/data, arguments, and counter-arguments drawn from multiple sources. **Little or no** attention to implications, connections, and limits of findings.
*Cases of suspected plagiarism should be reported to the department undergraduate chair and/or Judicial Affairs in the Office of the Dean of Students. http://judicialaffairs.rutgers.edu/			

Cognitive Skills and Processes

Quantitative and Formal Reasoning (6 credits). *Students must meet 2 goals.* [QQ, QR]

QQ

GOAL w – *Student is able to…* **Formulate, evaluate, and communicate conclusions and inferences from quantitative information.**			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Effective and insightful selection and presentation of a range of quantitative information. **Formulates well-justified** conclusions/inferences from the data at a high level of specificity and sophistication. **Engages in extensively critical analysis** of the conclusions/inferences including discussion of tests of validity and scope. Presentation is **analytically precise, persuasive, and thorough.**	**Appropriate** selection and presentation of relevant quantitative information. Draws a **reasonably-justified** conclusion/inference from the data. **Identifies** basic strengths and weaknesses of the conclusions/ inferences noting concerns about validity and scope. **Clearly and correctly** presents conclusions and inferences.	**Satisfactory selection** and presentation of relevant quantitative information in adherence with standards conveyed in the course. **Draws** conclusions/inferences from the data, **noting appropriate concerns** about validity and scope. **Satisfactorily** presents conclusions and inferences.	**Fails to** select and present relevant quantitative information in adherence with standards conveyed in the course. **Fails to** draw, or critically assess, logical conclusions/inferences from the quantitative information.

QR

GOAL x – *Student is able to…* **Apply effective and efficient mathematical or other formal processes to reason and to solve problems.**				
	OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Symbolization : The ability to convert a problem into a setting using symbolic terminology	**Describes** the relevant quantities or variables in the problem. **Labels** all the relevant quantities in the problem; uses the area's mathematical/symbolic terminology correctly.	**Labels** all the relevant quantities in the problem; uses the area's mathematical/symbolic terminology correctly.	**Satisfactorily labels** all the relevant quantities in the problem; uses the area's mathematical/symbolic terminology correctly.	**Fails to** label all the relevant quantities in the problem or uses the area's mathematical/symbolic terminology incorrectly.
Relationships : The ability to connect quantities and find relationships among symbolic quantities	**Verbally connects** quantities and finds relationships among symbolic quantities. Provides **complete and accurate visual representations** of relationships among symbolic quantities that reveal key relationships.	Provides **complete and accurate visual representations** of relationships among symbolic quantities that reveal key relationships.	Provides **satisfactory visual representations** of relationships among symbolic quantities that reveal key relationships in accord with specific course directives.	Uses **irrelevant** information in trying to set up the problem; relies on visual representations that are **misleading**; **neglects** fundamental connections and relationships.
Formulation: The ability to construct an appropriate symbolic framework	Structures the problem in a **novel** way or selection shows a **sophisticated understanding** of relevant conventional frameworks.	**Identifies a relevant** conventional framework for the problem.	**Satisfactorily adopts** a relevant conventional framework for the problem from the course materials.	**Fails to** employ a symbolic framework for the problem.
Analysis: The ability to carry out algorithmic and logical procedures to resolution	**Elegantly carries out** a logical sequence of algorithms and procedures; uses symbolic operational rules and performs computational steps correctly.	**Carries out** a logical sequence of algorithms and procedures; uses symbolic operational rules and performs computational steps correctly.	**Satisfactorily carries out** a logical sequence of algorithms and procedures; uses symbolic operational rules.	**Fails to** follow an appropriate algorithm or mathematical procedure to completion; makes serious computational errors.
Interpretation : The ability to draw valid conclusions from numeric/symbolic evidence	**Draws insightful, valid, well-stated, and well-justified conclusions from the symbolic/numeric solution.**	**Draws valid clear and reasonably-justified conclusions from the symbolic/numeric solution.**	**Satisfactorily draws valid conclusions from the symbolic/numeric solution**.	**Fails to** draws conclusions from the symbolic/numeric solution.

Cognitive Skills and Processes –

ITR: Information Technology and Research (3 credits) *Students must meet one goal.*

GOAL y – *Student is able to…* **Employ current technologies to access information, to conduct research, and to communicate findings.** ["conduct research" includes data generation]			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Skillfully employs technologies to access information, research an issue or test a hypothesis, and communicate findings and **makes effective and efficient choices.** Demonstrates a **sophisticated understanding** of the strengths and limitations of a particular technology (or methodology the technology allows). **Correctly identifies** what types of problems or tasks it is suited to and which it is not, and why.	**Efficiently employs** appropriate technologies to access information, research an issue or test a hypothesis, and communicate findings. **Identifies** the strengths and limitations of a particular technology (or methodology the technology allows). **Correctly identifies** what types of problems or tasks it is suited to and which it is not.	**Satisfactorily employs** appropriate technologies to access information, research an issue or test a hypothesis, and communicate findings as directed by the course. **Satisfactorily recounts** the strengths and limitations of a particular technology (or methodology the technology allows). **Satisfactorily identifies** what types of problems or tasks it is suited to and which it is not.	**Does not** employ appropriate technologies to access information, research an issue or test a hypothesis, and communicate findings. **Cannot identif**y the strengths and limitations of a particular technology (or methodology the technology allows) **nor identify** what types of problems or tasks it is suited to and which it is not.

Goal z – *Student is able to…* **Analyze and critically assess information from traditional and emergent technologies.** ["information" includes data]			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Thoroughly and skillfully assesses the credibility, timeliness, relevance, completeness, and value (significance) of information or source of information (author and publisher) accessed through traditional and emergent technologies. When **assessing** statistical and scientific research, **applies** standards of replicability, falsifiability, and generalizability.	**Critically assesses** the credibility, timeliness, relevance, completeness, and value (significance) of information or source of information (author and publisher) accessed through traditional and emergent technologies. When **assessing** statistical and scientific research, **identifies** standards of replicability, falsifiability, and generalizability.	**Satisfactorily assesses** the credibility, timeliness, relevance, completeness, and value (significance) of information or source of information (author and publisher) accessed through traditional and emergent technologies. When **using** statistical and scientific research, **satisfactorily identifies** standards of replicability, falsifiability, and generalizability.	**Fails to** assess the credibility, timeliness, relevance, completeness, and value (significance) of information or source of information (author and publisher) accessed through traditional and emergent technologies. When invoking statistical and scientific research, **fails to identify** standards of replicability, falsifiability, and generalizability.

Goal aa – *Student is able to…* **Understand the principles that underlie information systems.** ["information systems" may include technological, biological, and social systems]			
OUTSTANDING	GOOD	**SATISFACTORY**	UNSATISFACTORY (D/F)
Fully describes principles employed in organizing and storing data and information by different systems (may include technological, biological, and social systems). Provides a **sophisticated discussion** of the implications of different organizational principles used by information systems for access to and accessibility of information, and the personal and social issues raised.	**Describes principles** employed in organizing and storing data and information by different systems (may include technological, biological, and social systems). **Discusses some implications** of different organizational principles used by information systems for access to and accessibility of information, and the personal and social issues raised.	**Satisfactorily describes** principles employed in organizing and storing data and information by at least one system (may include technological, biological, or social systems). **Identifies implications** of a set of organizational principles used by an information system for access to and accessibility of information, and the personal and social issues raised.	**Does not describe** principles employed in organizing and storing data and information by at least one system. **Fails to** identify implications of a set of organizational principles used by an information system for access to and accessibility of information, and the personal and social issues raised.

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