



INSTRUCTIONAL SPACE PROGRAMMING GUIDE

REQUIREMENTS FOR STANDARD UNIVERSITY-CONTROLLED CLASSROOMS

June 23, 2008 Version 1

Introduction

As noted in many University publications, Rutgers was chartered in 1766 and has a unique history as a colonial college, a land-grant institution, and a state university. This history is reflected today in classroom buildings located on the campuses in Camden, Newark and New Brunswick, where we teach more than 50,000 students each year. Given the diversity of our campuses, the various ages of our buildings, and the special space and resource requirements of many of our educational programs, Rutgers has a wide range of classroom facilities, each serving our educational mission. Because of this diversity, the guidelines produced here are not meant to mandate a “one-size-fits-all” model of design, but to respond to the instructional needs of faculty and the maintenance challenges faced by staff on all three campuses as we improve the educational experience of all of our students.

While some of the administrative structures differ on the Camden, Newark and New Brunswick campuses, the pedagogical needs of the instructors throughout the University do not substantially differ. Thus, these guidelines are University-wide and applicable to university-controlled, centrally-scheduled instructional spaces. These general purpose classrooms serve a wide range of departments and are sufficiently flexible to serve the needs of many different pedagogies.¹

This document is prepared and updated by the Classroom Renovation Committee, a standing committee that includes faculty, staff, and students; the committee was first assembled and given its charges in September 2007.² Committee members are appointed by the office of the Executive Vice President for Academic Affairs and serve for three-year terms.

¹ Rutgers also has proprietary classrooms for departments; these are scheduled by the departments and are dedicated to the needs of certain programs. Examples include art studios, laboratories, and certain departmental computer labs. All classrooms should follow these guidelines, whether they are centrally scheduled or not.

² As its name suggests, the Classroom Renovation Committee was formed to oversee renovations of classrooms. In fact, the committee’s mandate is larger, and includes the longer term goals described on page 4 of this document. The Classroom Renovation Committee was formed in 2008; the committee is indebted to the New Brunswick--

The purpose of the Instructional Space Programming Guide is to record the basic requirements for classrooms at Rutgers. Programming, in this case, refers to a collective decision as to what we want within our instructional spaces and what we want to make possible in the design of future classrooms to be constructed on our campuses. We intend for this Programming Guide to be used by architects who are engaged in renovating older buildings and constructing new buildings, and as a reference for faculty and staff. The Programming Guide will give instructors a clear and concise outline of what features may be found in every Rutgers classroom. It is hoped that faculty and staff will approach the Classroom Renovation Committee with ideas for improvements, and these innovations will then be included in subsequent versions of the Programming Guide.

Many of the topics covered in this Programming Guide are handled in more technical terms in the Rutgers University Design Standard Manual (<http://facilities.rutgers.edu/fpa/Design/designstandard.html>). The Design Standard Manual, however, does not contain programming information and is not specifically related to classrooms and their use. It is not the intention of this document to repeat the technical information in the Design Standard Manual, but rather to provide a short, readable programming guide for the many people involved in the design, construction, and renovation of instructional spaces at Rutgers.

Roles and Responsibilities

To provide efficient classroom support, the following roles and responsibilities have been established:

Rutgers-New Brunswick

Office of Undergraduate Education

- Scheduling and Space Management. This office manages the scheduling of instructional spaces on the New Brunswick campus.
- Enhanced Classroom Support. This office manages all data, audio, and visual equipment (e.g., digital projectors, microphones, DVD players; renovations, repairs, and installation parameters for this equipment) for classrooms on the New Brunswick campus.³

Rutgers-Camden

Classroom scheduling in Camden is the responsibility of the Registrar's office. The enhanced classrooms are supported by the Camden Computing Services.

Rutgers-Newark

Classroom committee, whose members worked for many years to improve classrooms at Rutgers-New Brunswick. In 2008, the New Brunswick-Classroom Committee was absorbed into the Classroom Renovation Committee.

³ Instructional technologies for student centers and libraries on the New Brunswick campus are not handled by this office; they are handled by the library and student centers directly.

At Rutgers-Newark, the following departments and committees oversee classroom design and maintenance.

- Instructional Facilities Committee
- Physical Plant (www.newark.rutgers.edu/ppnewark)
- Office of Academic Scheduling (<http://scheduling.newark.rutgers.edu>)
- Office of Academic Technology (<http://oat.newark.rutgers.edu>)

On all three campuses

University Facilities

- repairs and maintains instructional spaces
- renovates older instructional spaces
- supervises the construction of new instructional spaces
- is fully responsible for heating, ventilation and air conditioning of instructional spaces⁴

Office of Information Technology

- provides network capability (hardwiring or wireless networking)
- assists groups responsible for classrooms and instructional technology by looking at current practices, user demand, and the impact of technology and trends on both these areas

Classroom Renovation Committee

- communicates instructional needs to University Facilities and the Office of Information Technology
- guides University Facilities as to the programming of classrooms in terms of both current and future needs
- guides University Facilities in the ever-changing technological requirements of instructors
- advocates for instructors and clarifies their technological needs
- plans and recommends budgets for future improvements
- performs ongoing assessment of instructional spaces

Codes and Code Compliance; Green Purchasing Standards

The following basic principles are stated at the beginning of this Programming Guide and apply in all cases:

- New construction and renovation projects will meet all applicable codes. These codes include the Americans with Disabilities Act, the New Jersey Uniform Construction Code, Uniform Fire Code of New Jersey, EPA regulations, etc. Links to all applicable codes are available on the University Facilities website, <http://facilities.rutgers.edu/fpa/Design/02revisions/DS2PART01A-02.pdf>.

⁴ Unfortunately, most complaints about instructional spaces at Rutgers New Brunswick refer to failures in the heating, ventilation and air conditioning systems, systems which lie beyond the influence of the Classroom Renovation Committee.

- Classroom renovations and new construction will follow the Rutgers Green Purchasing Guidelines. The Green Purchasing guidelines will also govern the disposal and/or recycling of classroom parts. More information at <http://purchasing.rutgers.edu/green/>

Types of Instructional Spaces

There are four types of university-controlled, centrally-scheduled instructional spaces at Rutgers:

1. **Auditoriums:** banked rooms (with a sloped floor) with more than 250 seats
2. **Lecture Halls:** rooms with 100 to 250 seats; some are banked, others are tiered, and others are flat
3. **Mid-sized Multi-use Classrooms:** rooms with 100 or fewer seats
4. **Seminar Rooms:** small rooms intended to facilitate discussion with approximately 25 seats

Requirements for Renovation and New Construction

Acoustics

- Students should be able to hear the instructor and the audio presentation clearly from every seat
- The rear wall of auditoriums and lecture halls should have an acoustically absorbent finish
- In new construction, care should be taken to muffle noise from hallways and neighboring classrooms
- Noise levels should not exceed NC 25-30

Color Schemes

- Although decorating tastes change, especially as regards to specific paint colors, it is nonetheless recommended that at least one wall of each classroom be painted a color other than white, beige or gray. As of 2008, University Facilities recommends a choice of 5 accent paint colors; these colors may be used on the side or rear wall of any room. See appendix A for paint accent colors
- Wall paint colors must be coordinated with the flooring and, when applicable, furniture colors

Doors

- Door hardware must operate quietly and include appropriate mechanisms to muffle the sound of closing doors
- Doors with windows must include a shade to block out light from the hallway
- In new construction, a cork strip to post notices about canceled classes and other University approved information should be attached the exterior of the door

Electrical power

- Adequate power should be provided and will include:
 - an outlet for a ceiling-mounted projector or at the future location of a projector
 - electrical outlets on a dedicated ground
 - electrical outlets for instructional technology on a separate circuit from lights
 - electrical outlets for the instructor's laptop within reach of the podium or, if the room does not have a podium, within reach of the instructor's table in the instructor's area at the front of the room
 - electrical outlets should be placed in locations that allow the maintenance staff to easily clean

Flooring

- In auditoriums and lecture halls, the floor under the seats should be vinyl tile or other easily cleanable hard surface
- The aisles and the instructor's area at the front of the space may be carpeted. Carpet is not recommended for other areas of the room, such as the students' area or under seats
- Flooring decisions should take acoustics into account

Lighting⁵

- A combination of lighting zones, dimmable fixtures, and controlled daylight is ideal
- Fixtures should control glare
- Lights shall be installed in rows that are parallel to the main instructional space at the front of the room
- Lighting controls shall be located at one of the doors and in the instructor's space
- Lighting controls must be labeled
- In new construction, lighting controls shall be placed at every door and at the podium
- Instructional spaces shall have more than one lighting zone to make presentations possible; these zones must be able to be operated independently, as follows:

Zone A for Lighting: Instructor's Area

- There must be sufficient lighting on the podium so that the instructor can see to operate the equipment and read his or her notes
- Lights must be dimmable and must not create glare on the projection screen
- The chalkboard or other writing surface must be illuminated separately so that students can read what is written in the board while at the same time being able to view the screen
- Fixtures on the chalkboard must not interfere with the movement of the screen

Zone B for Lighting: Students' Area

- Larger classrooms will have more than two lighting zones. Lights in these zones must be dimmable as well, but must be operated independently of the lights in Zone A.

⁵ Movement sensors that cause lights to shut off automatically have been found to be troublesome in instructional spaces because they typically shut off during examinations. Although such sensors seem like a good idea from a sustainability point-of-view, they are not recommended at this time.

- Students require diffuse overhead lighting to read and take notes at all times, but especially when instructors are not using presentation equipment
- Lights in the students' area, Zone B, should be dimmable
- Lighting should be even across the room, with a maintained light level of 60 footcandles on work surfaces. When lights are not dimmed, this is the standard.

Internet connectivity

- Hardwiring should be provided near the instructor's table or podium. Wireless connections are not as fast as hardwiring, but are an acceptable alternative.
- Internet bandwidth should be sufficient to support audio and video projection capability.

Seating

- Generally, student seats should comfortably accommodate a wide range of body types.
- When moveable seats are used, a single classroom should have chairs of a uniform make/model and a single color. Maintenance will be required to keep the correct chairs in the correct rooms.

Seating in Auditoriums (250 seats and up) and Lecture Halls (100-200 seats):

- Fixed seating in these rooms will have attached tablets and will be bolted to the floor.
- Seats must be padded and at least 22" wide.
- Seats should be spaced a minimum of 24" on center.
- Seats should be staggered to allow for clear sight lines.
- As of 2008, the preferred manufacturers are Track Seating and Irwin Seating.
- 15% of seats should accommodate left-handed students.

Seating in Mid-size Multi-use Classrooms (under 100 seats, but not a seminar room):

- A range of seating may be used in these rooms including tablet arm chairs, tables and chairs, and fixed seating. (Fixed seating is the least desirable type of seat; however, we recognize the necessity of fixed seating in auditoriums.)
- Since these mid-size, multi-use classrooms lend themselves to group work, every effort should be made to allow for flexible seating arrangements.
- Chairs should not be bolted to the floor in any room with a capacity of 50 or less
- To achieve economies of scale, chairs should be purchased in neutral colors that will match all of the color schemes.
- In renovating older rooms, we may find it necessary to keep tablet arm chairs. If so, the seat should be 22" wide and the tablet should be at least 130 square inches in order to accommodate a laptop computer.
- 15% of the seats in such a room should suit left-handed students.

- In new construction, rooms should not be designed for tablet arm chairs. Tablet arm chairs are uncomfortable and infantilizing, and they do not suit a range of body types. Instead, continuous work surfaces (long tables) with moveable chairs will be used. Tables with affixed chairs are prohibited, again because they do not suit a range of body types.

Seating in Seminar Rooms

These rooms may take many shapes, as long as a minimum of 25 students and an instructor are able to speak to one another and see the projection screen.

- Flexible furniture (small tables, rather than one large table) is preferred. A typical configuration will be several small tables in the shape of a U, facing the projection screen.
- If budget allows, swivel chairs are preferred, as they make it possible for students to work in groups, adjust their seats to see the screen, and then turn back toward the other students.
- These rooms can offer stackable chairs to allow the chairs to be set aside, and thus allow for more elbow room during smaller classes. (Room capacity limits must include these additional chairs, however.)

Below is a rough guideline for the amount of square footage per student for the four types of instructional spaces at Rutgers:

Type of Instructional Space	Square Footage per Student	Furniture
Seminar rooms	25-30	Small tables and movable chairs
Mid-size Multi-use Classrooms	20-25	Continuous work surfaces (tables) and movable chairs; tablet arm chairs when necessary
Lecture halls	15-20	Tablet arm chairs when necessary; fixed seating
Auditoriums	15-20; and/or seats spaced with a minimum of 24” on center; minimum clearance of 21” between tablet arm supports; minimum 12” clearance between tablet arms in use and seat backs	Fixed seating

Sight lines and screens

- The projection screen and other presentation surfaces (e.g., chalkboards) must be visible from every seat in the room
- The projection screen, when lowered, must not entirely obscure the chalkboard. Sufficient chalkboard space must remain when the screen is lowered. Regrettably, there

may be some overlap of screens and chalkboards in older rooms. In new construction, the screen and the chalkboard should be able to be used simultaneously.

- In some circumstances, such as in rooms with very high ceilings, the screen can be mounted above the chalkboard.
- The podium should not block the students' view of the instructor, screen or chalkboard.
- Screens should be located far enough away from the front row of seats so that students in that row can see the screen; typically this distance will be equal to the width of the screen, and in larger rooms the distance should be 1.5 times the width of the screen.
- For auditoriums and lecture halls, the lower edge of the screen should be at least 5 feet above the floor.
- Manual screens (not electrically operated) should be avoided in new construction.

Signage⁶

- Building signage should be designed so that users are directed to classrooms from main entrances and other central circulation points, such as elevator lobbies and stairwell landings.
- The capacity of all rooms shall be posted.
- Doors of all instructional spaces must be marked with the room number.
- Signage that indicates how to report problems should be posted in the instructor's area in front of the classroom. Signs should make clear that there are different contact numbers for maintenance problems (University Facilities) and for technological problems (Enhanced Classroom Support).

Windows and window treatments⁷

Although there is too great a range of window types at Rutgers to dictate any one type of window treatment, some general standards still apply:

- Windows should not cast daylight onto presentation surfaces.
- All windows should have substantial light-blocking window treatments. Blinds are preferred; curtains are not recommended.
- In rooms used heavily by cinema studies instructors and instructors in related disciplines, the window treatments should allow for near total darkness.⁸
- In new construction, windows should be double-glazed.
- In new construction, there should be no windows on the front wall of a classroom.

Enhanced Classrooms

There are several levels of enhanced classrooms⁹ on the Rutgers-New Brunswick/Piscataway campus. These are described here: http://classrooms.rutgers.edu/levels/levels_PDF10061.pdf

⁶ Additional information on signage at Rutgers may be found in the Interior and Exterior Signage Standards Manual at <http://facilities.rutgers.edu/fpa/Design/EISManual.html>. This document was written in 1999.

⁷ Limited information on windows and doors may be found in the Rutgers Design Standards, Part III, Division 8, <http://facilities.rutgers.edu/fpa/Design/02Revisions/DS2DIV08A.pdf>. This document was written in 2000.

⁸ At the moment, the following rooms are used by instructors teaching film, media and other related disciplines, but other classrooms may be added in the future: Milledoler 100, Murray 301, Ruth Adams 001.

Designers should know the intended level of the classroom before construction or renovation, and make sure that power sources, sightlines, and podium access are considered.

Generally, however, enhanced classrooms at Rutgers will include:

- fixed data/video projection capability, typically mounted on the ceiling
- internet connectivity (wireless or wired, with a preference for hard wiring because of its increased speed)
- a user-friendly laptop interface on the podium
- a standardized operating protocol familiar to Rutgers faculty
- a podium that allows for connection from iPhones, iPods, and other hand-held devices
- flexible growth potential and the ability to interface with new devices
- microphones that allow instructors to move around the room
- a sound system (speakers) appropriate to the size of the room

At Newark, Enhanced Classrooms are managed by the Office of Academic Technology (<http://oat.newark.rutgers.edu>). Podiums at Newark have been installed in the front of each instructional space to house the technology:

- Networked Computer
- Projector
- DVD/VCR Combo
- Document Camera
- Laptop Connection
- USB Port for Flash Drive Access
- Control Panel to switch between displays

Some, but not all, **Newark** instructional spaces contain the following equipment:

- Wireless Microphone
- Personal Response Systems (Clickers)
- Automated Podcasting Equipment

A description of enhanced classrooms at **Camden** may be found here:
http://computing.camden.rutgers.edu/smartclass/smart_manual.php

General comments

- All furniture, window treatments, and flooring materials should be durable. People unfamiliar with heavy use of instructional spaces may not fully understand the necessity of durability. Some Rutgers classrooms support as many as 10,000 students per week; many are in operation from approximately 8AM to 10PM.

⁹ Please note that we recommend avoiding the term “Smart Classroom,” as it led to confusion and no small amount of ridicule.

- Instructors require a table strong enough to sit on, a chair, and a lectern at the front of the instructional space. The table should be approximately 24” by 60” and should not have casters.
- Many instructors use a chalkboard as well as a screen, so both should be visible from all seats.
- A clock with an automatic reset for daylight savings time should be posted on the back or side wall of the room.
- Two coat hooks, one for a coat, the other for a bag, should be provided in the front corner of each instructional space.
- Seminar rooms do not require instructor furniture.
- Each classroom should have a trash bin, a recycling bin for paper, and a recycling bin for bottles and cans.
- The Rutgers visual identity system should be introduced, in a subtle way, in the renovations of instructional spaces and new construction. Students and visitors should know they are in a Rutgers classroom.
- Bulletin boards are not needed inside instructional spaces, as they are present in hallways and lobbies. Bulletin boards should be removed during renovation and not included in new construction. In common areas outside instructional spaces, such as hallways and lobbies, bulletin boards are encouraged.
- Chalkboards are preferred over marker boards (white boards), even in new construction. The chalk rail should extend the length of the chalkboard.
- Built-in chalkboards, especially those made of slate, such as the ones in Ruth Adams or Murray Hall, will be repaired and maintained, as they are integral to the historic character of the buildings and could not be replaced with new chalkboards of equal quality.

Additional Recommendations for New Construction

These are desirable qualities that are unlikely to be achieved during renovation of existing facilities:

- Whenever possible, instructional spaces should be located on the entrance level. When classrooms are located on upper levels, care must be taken to provide space for large numbers of students to circulate in and around the building.
- Instructional spaces should be sheltered from noise-generating areas such as mechanical rooms, elevators, vending machines, and restrooms.
- Designers should move away from the concept of an instructor standing at a podium in a fixed position at the front of the room. Many instructors move around the room as they lecture, and thus they need to be able to see the screen as well as the students.
- Stages are not needed. Many instructors dislike speaking from a stage, as it sets up an unnecessary distance from the students; if they are particularly active lecturers, they worry about falling off the stage. In such cases, they stand on the floor in front of the stage, and the stage becomes wasted space.
- Minimum ceiling height will be 10 feet; in large, sloped or tiered classrooms, the ceiling height will be measured from last row of seats.
- Hallways and corridors should be designed to provide common areas for social interaction in addition to serving basic circulation functions; these areas should be

furnished with soft seating with tablet arms, wireless hot spots, and appropriate lighting for reading and computer work.

- New classroom buildings should contain spacious lobbies.
- New classroom buildings should include a café.
- Doors should be located at the back of mid-size multi-use classrooms to prevent latecomers from walking directly into the instructor's area.
- An increased number of instructors are using personal response technology (clickers). A uniform standard should be developed for all three campuses.

Acknowledgements

The Classroom Renovation Committee dedicated many hours to writing these guidelines. The committee members' duties during the 2007-2008 academic year were particularly time-consuming, as they were tasked with setting priorities for a major classroom bond in addition to writing these guidelines. The members of the committee in 2007-2008 were:

Carla Yanni, Chair of the Classroom Renovation Committee, Professor of Art History, SAS, NB, and Office of Undergraduate Education, NB

Michael Beals, Professor of Mathematics, SAS, NB, and Vice-Dean for Undergraduate Education, SAS, NB

Magda Comeau, Green Purchasing and Procurement Compliance Manager, University Procurement

Joe Delaney, Associate Director of Information Technology, CTAAR, NB

Christopher Dougherty, Associate Dean for University College and Director of EOF, Arts and Sciences, Camden

Ghislaine Darden, Manager Facilities Special Projects/Communication, University Facilities

Bernice Ginder, University Director and Deputy CIO, OIT

Christopher Hack, Senior Project Architect, University Facilities

Cindy Hmelo-Silver, Associate Professor of Education Psychology, Graduate School of Education

Wael Kanj, Class of 2011, Engineering Governing Council

Kevin Lyons, Director of Purchasing, University Procurement

Arun Mukherjee, Director of Scheduling and Space Management, Office of Undergraduate Education

Elizabeth Rowe, Director of Summer Sessions and Academic Scheduling and Office of Academic Technology, Newark

Joshua Slavin, Class of 2010, Livingston Campus Council

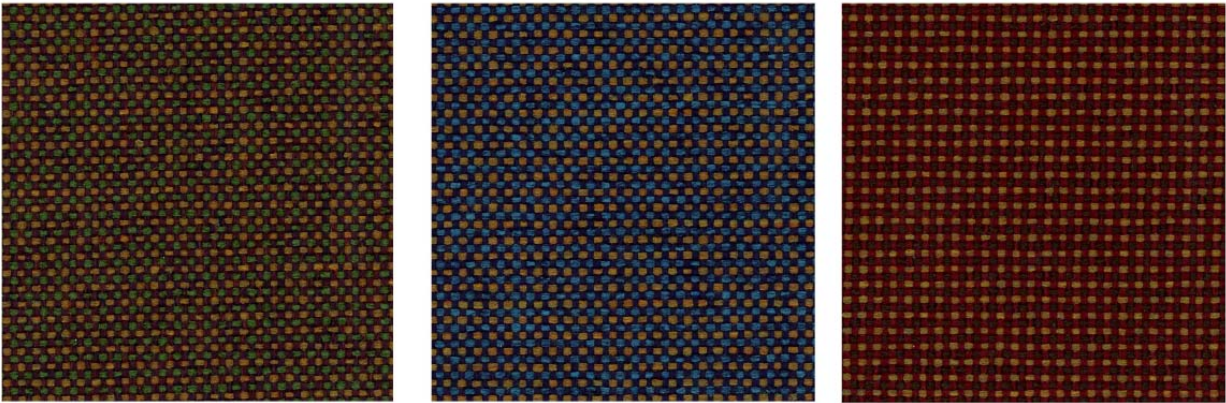
Randy Smith, (David R. Smith); Associate Professor of Sociology, SAS, NB

Tom Stephens; Professor of Spanish and Portuguese, SAS, NB

Lea Stewart, Professor of Communication, SCILS and Campus Dean for Livingston, NB

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Appendix A
Color Scheme



CHAIR FABRIC



FLOOR TILE



ACCENT WALL COLORS