University of Florence

School of Architecture

ICAD – INTERNATIONAL COURSE ON ARCHITECTURAL DESIGN
ARCHITECTURE AND ENVIRONMENT LAB
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Prof. Giuseppe Ridolfi

ARCHITECTURAL DESIGN III
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Educational objectives

In light of the now widespread awareness that design requires complete appreciation and understanding of the meaning of "environmental sustainability," and the universal acceptance of the concept of "sustainability" — as seen first in the Shanghai Expo in 2010, called "Better cities, better life," and then with the Milan Expo (May 2015), "Feeding the Planet, Energy for Life" — the course has the primary objective of exploring this issue, delving into important developments in this area in the contemporary scene.
Buildings must be built with consideration for the environment in which they will be set and responding to the specific social needs that currently pertain first and foremost to the habitat, energy consumption and the emissions the buildings produce. This is clearly not a passing trend but a need in response to a genuine environmental emergency requiring all countries to drastically reduce greenhouse gases, a third of which are produced by human activities connected to housing.
The belief has finally become widespread, in building and architecture as well, that every human action has an effect on the community. Activities related to "building" must, therefore, take on specific responsibilities that require everyone involved to carefully adhere to these criteria, methods, and products that let us work consciously in harmony and with respect for the environment.

The course is highly multidisciplinary, bringing into relationship different realms such as architectural, environmental and landscape design, history and restoration of historical centers, energy analysis, assessment of economic and environmental impact, innovative technologies, building technologies, and new materials, as well as new building techniques.

The Lab is organized with an “on the job” approach to make it dynamic and engaging; classroom lectures are limited in favor of seminars and application exercises. Within the span of a semester, most educational activities will be in the classroom and focused on devising and developing the final project.

Design theme:

Development of a building to be used as library and multipurpose structure

The goal of the Architecture and Environment Lab's design exercise is to guide students in developing design ideas for the New Castel Maggiore public Library, in the surroundings of Bologna.

According to the guide lines included in the bid of the competition promoted by the Municipality of Castel Maggiore, the students who will follow the course will be asked to design a new building that will be aimed to be used as a library and that will also include the Municipality Council Chamber and multi-purpose halls, in order to become a highly representative building that will be able to transmit culture in all its forms, capable of matching the needs of information and general consultation; a connecting tool between needs of the daily life, of the information society and of the trasmitting, trying to create a cultural service capable of intercepting not only the needs of study and information of the urban users, but that has to become a point of reference for all Citizens and that may be proposed as a place where it is pleasing to go to the current library and finding entertainment."

During the lab, students will have the chance to take on the challenge of a real competition, and they will be asked to respond to its planning requirements, respecting deadlines and following the guidelines to best design flexible spaces, capable to create interaction between outdoor and indoor by “projecting the building in the several visions, social as well as cultural.”

The building must host a library of about 700 sqm. conceived according to the concept of *open library*, the room for design activities and exhibitions will be of 200 mq. with independent access, but connected to the library. There will also be a Council Room of 130 sqm. and a multipurpose space of 130 sqm. to hold up to 100 people with outstanding acoustic requirements. Two rooms of about 30 sqm. are expected to be design and each one with direct access from the outside.

Program:

The course's duration is an academic semester for a total of 144 hours (48+48+48), for which enrolled students receive 18 (6+6+6) academic credits.

All the course's activities require participation and students must have 80% attendance in order to be eligible for the mid-semester evaluations and the final exam.

1st STEP / Introduction to the Workshop's theme
Introduction to the design theme, explanation of the ideas' competition and enrollment of students in the Lab.
Organize work groups, each of which will consist of 2 or (at most) 3 students.
Organize work to build a general model of the project area, to be done as a group in the classroom by students enrolled in the Lab.

2nd STEP / Building type analysis
Delivery of building type analysis, focused on the history of the school/educational building since its origins, through an in-depth consideration of case studies in which students will identify important moments in historical and contemporary buildings in Italy and the world.
The analysis will be delivered with a full presentation, supported by projected images, which each work group will give in the classroom for the teachers and other students.
> Weekly meeting with teachers to review work progress.

3rd STEP / Context analysis
Delivery of historical, landscape, urban planning, and sociological analysis of project area for an in-depth study of the context where the new school complex is to be located; on a regional level, on a municipal level about Follonica, and with a specific study of the area in which the project is set.
The analysis will be delivered with a full presentation, supported by projected images, which each work group will give in the classroom for the teachers and other students.
> Weekly meeting with teachers to review work progress.

4th STEP / Master plan
Each work group will develop a master plan; the design of an architectural structure requires a prior general design and/or redevelopment of the project area within which the school complex is set. Particular focus will be given to designing outside landscaped areas and the system of roads and entrances to the new complex.
> Weekly meeting with teachers to review work progress.
> Delivery of the master plan, preparing two A0 charts that each work group will present to the teachers and other students in a classroom projection.

5th STEP / Concept Design and Final Design
Development of architectural structure by each work group in all scales needed for the project, following the design steps of the Concept Design and then the Final Design.
> Weekly reviews with teachers of work progress, with special focus on architectural quality and integration of energy, building system, structural, and technological aspects in the design.
> Delivery of the master plan, preparing two A0 charts that each work group will present to the teachers and other students in a classroom projection.

6th STEP / Final exam — Presentation of competition materials and awards
Delivery of materials required by the Lab competition; final graphic representation of the design, summarizing all design steps with complete architectural drawings at the various scales needed to clarify the proposal: historical / urban context analysis, master plan at 1:1000 scale, design concept and general site plans at 1:500 scale, functional diagrams, distributional layout, floor plans, elevations, sections at 1:200 scale with close-up points at scale 1:100, construction details at 1:50, materials overview, views and photo montages, model.

The competition specifically requests:
- N. 10 boards in A0 format
- model to 1:500 scale (to be included in the general model)
- model in a 1:200 architectural scale
- illustrated report in A4 format of at least 20 pages including the cover
- CD with charts in PDF format, and the report in PDF format

The jury is made up of the Lab's head teachers and possible outside figures. After it has completed deliberation, the winning, second and third place designs will be chosen, as well as several honorable mentions, and each student will receive an evaluation as the results of the final examination.

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University of Florence

iCAD International Course on Architectural Design

Architecture and Environmental Design Lab

Environmental Control Techniques 6 CFU

Syllabus

Spring Semester 2018

Prof.C Lorenzo Giorgi

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Personal: 366/4527157

Class Location: room 08, S. Teresa, Via della Mattonaia 14, Florence IT

Class Schedule: Tuesday 08:45 am: 12:45 pm

Core Areas of Study

Fundamentals of Building Physics, Integrated View of Green Buildings, Fabric of Buildings, Services and Environmental Technologies, Control System Techniques

Introduction

The practice of *building energy performance assessments* has become compulsory in Europe after the issue of the European Directive, titled: "Energy performance of buildings" (EPBD, European Union 2003)

The EPBD sets energy performance requirements for new buildings and for existing buildings subjected to major renovation and establishes that: "when buildings are constructed, sold or rented out, an energy performance certificate has to be made available to the owner or to the tenant"

Briefly, this European Directive, concerns about: the amount of energy consumed or estimated to satisfy all the needs of the building (heating, hot domestic water, cooling, ventilation, lighting). As a consequence, extensive research activities, both at national and international levels, have been carried out to create a general framework for calculation methodologies of the building energy performance.

Following the issue of the European Directive on the "Energy performance of buildings" extensive international initiatives have been promoted toward the elaboration and the adoption of standards containing common methodologies for building energy performance assessment.

Starting from this regulatory framework, the course will introduce a further validation, needed to apply these computational methods, to different building typologies and to different climatic conditions, including the comparison with detailed simulation methods as well.

In this contest, several standards, methods and software applications had been developed in relation of the definition of energy ratings based on: measured energy (operational rating) and/ or on the computation of the method itself (asset rating). The accuracy of the calculation methodology (simplified or detailed), the discrepancy between new or existing buildings, the layout of the energy performance certificate, the mutual relation between energy performance and indoor environment quality (in terms of thermal and visual comfort and IAQ), all these aspects are enhancing and standardizing new Environmental Control Technique practices, making this field, nowadays a crucial juncture, between the project and its feasibility.

Course Contents

Environmental Control Techniques can be defined as the process to address surrounding environmental parameters with respect of devising plans, programs, policies, buildings, or products. Environmental Control Techniques can also refer to the applied sciences dealing with creating the human-designed environment. These fields include and, quite often, interconnect architecture with natural sciences, geography and physics, underlying thermal theories and thermodynamic principles and focus on design that enhances the building environment and minimizes the impact on the world's environment.

The course program handles the learning process required to obtain a consistent knowledge over the practice of *environmental control techniques* toward the accomplishment of a project driven by a strong architectural design for the production and management of buildings, urban spaces and infrastructures. The class attention will be focused on building requirements in terms of: controlled

environments, well-being, climate control systems, resource consumption; all these aspects will be offered to supply students of investigating opportunities through specific design considerations, related to the built environment, as well as problem solving tools. The course aims to enhance a learning environment in which students will explore the relationships between architecture, environment, technology, engineering and craft, and how they interact to improve human conditions.

Semester activities will provide the means of support to assess capabilities and contributions that building products make to conservation and to the overall consumption of energy, introducing students to the practice of: Building Performance Simulation (B.P.S).

The course, combining detailed methods calculation procedures and other energy performance-related standards, will let participants to the understanding and to the control of several aspects of a study case, such: judging compliance with regulations expressed in terms of energy targets (via the design rating); comparing the energy performance of various design alternatives; displaying a standardized level of energy performance of the existing building; assessing the effect of possible energy conservation measures on the existing building; predicting future energy resource needs by calculating the resources consumption of the study case itself.

Attending and participating to class activities, students will acquire methods to evaluate thermal and energy performance of buildings based on simplified method and detailed software applications (Energy Plus powered) providing the calculation procedures for system losses and efficiencies for the different energy systems, such as: space heating/cooling, lighting, ventilation and air conditioning .

Class activities, taught principles and project work will comply with contemporary regulations and will be informed by best practice.

Teaching Methodologies

The course schedule is offering a consistent set of calculation methods implementing different levels of detail: from the energy use, space heating and cooling of a building to the influence of the recoverable thermal losses of mechanical systems (HVAC).

The learning will be underpinned by scientific principles and hands-on experience through experimenting, modeling and making.

Class atmosphere will encourage students to explore, by doing and manufacturing, a various range of technologies associated to VEM (Virtual Environment Modeling) practices addressed to architectural design trough the application of detailed computational method tools. This exploration will be pursued in the context of design principles moving from the general built environment to domestic scale building technology solutions. Students will be instructed over the principles related to georeferencing basics, such: fundamental representations and expressions of geographic information, the datum, metadata managing, W.M.S. Services, geographic positioning system , georeferenced benchmark to build up a datum line, Light Detection And Ranging (Lidar) technologies and digital terrain model, interoperability between CAD and GIS software and data collector. All the above listed topics will be covered both, by lecturing and by software applications

(Quantum-Gis 2.01), to endeavor a confident management of all those environmental data (climatic, weather zones, rates etc), indispensable to create a proper setting scenario, for detailed and simplified computational methods processing.

A study case will provide the ideal vehicle for the evaluation of learning outcomes; since the project selected for the semester, will be undertaken by exploratory approaches trough a broad range of software technologies needed to energy assessments, starting from the basic concept of thermal zone modeling, analysis grid, rates setting and so on till the learning environment will be one of investigating, understanding and doing to nurture tooling attributes, necessary to build a clear idea of those computational software categories, for energy ratings (design, asset, tailored, operational). In this respect, realized models, artifacts or design drawings are expected being skillfully executed in order to be accepted.

Aims

The Course aims to provide the means of support to assess capabilities and contributions that building products make to conservation and to the overall consumption of energy, introducing students to the practice of: Building Performance Simulation (B.P.S), combining detailed methods calculation procedures and other energy performance-related standards, allowing participants to the understanding and to the control of several aspects of the study case, such: judging compliance with regulations expressed in terms of energy targets (via the design rating), comparing the energy performance of various design alternatives, displaying a standardized level of energy performance of the existing building, assessing the effect of possible energy conservation measures on the existing building, predicting future energy resource needs by calculating the resources consumption of the study case.

Learning objectives

The awareness of environmental control techniques will let students to interact with their environments, using appropriate materials and processes in response to needs, wants and circumstances. Class activities will encounter several aspects related to the concept of sustainability, part of the daily life experience of all people, at work and at leisure and students, will be equipped to face these encounters with the confidence that comes from: learning about, through and with technologies related to the build environment. The course will keep, during semester class activities, as main target the recognition by participants over the appreciation and the understanding of the complex interface between environmental control techniques and the architectural project. Learning objectives intend to build awareness over: the understanding of appropriate concepts, processes and requirements of building energy performances. Class activities will enable the ability to apply knowledge and skills by thinking and acting confidently, about: an integrated view of green buildings, energy benchmark, building service engineering, commissioning, monitoring and energy management, the capacity to evaluate technological tools, artifacts and systems critically and constructively. The learning atmosphere will encourage participants to explore technologies associated with architecture and the built environment; this process will imply to gain confidence

over the practices of the Virtual Environment Modeling and the tools for energy assessments *dynamic* and *simplified* computational methods.

This exploration will be pursued in accordance to the design principles of the general built environment as well as through specific areas addressing urban and domestic scale. The learning process will underpin scientific principles and hands-on experience through experimenting, modeling and making to get familiar with issues and principles related to these topics. The teaching approach throughout the course will be driven to achieve a proactive behavior in students by experiencing, observing and doing, all of which found a proper expression in the final examination project.

Class Outcomes

A practical centered learning project work of design, across a broad range of technologies, will provide the ideal vehicle for the evaluation of student outcomes. The classroom will have to respond properly to a challenging experience that will allow the development of a body of knowledge, understandings, cognitive and manipulative skills and competencies. Students will have to reply to the technological aspects described during the semester, integrating such knowledge and skills, together with qualities of co-operative enquiry and reflective thought and developing proper solutions. Class activities were expected to maintain high standards of Academic Honesty, the appropriation of work, ideas, words of someone else without attribution, assisting or receiving assistance during test or examination, impeding or damaging the academic work of other students, submitting the same work in more than one course, deliberate falsification and distortion were prohibited.

At the end of the semester it is expected that students will be confident with the understanding of appropriate concepts and processes of green building requirements, the ability to apply knowledge and skills by thinking and acting confidently, about: an integrated view of green buildings, energy benchmark, building service engineering, commissioning, monitoring and energy management, the ability to evaluate technological activities, artifacts and systems critically and constructively.

Practical project work of a design, exploratory and manufacturing nature will be the central frame work to the learning experience outcome.

It is expected trough the learning processes, during the semester:

To impart a balanced education, giving students a broad and challenging experience that will allow them to develop a body of knowledge, understanding, cognitive and manipulative skills and competencies and so train them to be proactive in a technological world.

To alert students to integrate such knowledge and skills, together with qualities of co-operative enquiry and reflective thought, in developing solutions to technological issues.

To supply students of investigating opportunities through specific design considerations related to the built environment, as well as design as a problem solving tool.

To enhance a learning environment in which students will explore the relationships between architecture, environment, technology, engineering and craft, and how they interact to improve human conditions.

Activities

Lecturing and class activities are offering a coherent set of calculation methods implementing different levels of detail from the energy use, space heating and cooling of a building to the influence of the recoverable thermal losses of mechanical systems (HVAC).

In this respect, the course is approaching to Building Performance Simulation (BPS) as a source of feedback in the early stages of architectural design, taking advantage of the specific affordances provided by parametric scripting for design, fine-grained data, design evolution, all of these gathered by the analysis outcome from the study case project.

ASSESSMENT, EVALUTATION AND GRADING SYSTEM

Students will receive separately evaluation in consideration of: theoretical knowledge, refinement, dedication, attention, completeness, correctness and participation. The final grade will be assigned as the average of the different evaluations.

The learning assessment will be weighted as follows:

20% attendances, class participation, group discussions, collective reviews

20% intermediary assignments

60% final examination (written Assessment Report + Students Project Final Presentation)

Attendance

Course attendance is compulsory. Please note that no flexibility is allowed when student will not take part on intensive workshop sessions.

Class policy of the course establishes that if the student is not attending compulsory classes or has collected more than two absences in normal class fails the exam.

In any case, the professor is not responsible for students who are not receiving information due to their truancy although most of the information is accessible on line.

Academic Integrity

The University's community is expected to maintain high standards of Academic Honesty and uphold Academic Honesty in his / her activities. Cases of Academic Dishonesty will be promptly reported to the Dean of Academic Affairs. The class is against plagiarism and dishonesty. Cheating, appropriation of materials from other authors without crediting them and re-using researches or

projects done in previous course without appropriate authorization is a violation of the University's code of academic integrity. The appropriation of work, ideas, words of someone else without attribution, assisting or receiving assistance during test or examination, impeding or damaging the academic work of other students, submitting the same work in more than one course, deliberate falsification and distortion are prohibited. Penalties for such violations will result in loss of credit, to fail the course and, in severe cases, to incur legal actions.

Students are invited to place clearly source references and credits in appropriate way using standard conventions.

BIBLIOGRAPHY AND RESOURCES.

References are made to International Standards and Procedures.
All learning resources and tutorials will be provided during the semester.

Course Readings

M. Bauer, P. Mösle, M.Schwarz, GREEN BUILDING - Guidebook for Sustainable Architecture, Springer – Verlag, Berlin 2010.

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B018896 - ENVIRONMENTAL DESIGN
Prof. Giuseppe Ridolfi

Course Content -
The course focuses on architectural buildings able to meet human needs while preserving environmental resources. The course teaches a comprehensive design approach concerning decision-making process delivered as a scientific research based on digital modeling in order to materialize physics, alternative solutions and acquire shareable awareness on effects. Since their impact on sustainable effectiveness Massing Optimization in the Early Stage and Building Enve-lope Prototyping will be explored.

Suggested readings -
Bibliography, reading materials, lecture integrations, tutorials to assist assignments and other resources including Syllabus and Class Schedule are available online at Mailab.biz. The student is required to access regularly the website to check news and resources update.

Learning Objectives -
Upon completion the class, students are expected to acquire knowledge, awareness and design-ing skills on:
- environment as an intra-system between humans, nature and buildings
- performance design, green metrics and energy assessment
- decision-making process based on data evidence
- performance-driven computational work-flow
- architectural mass modeling and numerical simulation of environmental conditions
- high-energy architectural envelopes and passive-energy solutions
- smart technologies and materials for sustainable architectures
- digital prototyping and industrial manufacturing of building envelopes.

Prerequisites -
Student attending the class is required to have completed Architecture and Structure Design Lab, to have a basic knowledge and skills on BIM and Computational Design, and to have her/his laptop with preinstalled 3D CAD software, raster/vector graphic programs and any other digital tools for visual communication and public presentations.
More in detail, before the class enters in the lab activities it is strongly recommended to get the educational version of software from Autodesk such as Revit, Insight 360, Flow Design, and from Trimble SketchUp and optionally Sefaira. Open Studio from Alliance for Sustainable Energy, LLC is also mandatory required. Otherwise these software, their installing guides, other free software and plug in will be provided in class. Students that don't have any experience on solid modeling are strongly recommended to get supplementary teaching courses or webinars.

Teaching Methods -

Learning is conceived as a scientific research based on computational modeling and as a craftsmanship activity where students are asked to learn and to adapt multiple tools and techniques in order to materialize, test, give evidence of their assumptions and ideas; exchange expe-riences, and acquire knowledge as well.
Therefore teaching is carried out as a fab-lab developed through in-class design assignments, case-study analysis, and assisted baseline exercises involving use of state of the art architectural modeling, energy simulation/assessment software, and CNC prototyping technology as well.
Activities are also supported by lectures, discussions, intermediate individual/collective reviews presentations, and by the Department's Architectural Models Laboratory (LMA) and MAILAB – Multimedia Architecture Interaction.

Type of Assessment -

Student work evaluation is based on attendance, and credits get during the semester. Class poli-cy establishes that if the student is not attending compulsory classes (see the Class schedule) or has collects more than three absences fails the exam. In any case, the professor is not responsible for students who are not receiving information due to their truancy.
Evaluation is expressed on the assignments' results and graded in thirty taking in consideration originality, creativity, refinement, dedication, attention, completeness, correctness:
• 30L- 29 exceptional evaluation, awarded to students whose work is outstanding
• 28-27 distinguished evaluation, awarded to students whose work is good
• 26-24 average evaluation, awarded to students whose work is adequate
• 23-18 low evaluation, awarded to students whose work is sufficient but not completely satisfying in all the aspects
• • NC «not classified», awarded to students whose work is missing or presents severe lacks.
Students failing the course need to start a new course with no credits recognized.

Course program -

Computational Materiality for Sustainable Architectures and Comprehensive Skins
With «Building System Design» (first year), this course represents the disciplinary contribution of «Technology of Architecture» to the Master. Both are focused on architectural project and compu-tational design embedding the decisional process, communication and designing as well: pro-cesses dealing with willness and facts, with "un-materiality" formalized, computed, and extracted through digital technologies in order to obtain valuable/reliable architectures.
The philosophy of the two classes is to jump over the software generated free-forms, or the preva-lent use of design technology for calculation, visualization, and rendering. Vice versa the goal is pursue a coherent and interoperable process and to promote a research attitude based on digital materiality.

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Course Outline. The course focuses on architectural buildings able to meet human needs while pre-serving environmental resources. The course teaches a comprehensive design approach concern-ing decision-making process delivered as a scientific research based on digital

modeling in order to materialize physics, alternative solutions and acquire shareable awareness on effects. Since their impact on sustainable effectiveness Massing Optimization in the Early Stage and Building Enve-lope Prototyping will be explored.

Language: English.
Methodology. Learning is conceived as a scientific research based on computational modeling and as a craftsmanship activity where students are asked to learn and to adapt multiple tools and tech-niques in order to materialize, test, give evidence of their assumptions and ideas; exchange expe-riences, and acquire knowledge as well.
Therefore teaching is carried out as a fab-lab developed through in-class design assignments, case-study analysis, and assisted baseline exercises involving use of state of the art architectural modeling, energy simulation/assessment software, and CNC prototyping technology as well.
Activities are also supported by lectures, discussions, intermediate individual/collective reviews presentations, and by the Department's Architectural Models Laboratory (LMA) and MAILAB – Multimedia Architecture Interaction.
Learning Goals. Upon completion the class, students are expected to acquire knowledge, aware-ness and designing skills on:
• environment as an intra-system between humans, nature and buildings
• performance design, green metrics and energy assessment
• decision-making process based on data evidence
• performance-driven computational work-flow
• architectural mass modeling and numerical simulation of environmental conditions
• high-energy architectural envelopes and passive-energy solutions
• smart technologies and materials for sustainable architectures
• digital prototyping and industrial manufacturing of building envelopes.

Text books. Bibliography, reading materials, lecture integrations, tutorials to assist assignments and other resources including Syllabus and Class Schedule are available online at Mailab.biz. The stu-dent is required to access regularly the website to check news and resources update.
Prerequisites. Student attending the class is required to have completed Architecture and Struc-ture Design Lab, to have a basic knowledge and skills on BIM and Computational Design, and to have her/his laptop with preinstalled 3D CAD software, raster/vector graphic programs and any other digital tools for visual communication and public presentations.
More in detail, before the class enters in the lab activities it is strongly recommended to get the educational version of software from Autodesk such as Revit, Insight 360, Flow Design, and from Trimble SketchUp and optionally Sefaira. Open Studio from Alliance for Sustainable Energy, LLC is also mandatory required. Otherwise these software, their installing guides, other free software and plug in will be provided in class. Students that don't have any experience on solid modeling are strongly recommended to get supplementary teaching courses or webinars.
Academic integrity and honesty. The class is against plagiarism and dishonesty. Cheating, appropri-ation of materials from other authors without crediting them and re-using researches or projects done in previous course without appropriate authorization is a violation of the University's code of academic integrity. Penalties for such violations can result in loss of credits, to fail the course and, in severe cases, to incur legal actions. For any text and image used, students are required to place clearly source references and credits in appropriate way using standard conventions.
Type of Assessment. Student's work evaluation is based on attendance and credits get during the semester. Class policy establishes that if the student is not attending classes and has

collected more than three absences fails the exam. In any case, the professor is not responsible for students who are not receiving information due to their truancy. Evaluation is expressed on the assignments results and graded on thirty taking in consideration originality, creativity, refinement, dedication, attention, completeness, correctness. Below is the grading criteria.

- 30L- 29 exceptional evaluation, awarded to students whose work is outstanding
- 28-27 distinguished evaluation, awarded to students whose work is good
- 26-24 average evaluation, awarded to students whose work is adequate
- 23-18 low evaluation, awarded to students whose work is sufficient but not completely satisfying in all the aspects
- • NC «not classified», awarded to students whose work is missing or presents severe
- lacks.

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Assignments and Grade. Final student grading is based on individual evaluation as a result of dif-ferent credits and specific weight acquired on the following assignments.

Credit Assignment Weight
1 Conceptual School Building Energy Assessment 30%
2 Personal Taccuino for Proposal 20%
3 Schematic Proposal for Approval 20%
4 Envelope Prototype Manufacturing 30%

Although grading is based on individual evaluations, students are allowed to develop assignments #3 and #4 in groups not bigger then 3 members. Vice versa assignments #1 and #2 must be carry out individually.

Class Scheduling. Arguments of the class are developed as an integrated contribution inside the «Architecture and Environment Design Lab» course where students are asked to provide a sche-matic design of a school building in a Mediterranean context.
Inside this frame, the class covers different aspects of Environmental Design in different phases of the project according with the «Architectural Design III» class program and fully integrated with the «Environmental Control Techniques» class activities.
As shown on the next page, the «Environmental Design» program involves a progressive development from conceptual to detailed design where the focus, in the final phase, will be on the architectural envelopes.