McGill
School of Architecture
McGill University
Macdonald-Harrington Building

AMAL: THE RESILIENT SCHOOL

General information

Course number: ARCH 304 Design and Construction 2

Term: Winter 2015

Instructor: Ipek Türeli

- 6 credits
- (2-10-6) 2 hr lecture; 10 hr in-studio; additional 6 hr for assignments
- Prerequisite: ARCH 303

Weekly schedule:

Macdonald-Harrington Building annex; first-floor studio; and R 212 for lectures. The following is general schedule; for variations, check the list of dates; and please note that there may be amendments during the course of the semester.

T, Th: 10 am meetings in 2012 for lectures/viewings as scheduled; 2:05-5:05 pin-up group presentations in studio; or individual desk crits in instructor's office, #306

Learning outcomes:

General: Continuation of Design and Construction I with projects of increasing complexity. Projects deal with particular aspects of architectural design and/or explore approaches to design methodology. Discussions, readings, field trips and practical exercises.

Upon completing this studio, you will have learned how to:

1. Analyze and respond to a precarious context and site conditions
2. Develop an architectural program and strategy for deployment of a "type" building, and

3. Apply (environmental, social, economic, and cultural) sustainable strategies pertaining to educational buildings.
4. And you will have developed an understanding of the issues surrounding the designing of(and for) camps and other states of exception

Project objectives

You will be designing the Amal Elementary School.

Amal means “hope” in Arabic.

The school design is to serve children living in camps due to disasters.

The design of Amal will be informed by the long history of experiments in school design and age appropriate.

Space Needs:
A typical elementary school features the following types of spaces:

- Administrative Offices
- Art facility
- Cafeteria that often doubles as the auditorium, aka "cafetorium."
- Classroom—Daylighting is most important in classrooms, where most teaching and learning occurs.
- Common areas/courtyards
- Gymnasium
- Health Services
- Lobby—Schools often showcase team trophies in the foyer or feature a colorful display at child's eye level.
- Library and/or Media Center—Schools are changing traditional libraries into media centers, adapting to new technology, as well as to other issues such as comfort, flexibility and maximum use of space.
- Multipurpose Rooms
- Music Education
- Restrooms
- Science Facility

However, resources are limited in camps and for refugees. You need to provision for flexible spaces that can take on more than one function at a time.

Amal is a special elementary school. It caters to traumatized children. It acts as a community center. This means supplementary facilities such as a dental clinic, a vaccination facility (for babies not necessarily enrolled in the school, and children), a medical room to treat amputees, and a psychological counseling room, as you see appropriate based on your research.

Amal will take care of children 8-6 pm and enable their parents, usually consisting of only mothers due to the war, to seek work, training, educational or opportunities themselves. It will offer children a morning snack, lunch, and an afternoon snack. A kitchen will serve both the children and the staff.

Amal's design will provision for indoor and outdoor activities and social gatherings. An edible garden and a playground will be integrated.

Amal will be staffed by long term and short term volunteers from elsewhere. Accommodation for them and visitors such as donors should be thought of.

The Site and Siting:
Amal is a "type" school. You will design one and make a proposal about how they should be placed in relationship to each other in a given camp; and how they may share resources as a network of elementary schools.

Replicas of Amal [1] will be deployed as needed and distributed among the camp population, and across the 20+camps, so that students do not have to use transportation or walk long distances.

Your specific commission is for Syrian refugees in the town of Reyhanli, in the province of Hatay in Turkey at its Syrian border.

Age group, curriculum:
Amal will focus only on the younger children. It will cater to students 6-10 years old. In 2012, the Turkish Grand National Assembly new legislation on primary and secondary education termed as "4+4+4." This means 4 years of mandatory primary or elementary school, 4 years of middle school, both mandatory; and 4 years of high school. Amal will teach Syrian children both Arabic and Turkish and help them integrate into Turkish middle schools.

In accordance with the latest recommendations in educational facility design in North America toward smaller schools with shared facilities, Amal will be for 100 children; only 25 in each of the four levels. The learning will take place in the school. The students will not be given home-work to realize in the evening when they join their families as they may not have adequate conditions.

Connection to Montreal:
This school design will be used to fundraise in Montreal.

Option 1: It will be prefabricated by a manufacturer in Quebec and shipped to Turkey. Some of the well-known Quebec-based companies include: Profab, Maisons Bonneville, Modulex, Maison Nordique, Demtec, RCM modulaire. Your design should fit in shipping containers (as few as possible); it should be robust for de-assembly and re-assembly in another location. But it should also be of biodegradable materials and

re-purposable (up-cyclable) in case it is left in place post-use as a school.

UNICEF Turkey has declared its goal of establishing 30 new refabricated schools in the camps in the coming year. The first such school opened in 2013 in the Süleyman Şah Tent City of Akçakale near SanliUrfa. This prefab school was donated by the Kingdom of Belgium and fitted by UNICEF-Turkey.

Option 2: It will use local labor and local materials to achieve a low budget.

Montrealers have already funded a school in Reyhanli named Al-Salam (an example of Option 2). Information on this school will be provided through a guest lecture and visual documentation uploaded on myCourses. Al-Salam has grown into school catering not only elementary but middle and high school levels, with 1,860 students, but still not meeting the demand.

A Unique Vision:
Both the locally built Al-Salam and the prefab UNICEF school are large. For example, the latter features 16 classrooms at 40 student capacity each, and serving in two rotations to a total of 1280 students. Amal will present a different vision: smaller scale and distributed.

Secondly, sustainability will be integrated and key component of not only the building but also the curriculum. You will consider not only environmental sustainability but also social, cultural and economic sustainability.

Environmental sustainability:
Amal is deployed in situations of disaster; an in such situations access to an infrastructure is rare; therefore, it should be self sufficient; it should generate its own energy; and consume as little as possible. This means it has to respond to environmental conditions. The design should feature solar control; use passive ventilation, cooling and heating effectively.

Institutional and social sustainability:
It is important that you have a basic understanding of the situation and the key actors.

Key Actors that help Syrians in Turkey in the Field of Education include the following:

- AFAD (Republic of Turkey, Prime Ministry Disaster & Emergency Management Presidency)
- Republic of Turkey, Ministry of Education
- Local governments in Turkey (e.g. Elected Municipalities, Appointed Governors' offices)
- UNICEF Turkey
- UNHRC (United Nations High Commissioner for Refugees)
- NGOs

The extracts below intend to summarize the situation and are from a report entitled "Educational Needs Assessment for Urban Syrian Refugees in Turkey" (September 2014) prepared by Stephanie Dolman.

Situation summary:

"Since the civil war in Syria started in 2011, more than 1,100,000 Syrians have streamed across Turkey's borders. About 220,000 of these Syrians live in 22 camps designed and operated by the Turkish Government's Disaster and Emergency Management Presidency (AFAD) in 10 provinces near the Syrian border.

Since the end of 2013, at the request of the Government of Turkey, UNICEF has partnered with the government to focus on providing education opportunities for Syrians in Turkish host communities. They are planning to provide 40 pre-fabricated school buildings in which an adapted Syrian curriculum will be taught in Arabic.

Currently, there are three different education pathways for school age Syrians in Turkey. First, school-age children in camps are able to attend schools operated by the Turkish Ministry of Education and AFAD. These schools use an adapted Syrian curriculum and conduct lessons in Arabic. The Turkish government does not officially accredit these schools, and therefore students are unable to receive a diploma or proof of school completion. Second, Syrians living outside of camps with residence permits are able to enroll in Turkish schools. Those without residence permits are also able to attend as guest students with school permission, but are not able to receive a diploma. Third, Syrians outside of camps without residence permits are able to attend Syrian schools operated in Arabic by different NGOs, individuals, and community organizations. These schools may or may not be officially recognized by the Ministry of Education. Under a Ministry of Education framework, organizations are able to provide education for Syrians using an adapted Syrian curriculum with Ministry of Education permission. The Ministry of Education works in cooperation with these organizations to monitor the schools and provide facilities, such as land for school buildings or pre-fabricated schools. Syrians may teach in these schools, but only as volunteers, and may not receive salaries, only "incentives." Despite cooperation with the Ministry of Education, students attending these schools are not able to receive a diploma or proof of school completion. Further, while only those schools operating under the framework are legal, there are many other schools operating outside of this framework and Ministry control.

Today, about 80 percent of school age (ages 6-17 years) Syrians are attending school in camps, while only 27 percent of their peers in host communities are attending. This extremely low attendance rate is alarming. Education for children and youth in emergencies is crucial. Syrian children are being deprived of the psychological healing that comes from the safe space, routine, and purpose for the day that school can provide. It is causing additional psychological toll on parents who worry they are not able to provide a better life for their children. As a result, much more information is needed to understand the educational opportunities available to Syrians outside of camps in Turkey, as well as barriers to participation.

Further, according to UNHCR, 75 percent of the Syrian refugee population is women and children. In Turkey, it is estimated that about 22 percent of Syrian heads of households outside of camps are women, although this number could be much higher. Given the large percentage of women comprising the displaced Syrian population, it is important to understand their unique situation and needs, so that stakeholders can best help them take care of themselves and their families."

Course materials:

There are only two required readings listed below.

A list of complimentary readings on **1) school design** is provided; the PDFs of these are provided in myCourses. Also, under myCourses, Contents, you will find links to reports on the **2) need for schools for Syrian refugees** in Turkey and links to online books on the **3) design of temporary and mobile structures**; links to reports and documents on **4) humanitarian architecture,** disciplinary explorations to help people displaced due to war and disasters, and **5) design guidelines for schools**.

Required readings

Türeli, İpek. "'Small' Architectures, Walking and Camping in Middle Eastern Cities." *International Journal of Islamic Architecture* 2, no. 1 (2013): 5-38.

Corner, James. "The Agency of Mapping: Speculation, Critique and Invention." In *Mappings*, edited by Denis Cosgrove, 213–252. London: Reaktion, 1999.

Complimentary Readings on School Design: Contemporary designs

Anne P Taylor; Katherine Enggass, *Linking Architecture and Education: Sustainable Design for Learning Environments,* Albuquerque: University of New Mexico Press, 2009. [E book, link provided in myCourses]

Mark Dudek, "Part I A "Origins and significant historical developments," *Architecture of Schools: the New Learning Environments* (Oxford; Boston: Architectural Press, 2000), 1-40.

O'Donnell Wicklund Pigozzi and Peterson, *The Third Teacher: 79 ways you can use design to transform teaching & learning,* New York: Abrams, 2010.

Mark Dudek; Dorothea Baumann; et al, *Schools and Kindergartens: A Design manual,* Basel; Boston: Birkhäuser, 2007.

Ton Verstegen et all, *Contemporary Dutch School Architecture: A Tradition of Change,* Rotterdam : NAi Publishers/Staro, 2008.

Detail Magaine. March 2013. Special issue on "Building for Children."

Overviews of historical transformations:

Neil Briem Gislason, "Chapter 1: Building Paradigms: Major Transformations in School Architecture (1798-2009)" and "Chapter 2: Framing School Design: Theory, Study Objectives, and Research Methods," in *School Design: History, Case Studies, and Practice*, Dissertation, PhD in Education, University of Toronto, 2009, pp. 8-77.

Carl Kaestle, "The Common School Reform," *Pillars of the Republic: Common Schools and American Society, 1780-1860* (New York: Hill and Wang, 1983), 104-135.

Dale Allen Gyure, "Part One: Buildings and Builders," In *The Transformation of the Schoolhouse: American Secondary School Architecture and Educational Reform, 1880-1920.* PhD in Architectural History, University of Virginia, 2001, 16-109.

Dell Upton, "Lancasterian Schools, Republican Citizenship, and the Spatial Imagination in Early Nineteenth-Century America," *Journal of the Society of Architectural Historians* vol. 55, no. 3 (1996): 238-253.

Educating 'Others':

David Wallace Adams, "Chapter 4: Institution," and "Chapter 5: Classroom," In *Education for Extinction: American Indians and the Boarding School Experience, 1875–1928* (Kansas: University Press of Kansas, 1995), 97-135; 136-163.

Geoffrey Paul Carr, "Chapter 1: Troubling Typologies of the Indian Residential School," In *'House of No Spirit': An Architectural History of the Indian Residential School in British Columbia*, PhD in Art History, University of British Columbia, 2011, 42-81.

Barbara Reeves-Ellington, "Chapter 5: The Constantinople Home," *Domestic Frontiers: Gender, reform, and American interventions in the Ottoman Balkans and the Near East* (University of Massachusetts Press, 2013), 140-165.

Open plan and other experiments:

Brian Keating; T L Zani, "What is an open plan school?" and "Impact of Open Plan Schools," In *The Development of Open Plan Primary School Building Design in Australia* (West Perth, W.A.: Education Dept. of Western Australia, 1977), 3-22; 40-44.

Herman Hertzberger, *Space and Learning: Lessons in Architecture* (Rotterdam: 010 Publishers, 2008), 22-73.

Ivan Illich, *Deschooling Society* (New York: Harper&Row, 1971), 1-24.

Instructional Method

Projects will be developed in a studio-based system where the studio is to be understood as an active working space that will produce a collective and shared body of research and knowledge from which individual projects will emerge. Active participation both in programmed discussions and project review sessions (crits) is expected and should be understood as part of the learning process.

Morning lectures and/or film screenings (10 am), scheduled as needed twice a week, will provide a multidisciplinary outlook incorporating approaches from different perspectives.

Films

*De school als stad = The school as city by Herman Hertzberger (*2012) by Moniek van de Vall; Gustaaf Vos NA1153 H47 A4 2012

Schooling the World: The White Man's Last Burden (2010) by Carol Black LC2605 S366 DVD

Return to Homs (2013) by Talal Derki

Exemplary case where Canadians funded a school in one of the camps:
Al-Salam School (Reyhanli, Turkey) directed by Hazar Al Mahayni, from Canada

SCHEDULE AND SUBMISSION DATES

1	Jan 6		Murdoch Laing Competition
	Jan 8		
2	Jan 14		Murdoch Laing Competition
	Jan 15		
3	Jan 20		Murdoch Laing Competition
	Jan 22		

Background: Schools + Refugee camps

4	Jan 27	10 am	unit project introduction
		2-5 pm	library research on background
	Jan 29	2-5 pm	film screening (1) + read Tureli's "Small Architectures…"
		5:30 pm	panel with Prof. Julie Norman, Gina Safadi and Faisal Alazem
5	Feb 3	10 am	guest Megan Bradley of PoliSci, McGill & film screening (2)
		2 pm	guest Rafif Jouejati, Director, Free Syria Foundation via Skype
		3-5 pm	pin-up presentation of background in studio (**PAGE X**)
	Feb 5	10 am	guest Faisal Alazem of Syrian Kids Initiative
		2-5 pm	studio-work with tutorial sign-up (to review program drafts)

Page X will be produced in groups of two. You can use as many A1 sheets as you like (provided they are all landscape oriented). You will chose one of the following six

topics and produce visual presentations (that may include text, maps, diagrams, charts, tables, illustrations, architectural drawings, photographs, time-lines) that summarize your research into the history and evolution or current norms on the topic that will enrich the project at hand. This is a precedent study as well. Hence, you will demonstrate your findings by actual examples. Together all the Xs will constitute an introduction to the studio, and a literal introduction to a book-format publication that will come out of this studio. It is imperative that you provide your sources, and distinguish your voice/contribution from your sources'.

- **Camp,** Camps, History and Theory (e.g. G. Agamben). History, current numbers, and locations of refugees in the region
- **Syrian Refugee Camps,** Locations, Evolution, Organizations, Designs
- **Professional responses** to humanitarian crisis such as that of Syrian refugees. Precedents, architects working with post-disaster camps
- **School design and pedagogy**, architectural and curriculum design, history and current ideas that relates to the project, schools for traumatized children
- **Environmental sustainability in schools** – what are the special factors considered in a school? What are strategies employed in notable predecents?
- **Prefabrication and school buildings**. History of prefabricated schools. Possibilities and issues to do with shipping and assembly.

As an example you can view the student work "Atlas" produced on Western Sahara at ETH in the studio of Manuel Herz. In the *Atlas to Refugee Camps in Western Sahara*, "the information collected on each topic was represented using maps, diagrams, charts, tables, illustrations, time-lines, images. This information [was] placed within a larger context and in relation to the main political and historical occurrences."
http://www.studio-basel.com/projects/western-sahara/atlas/
http://www.studio-basel.com/projects/western-sahara/student-work/

Architectural Programming

6	Feb 10	10 am	guest Claude Yacoub, architect, founder of Ila Souria
		2-5 pm	pin-up presentation of programming (**PAGE 1**)
	Feb 12	10 am	guest Claudia Mitchell, McGill Prof. Education, Director, Participatory Cultures Lab, and Fatima Khan
		2-5 pm	read Corner's chapter "Agency of Mapping" studio-work with tutorial sign-up (to review site&manifesto)

Site & manifesto

7	Feb 17	2-5 pm	pin-up presentation of site (**PAGE 2** with 300-word manifesto)
	Feb 19	12-5 pm	**Interim Review I** (of Pages X, 1, 2) in R 101

8	Feb 24	2-5 pm	presentation of building concepts (**PAGE 3 + Study model 1**)
	Feb 26	2-5 pm	studio-work
9	Mar 3	Spring break	
	Mar 5	Spring break	

Concepts (social, economic, ecological sustainability; pedagogical and/or assembly)

10	Mar 10	2-5 pm	presentation of plan, section & scenarios (**PAGE 4 + Study model 2**)
	Mar 12	2-5 pm	studio-work with tutorial sign-up
11	Mar 17	2-5 pm	presentation of façade & configurations (**PAGE 5 + Study model 3**)
	Mar 19	2-5 pm	studio-work with tutorial sign-up

Design development

12	Mar 24	2-5 pm	presentation of system assembly (**PAGE 6 + Study model 4**)
	Mar 26	12-5 pm	**Interim Review II** (of Pages X, 1-6) in R 101
13	Mar 31	2-5 pm	presentation of 3D visualizations, interior and exterior (**PAGE 7 & 8** & layout)
	April 2	2-5 pm	studio-work (revisions based on feedback)
14	Apr 7	2-5 pm	studio-work with tutorial sign-up
	Apr 9	10-5 pm	**Interim Review III** (all pages) Rafael Fisher & Claude Yacoup
	April 21	10-5 pm	Final presentation (all pages, revised)

All pages will be printed as A1s (landscape format, size: 841 mm X 694 mm) for weekly studio pin-ups. For tutorials bring a PDF on a flash-drive to the instructor's office during the time slot you will have signed up for.

Your final presentation during April 9 and April 21 will have 4 study models and 8 A1 pages in this layout:

1	3	5	7
2	4	6	8

Grading

25% Murdoch Laing Competition
10% Page X research
5% Each phase, Pages 1-8 [with 4-6 including a min of 3 study models], total 40%
25% Final review

Digital submission requirements

(1) 11X17" Printed Folder (1 copy)
This folder must contain the work from all the assignments. Developmental work (sketches and study models can also be included) Selected stills from films must be included. The cover page of this document must contain the following information:
Your name:
Course Title +Number:
Instructors: Ipek Tureli
McGill University School of Architecture
Winter 2015

(2) DVD/CD (2 copies)
As a part of the final grade for the course each student must submit a DVD/CD documenting the final work of each project in the term. The DVD/CD must be organized in the following way and must include the following items:
Main Folder: The main folder should be named in the following format: COURSE YEAR TERM_LASTNAME (for example: ARCH672 2013 FALL_JOHNSON.).

- Content of Main Folder: For each major project of the term please create a subfolder within the main folder with the project name (i.e. "PROJECT 01_MICRO DWELLING", "PROJECT 02_PRECEDENT STUDY", "FINAL PROJECT_HOUSING", etc…). Create subfolders titled "DRAWINGS" AND "MODELS" within each project folder:
- In the "DRAWINGS" folder save all final boards/drawings for the project as high quality PDF's (each image included in the PDF should be at 300 PPI). Also include one splash image (2400x1800 resolution JPEG) that best represents the project. Final animations and other key final graphic files may also be included in this folder. Please take care to name each file in a clear manner (i.e. "Final Board 01.pdf").
- In the "MODELS" folder save images of the final models for the project in question. Photos should be in JPEG format and be 300 PPI. Please take care to name each file in a clear manner (i.e. "Detail Model.jpeg").
- DVD/CD Case: Submit your DVD/CD in a plastic clamshell case. Print out a cover for the clamshell case that has a splash image of the project, your name, studio, year, and term. Also label the DVD/CD itself with your name, studio, year, and term.

One DVD each is to be given to the course instructor (Ipek Tureli) and to: Juan Osorio, Media Technician, School of Architecture McGill University, Macdonald-Harrington Building, Room G-12

Academic Integrity

McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see www.mcgill.ca/students/srr/honest/ for more information).(approved by Senate on 29 January 2003)

L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site www.mcgill.ca/students/srr/honest/).

In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded. approved by Senate on 21 January 2009 - see also the section in this document on Assignments and evaluation.)

Conformément à la Charte des droits de l'étudiant de l'Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté (sauf dans le cas des cours dont l'un des objets est la maîtrise d'une langue).

Student Performance Criteria (Canadian Architectural Certification Board)

The following Student Performance Criteria, as defined by the CACB, are addressed in the master's year final studio program:

A1, A2, A3, A4, A5, A6, A7, A8, A9, B1, B2, B3, B4, B5, B7, B8, B9, B11, B12, C1, C2, D1, D2

The complete list of the 31 Student Performance Criteria is included here (and can be found online at http://www.cacb-ccca.ca/documents/2010CACB_CCCA-Guide.pdf):

A1. Critical Thinking Skills.
Ability to raise clear and precise questions, use abstract ideas to interpret information, consider diverse points of view, reach well reasoned conclusions, and test them against relevant criteria and standards

A2. Research Skills.
Ability to employ basic methods of data collection and analysis to inform all aspects of the programming and design process.

A3. Graphic Skills.
Ability to employ appropriate representational media to convey essential formal elements at each stage of the programming and design process.

A4. Verbal and Writing Skills
Ability to speak and write effectively on subject matter contained in the professional curriculum.

A5. Collaborative Skills
Ability to identify and assume divergent roles that maximize individual talents, and to cooperate with others when working as members of a design team and in other settings.

A6. Human Behaviour
Understanding of the relationship between human behaviour, the natural environment and the design of the built environment.

A7. Cultural Diversity
Understanding of the diverse needs, values, behavioural norms, and social/spatial patterns that characterize different cultures and individuals, as well as the implications of this diversity on the societal roles and responsibilities of architects.

A8. History and Theory
Understanding of diverse global and local traditions in architecture, landscape, and urban design, as well as the factors that have shaped them.

A9. Precedents.
Ability to make a comprehensive analysis and evaluation of a building, building complex, or urban space.

B1. Design Skills
Ability to apply organizational, spatial, structural, and constructional principles to the conception and development of spaces, building elements, and tectonic components.

B2. Program Preparation
Ability to prepare a comprehensive program for an architectural project that accounts for client and user needs, appropriate precedents, space and equipment requirements, the relevant laws and standards, and site selection and design assessment criteria.

B3. Site Design
Ability to analyze and respond to context and site conditions in the development of a program and in the design of a project.

B4. Sustainable Design
Ability to apply the principles of sustainable design to produce projects that conserve natural and built resources, provide healthy environments for occupants/users, and reduce the impacts of building construction and operations on future generations.

B5. Accessibility.
Ability to design both site and building to accommodate individuals with varying physical and cognitive abilities.

B6. Life Safety Systems, Building Codes and Standards
Understanding the principles that inform the design and selection of life-safety systems in buildings and their subsystems; the codes, regulations, and standards applicable to a given site and building design project, including occupancy classifications, allowable building heights and areas, allowable construction types, separation requirements, occupancy requirements, means of egress, fire protection, and structure.

B7. Structural Systems
Understanding of the principles of structural behaviour in withstanding gravity and lateral forces, and the evolution, range and appropriate applications of structural systems.

B8. Environmental Systems
Understanding of the basic principles that inform the design of environmental systems, including acoustics, illumination and climate modification systems, building envelopes, and energy use with awareness of the appropriate performance assessment tools.

B9. Building Envelopes
Understanding of the basic principles involved in the appropriate application of building envelope systems and associated assemblies relative to fundamental performance, aesthetics, moisture transfer, durability, and energy and material resources.

B10. Building Service Systems
Understanding of the basic principles that inform the design of building service systems, including plumbing, electrical, vertical transportation, communication, security, and fire protection systems.

B11. Building Materials and Assemblies.
Understanding of the basic principles utilized in the appropriate selection of construction materials, products, components, and assemblies, based on their inherent characteristics and performance.

B12. Building Economics and Cost Control
Understanding of the fundamentals of development financing, building economics, construction cost control, and life-cycle cost accounting.

C1. Detailed Design Development
Ability to assess and detail as an integral part of the design, appropriate combinations of building materials, components, and assemblies.

C2. Building Systems Integration
Ability to assess, select, and integrate structural systems, environmental systems, life safety systems, building envelopes, and building service systems into building design.

C3. Technical Documentation
Ability to make technically precise descriptions and documentation of a proposed design for purposes of review and construction.

C4. Comprehensive Design.
Ability to project a comprehensive design based on an architectural idea, a building program and a site. The design or designs should integrate structural and environmental systems, building envelopes, building assemblies, life-safety provisions, and environmental stewardship.

D1. Leadership and Advocacy
Understanding of the techniques and skills for architects to work collaboratively with allied disciplines, clients, consultants, builders, and the public in the building design and construction process, and to advocate on environmental, social, and aesthetic issues in their communities.

D2. Ethics and Professional Judgment
Understanding of the ethical issues involved in the formation of professional judgment regarding social, political and cultural issues in architectural design and practice.

D3. Legal Responsibilities
Understanding of the architect's responsibility to the client and the public under the laws, codes, regulations and contracts common to the practice of architecture in a given jurisdiction.

D4. Project Delivery
Understanding of the different methods of project delivery, the corresponding forms of service contracts, and the types of documentation required to render competent and responsible professional service.

D5. Practice Organization

Understanding of the basic principles of practice organization, including financial management, business planning, marketing, negotiation, project management, risk mitigation and as well as an understanding of trends that affect practice.

D6. Professional Internship.
Understanding of the role of internship in professional development, and the reciprocal rights and responsibilities of interns and employers.

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- © Instructor generated course materials (e.g., handouts, notes, summaries, exam questions, etc.) are protected by law and may not be copied or distributed in any form or in any medium without explicit permission of the instructor. Note that infringements of copyright can be subject to follow up by the University under the Code of Student Conduct and Disciplinary Procedures.
- As the instructor of this course I endeavor to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me and the Office for Students with Disabilities, 514-398-6009.
- Guidelines for the use of mobile computing and communications (MC2) devices in classes at McGill have been approved by the APC. Consult the guidelines for a range of

sample wording that may be used or adapted by instructors on their course outlines.

- End-of-course evaluations are one of the ways that McGill works towards maintaining and improving the quality of courses and the student's learning experience. You will be notified by e-mail when the evaluations are available on Mercury, the online course evaluation system. Please note that a minimum number of responses must be received for results to be available to students.
- McGill has policies on sustainability, paper use and other initiatives to promote a culture of sustainability at McGill.
- In keeping with McGill's preparedness planning strategies with respect to potential pandemic or other concerns, the Administration suggests that all course outlines contain the statement: "In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.
- Additional policies governing academic issues which affect students can be found in the McGill Charter of Students' Rights.