

APSC 381 Project List for 2008

Project 1: Energy potential in precipitation

A method of collecting the energy contained in natural precipitation may help to minimize a building's energy consumption. A system that can be integrated into a building's design is required.

Project 2: Wind funnel

Investigate the feasibility and necessity of including a funnel in the design for a residential turbine. Wind Solutions Inc. has contracted you to develop a funnel that can be easily implemented in conjunction with a residential turbine.

Project 3: Non-creasing plastic wrap

In its current form, plastic wrap is inconvenient and hard to use. People with poor motor skills, such as the elderly and the young, cannot easily use the material due to its tendency to fold over itself and crease. Fix this!

Project 4: Dual-flush toilet retrofit

All new toilets are required to be low-flow, but requirement does not apply to existing toilets. It is suggested that a device that can be added to an existing toilet that could turn it into a dual-flush system would help reduce residential water consumption.

Project 5: Home/Condo recycling system

Conventional residential recycling systems and methods have been unsuccessful in stimulating change in the way people think of recycling. It is evident that another approach is necessary.

Project 6: Noise-canceling open windows

Instead of relying solely on air conditioning for summer climate control in office buildings, opening windows can save a significant amount of energy. In urban cores or in construction zones, however, distracting outdoor noise pollution can be a deterrent to opening windows. A system that will allow office workers to open their windows without worrying about outdoor noise is required.

Project 7: Minimizing standby power consumption of home electronics

Standby power, or “ghost loads”, typically account for about 10-105% of a home’s energy consumption. Elimination of this unnecessary load would help alleviate the current burden placed on the conventional energy grid. A simple, in-home mechanism is required to stop this phenomenon.

Project 8: Residence green roof retrofit

The university is looking for a way to reduce its environmental footprint. It has been suggested that a green roof on a residence may be a way to achieve this goal.

Project 9: Kids toy to develop all 5 senses

Toys play an important role in a child’s development. An enticing plaything that stimulates a child’s senses would be a valuable and profitable tool in early childhood education.

Project 10: Grey water system for the PEC

On university campuses, gyms consume more water than any other buildings. The PEC has been criticized for its poor water management in the past, and would like to address this issue in the design for the new facility in the Queen’s Centre. Due to increasing pressures on Canadian water supplies, an improved water management system is required.

Project 11: Underground tunnel system for Queen’s

Rain. Wind. Sleet. Snow. Wintertime in Kingston lasts from approximately mid-September until the end of spring exams. Trekking through the elements can be an unpleasant experience, so an underground tunnel system has been proposed to help students navigate between classes without having go outside.

Project 12: Automated Highway

The City of Toronto has decided to take the socially responsible step of investing considerable funds in revolutionary energy-saving programs. The centerpiece of this new program is the implementation of proposed automated highways. The TTC and the City of Toronto has hired you to develop pilot highway, ensuring that it integrates smoothly with existing TTC resources and does not hinder conventional traffic.

Project 13: Clean beach for Kingston

Kingston residents do not have access to a clean beach on Lake Ontario, due to sewage overflow and city run-off. A local, clean, *swimmable* beach should be set up within city limits, with minimal disruption to ecosystems.

Project 14: Modular furniture design for residence

Residence rooms are typically dominated by bulky, utilitarian furniture provided by the university. Modular bedroom furniture would allow students to set up rooms according to their preferences, while maximizing floor space and adding a touch of individuality.

Project 15: Weather-Smart Thermostat

The Living Energy Lab has contracted you to design and create a thermostat that uses weather forecast data to pre-adjust heat and humidity levels in order to level out a residence's energy consumption and eliminate the "peaks-and-valleys" over-consumption pattern. Weather factors such as temperature, sun and wind exposure and humidity must be taken into account to create a product that will maximize residential energy efficiency.

Project 16: Mechanical pencil that will never break

Don't you hate when your mechanical pencil lead snaps? No matter how fancy or expensive a pencil you buy, this always seems to happen. A design that eliminates this problem would be a market success.

Project 17: Counter space maximization

Counter space in a kitchen, particularly in apartments, can be fairly tight. When a variety of appliances, such as toasters, blenders and other kitchen tools, are stored on the counter for convenience, even less space is available. A way to maximize counter space is required.

Project 18: Biodegradable batteries/printer cartridges

Batteries and printer cartridges are currently non-biodegradable. This means that they are either thrown out in landfills, where they release toxins and do not break down, or they are reused once before they are thrown out.

Project 19: West Nile Mosquito Strip

Each summer, the threat of West Nile Virus is highlighted by health agencies across Canada. There is currently no way of knowing whether insects in an area have been infected until symptoms and casualties are revealed, in either humans or birds. The Ontario Ministry of Health has contracted you to develop a mosquito strip that is capable of identifying insects infected with West Nile Virus, to be used by homeowners as an early detection method.

Project 20: Library laptop lock

Laptop theft in university libraries and common study areas is a key concern to students. Stauffer library would like to install a laptop lock at each existing workspace. These locks should be easily installed in the current Stauffer set-up, connect to all types of laptops and be effective anti-theft devices.

Project 21: Kingston bike lanes

Cyclists in Kingston find it difficult and dangerous to get around. The old city infrastructure does not lend itself to bike-friendly upgrades, and this is a problem that is being encountered throughout Canada. The impending energy crisis, however, makes it imperative that Canadian cities be prepared for environmentally-friendly transportation upgrades. An effective method for cyclists to commute throughout Kingston, without compromising the city's historical value, is required.

Project 22: Cell phone ring indicator for household electronics

Many people today forgo the standard home phone and simply use a cell phone for their telephone needs. One downside of this system, however, is that if the phone is not in the same room as the user he/she may not hear the ring, particularly if it is in silent mode. A way of indicating that one's cell phone is ringing is required.

Project 23: Nalgene/Tupperware residual taste remover

Consumers tend to get rid of reusable containers such as Nalgene and Tupperware containers before they become structurally unsound due to residual tastes that certain foods and liquids can leave in the plastic. A method of removing these tastes would significantly decrease the frequency with which the supposedly environmentally-friendly containers are discarded.

Project 24: Solar Cooker

Green Cook Solutions, Inc. specializes in the design and manufacture of solar-powered slow cookers. They would like to expand their business to include high-end solar roasters that can be sold to families in North America. The product should be a viable replacement for the conventional oven, and be within a reasonable price range.

Project 25: Athens on Fire!

In culture-rich countries such as Greece, widespread fire can have devastating effects on national artifacts and monuments. While the fire itself poses a huge threat, conventional containment methods such as water drenching can be equally destructive to ancient relics and sites. The government of Greece has commissioned you to develop a non-damaging preservation method that can be applied to both national treasures and residences.

Project 26: Kids glue that sticks to nothing but paper

Children's white glue is messy and unsightly when it is allowed to dry on unwanted surfaces such as walls and clothing. A glue that sticks to nothing but paper products would eliminate the scrubbing (and the scolding) associated with unwanted glue!

Project 27: Backpack bicycle

Bike theft on university campuses and in downtown areas is a chronic problem. Some commuters have opted to replace their traditional bicycles with folding scooters, which can be easily stored and carried indoors. For longer commutes, however, a bicycle remains the preferred method of transportation. A backpack bicycle that can be folded and deployed easily would be a perfect compromise.

Project 28: Urine indicator dye for public pools

Despite popular urban legend, a coloured indicator that detects the presence of urine in pool water does not currently exist. Kids are catching on, so it's time to invent one!

Project 29: Tidal farm to power Queen's

With its lakeside location, Queen's University is in a prime location to harness the minor tides and wave activity of Lake Ontario. Design a system to capture this energy.

Project 30: Automated basketball player

When shooting hoops alone, it is impossible to practice passing and plays. An automated basketball collector that catches, passes and collects the ball when it goes through the hoop would allow kids to spend more time outside.

Project 31: PEC Generation Centre

Students working out on stationary bicycles and elliptical machines can produce considerable energy. Design a system to harness this wasted energy and feed it back into useful applications.