Course Summary: This course is designed to present a comprehensive approach to site planning and development that incorporates low-impact development (LID) approaches and techniques. LID is a conservation-based site planning process that sets aside critical open space buffers, reduces impervious surfaces and concentrates development into appropriate “building envelopes”. It also includes a broad range of best management practices including green roofs, bioretention, rain gardens, vegetated swales, constructed wetlands and infiltration systems. These practices reduce stormwater runoff and provide effective water quality treatment. LID is a smart growth technique that is gaining significant attention by land use planners, regulatory officials, civil engineers and the environmental community. It provides a “win-win” situation in that environmental impacts are significantly reduced at lower site development costs. The course will provide valuable site planning and design skills to students and practitioners.

Grading & Exams Grades will be based upon two take-home exams (related to a selected case study/project) and participation in class. A field trip will also be organized to observe LID development features in the field and to meet first-hand with developers and regulators who have been directly involved in LID.

Topic Areas

1 Goals of the Course/Overview of LID

Content: This lecture will be presented by Nathan Kelly, AICP a graduate of Tufts UEP Program and currently Senior Planner with Horsley Witten Group. Nathan will provide an overview of the course materials and will discuss the mechanics of the course.

2 LID Planning: Open Space Design Site Planning

Content: LID site planning involves a resource-based approach that starts with
the mapping of critical resources including wetlands, drinking water sources, habitat areas and scenic views. Homes and other development sites are then selected to maximize views and provide adequate protection of environmental resources. Finally the LID process then selects appropriate transportation networks including roads, bicycle trails and pedestrian ways.

Reading: LID Workshop Manual, Sections I and II and Smart Growth & Smart Energy Toolkit, LID Module

3 LID Best Management Practices

Content: This will include detailed descriptions and design considerations for a broad range of LID practices including green roofs, bioretention, rain gardens, vegetated swales, constructed wetlands and infiltration systems. Design drawings and actual photographs will be used.

Reading: LID Workshop Manual, Section III

4 Implementing LID: Land Use Codes and Incentives

Content: This section of the course will explore how to implement LID planning and best management practices. Local land use regulations including zoning and subdivision codes will be explored as opportunities to encourage and/or require LID developments.

Reading: Smart Growth & Smart Energy Toolkit, LID Model Bylaw

5 LID Case Studies

Content: Several LID case study projects will be evaluated in detail. Case studies will include explanation of why the projects incorporated LID, relative costs (compared to conventional development), water quality analyses (showing the treatment benefits) and aesthetic features.

Reading: LID Workshop Manual, Section IV

6 Field Trip

Content: A full-day field trip will be organized to allow students to visit actual (built) LID projects and to discuss them with the owners, developers and/or designers. Currently a trip to the award-winning Pinehills project in Plymouth, MA is planned. This project has won national awards as the Best Planned Community in the USA and has numerous LID features. The field trip is estimated to include approximately 7 hours of “contact time” and will substitute for two classes (TBA).

7. Assignment – LID Case Study
You have been hired as a “peer reviewer” to provide a second opinion on how to re-design a project to incorporate LID features and to balance the hydrologic budget. You are to assume that the project is in a sensitive watershed that already has water quality problems and some evidence of lowered water levels. This should include starting from “scratch” and conducting a resource-based site planning approach to laying out the development. However, you must provide the same “development program” including the same number of units and floor area for the buildings.

Suggested Steps:

a) Select a case study: This should be a real project that is before a local regulatory agency. The project should include at least three residential units and/or 5,000 square feet of commercial, industrial or governmental space. Select a case study location (town) that you have easy access to. DUE: June 4

b) Obtain the proposed project plans: This should include a set of site plans that show existing conditions, site topography and a proposed project plan that includes drainage/grading and other features (Planning Board or Zoning Board of Appeals if a 40B Application). Other helpful materials might include a Notice of Intent (Conservation Commission), a drainage report (stormwater management) and any other environmental assessment/impact reports. DUE: June 11

c) Obtain and review applicable laws/codes: Most likely this will include the towns zoning and subdivision codes (Planning Board or town web site) and possibly the MA Wetlands Protection Regulations (if within 100 feet of wetlands). DUE: June 11

d) Site Analysis Map/Report: Analyse the existing conditions to determine site constraints and opportunities. Mark up a plan highlighting this and write a brief report (3-4 pages describing this and how they should be incorporated into a development plan). DUE: June 18

e) LID Plan/Report: Based upon the site criteria and applicable local codes and state laws, design an alternative plan that incorporates LID features. Prepare a brief report (3 – 5 pages) that describes your rationale for the selection of BMPs and how they will reduce pollutants and balance the hydrologic budget. DUE: June 25