Core Design

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This article examines the role of 'Core Design' within the first year studies of the Design and Technology Degree Course. Core is followed by students on both 3 year degree and the 4 year 'with education' course. It reveals the debt owed to a variety of 'Core' studies in design whilst indicating the contemporary requirement for a 'new-foundation' within the degree of Design and Technology at Loughborough. This requirement is highlighted through case-studies of students and their work within 'core'.

It is not uncommon for eduational strategies to employ a preliminary phase in which the basic building blocks of the course are established and demystified. Schools, higher education and industry often seek to establish a foundation of skills, knowledge and attitudes through a variety of learning situations. But it is, perhaps, in the area of Design education that the concept of foundation courses is at its richest. The requirement for a suitable foundation in secondary school is important — the requirement at the level of higher education is essential. In this department the entire first year is a form of foundation in that, whilst it must be passed, no marks are carried forward to the degree. The intention is to allow students to experiment and to learn in areas that they may have been weak, whether that be, for example, technology, materials skills or communications.

Universities and Polytechnics are in the difficult position of facilitating the development of a broad cross-section of students. Any given design course will consist of young men and women with a variety of backgrounds. If they are to develop they must possess the skills and abilities to access the resources available. First year undergraduate students of design have traditionally been subjected to a foundation course as preparation for the second, third and fourth years of a design studies programme. The foundation courses of the public sector have found great success with students of Art and Design. They have done much to develop creative and receptive strategies and many of these can be traced back to educationalists such as Lethaby or Gropius in the early part of the twentieth century.

'The chief function (of the preliminary course) is to liberate the individual by breaking down conventional patterns of thought in order to make way for personal experiences and discoveries which will enable him to see his own potentialities and limitations'. (Walter Gropius, The Theory and Organisation of the Bauhaus 1923, reprinted in Form and Function, Benton and Sharp (1975)).

Design and Technology at Loughborough, is a very different animal to the one confronted by the artists and theorists of the Bauhaus. There is, therefore, a new kind of foundation experience required by our undergraduates. If contemporary students are to access the information and resources of our society they need a new set of building blocks at their disposal.

A new foundation has been developed at Loughborough specifically to combine the best of the traditional model with the requirements of today's society. It seeks to maintain the provocative and liberating elements of a traditional foundation and yet build upon that. Great faith is still placed in practices that aim to sensitize students. Activities take place that can be identified with Gropius' 'breaking down of conventional patterns'. However, the subject of these cognitive strategies at Loughborough is just as likely to be electronic or mechanical as painterly or sculptured. The entire first year of the Design and Technology Course may be viewed as an example of this new foundation. Many contemporary 'Core' programmes offer the inputs of skills and knowledge but omit the vital sensitization activities and project management skills which are essential to a sound and fulfilling manipulation of technological information.

The second part of this article deals with the structure of that sensitization. The 'core design' programme at Loughborough is presented as an essential and integral component of the first year foundation studies. Each term will be discussed in turn, and will make reference to the work of students, to reveal the gradual development of these building blocks and how the students, in retrospect, perceive 'Core' and its value to them.

Structure of course

'Core' is one day per week and involves all 30+ first year students. It takes place in workshops and studios, and involves visitis to appropriate exhibitions wherever possible.

Design Foundations demand a flexible and open-ended approach. The Loughborough 'Core' course aims to maintain this within a controlled and assessable 'project' structure. Project management skills are gradually developed by starting on several one day projects which eventually develop to 2, and 3 days in term 2. Term 3 is allocated to one, longer term Core project.

First year undergraduates undertaking the 'nomadic structures' brief in week 1 of term 1.

The first term seeks to encourage students to work as part of design teams as well as individual designers. It aims to 'loosen up' attitudes and break down preconcieved boundaries between thinking, drawing, and making. It also introduces new skills with processes and materials both graphically and in physical modelling.

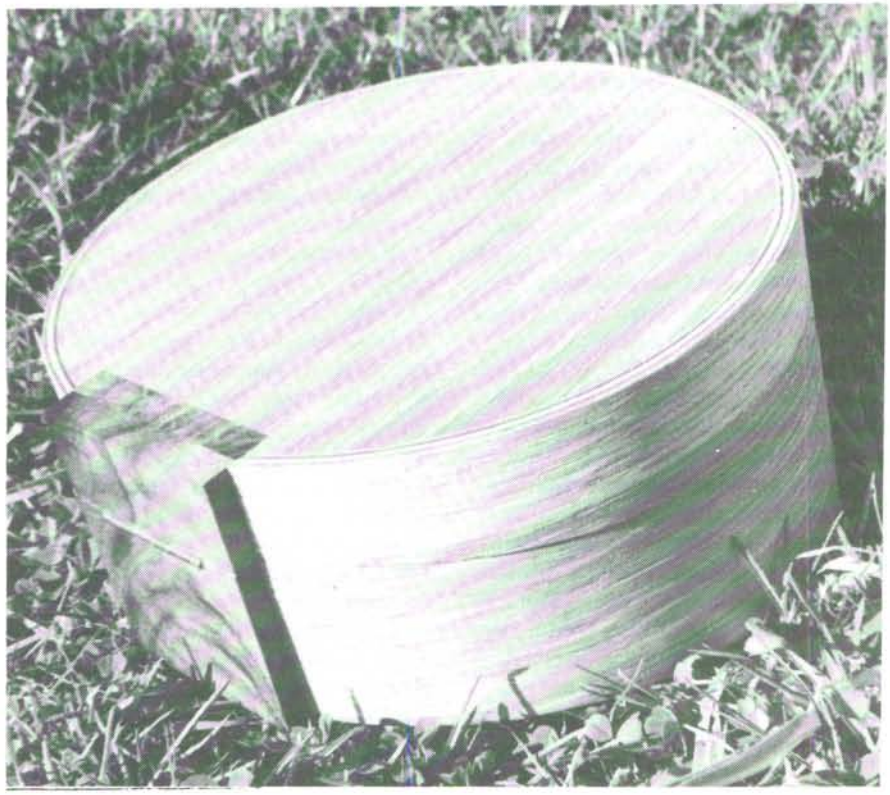
One of the earlier one day briefs involves groups of students working together in teams, to build nomadic shelters. It is carried out away from the workshop situation in a local woodland setting. It is intended that this project will promote skills of delegation, negotiation and group synergy, as well as the need to acheive quality with a variety of unusual materials and meet a deadline. In addition to these skills it is hoped that this project will familiarise the students with their new peer group, the staff and Loughborough's surrounding environment, less obvious objectives, but nevertheless important.

Later in the term a two day project explores further the potential of wood as a material. Other projects have helped students to discover that its qualities and uses can vary enormously depending on what wood is used or how it is treated.

The project, to design and make a jewellery container is intended to increase the students awareness of laminated wood within the formal constraints of a set brief. Self analysis and evaluation are established at the earliest opportunity in project work. Whilst working on an individual product students are paired and instructed to produce a mould which will subsequently enable two quite different boxes to be produced. In this way other subtle but powerful factors were introduced in terms of group work: communicating, agreeing directions, planning etc.

One of last year's students, Andrew Tanzer, summed up his approach to the project in his report. It also illustrates the importance of developing skills in the articulation of creative strategies, including both visual as well as technical features.

> 'Traditional high quality wooden containers have been made of solid timber, because of this they have been restricted in shape.
>
> By laminating timber, which is a method of glueing thin slices of timber together, a very strong piece of wood can be formed. As the slices of timber are thin, they are easy to bend, and a very wide variety of shapes can be formed.
>
> This overcomes the problems of shaping solid wood into curved shapes, with the associated problems of short grain and timber wastage. Solid timber has a further disadvantage in that it will move, ie: contract and expand, depending upon its moisture content, and that of the air around it.
>
> The grain of successive layers of laminates can be placed at 90 degrees to each other, therefore overcoming this problem with movement. Laminated timber is far stronger than normal wood of similar dimensions and shape, and has been used in a variety of diverse ways from tennis rackets, to aeroplanes, to complicated roof beams.
>
> The design for the jewellery container contrasts the light coloured timber laminate, with solid dark walnut insert, emphasising the curved form of the container, and the unconventional direction of the grain.
>
> The timber container is sloped backwards away from the users, therefore reducing harsh vertical lines, and matching the large smooth diameter curve of the container.
>
> The top of the container is hinged backwards, allowing the container to be left open, showing the jewellery within to its best advantage'.



Wooden laminated box

Andrew Tanzer is a mature student of 21, one of four in his year group. His background is fairly unusual in that he trained in the stone and wood carving trade and has a Higher National Certificate in Building Studies.

Although Andrew found that because of his background he already had the basic manufacturing skills and the sensitivity towards materials that are one aspect of the course, he found that he was able to build upon these during core projects.

Aspects of core that he felt were important in his development were communication skills — the presentation of his ideas to others.

Andrew found that Core explained to him how important it was to use time efficiently, concentrating on aspects of designing that were appropriate to the project in hand.

The course also gave him a feeling for how important an understanding of technology is, even for the simplest of products. He felt it put aspects of technology and ergonomics into context, particularly in terms 2 and 3.

By being able to see how others tackled projects in core he was able to improve his own personal standards. As he said, ' . . . not to copy but to use the expertise that was there in the group'. Students, on arrival, tend to be highly competitive and secretative about their ideas. Core makes a special point of encouraging them to share their thoughts and so, synergistically, to expand them.

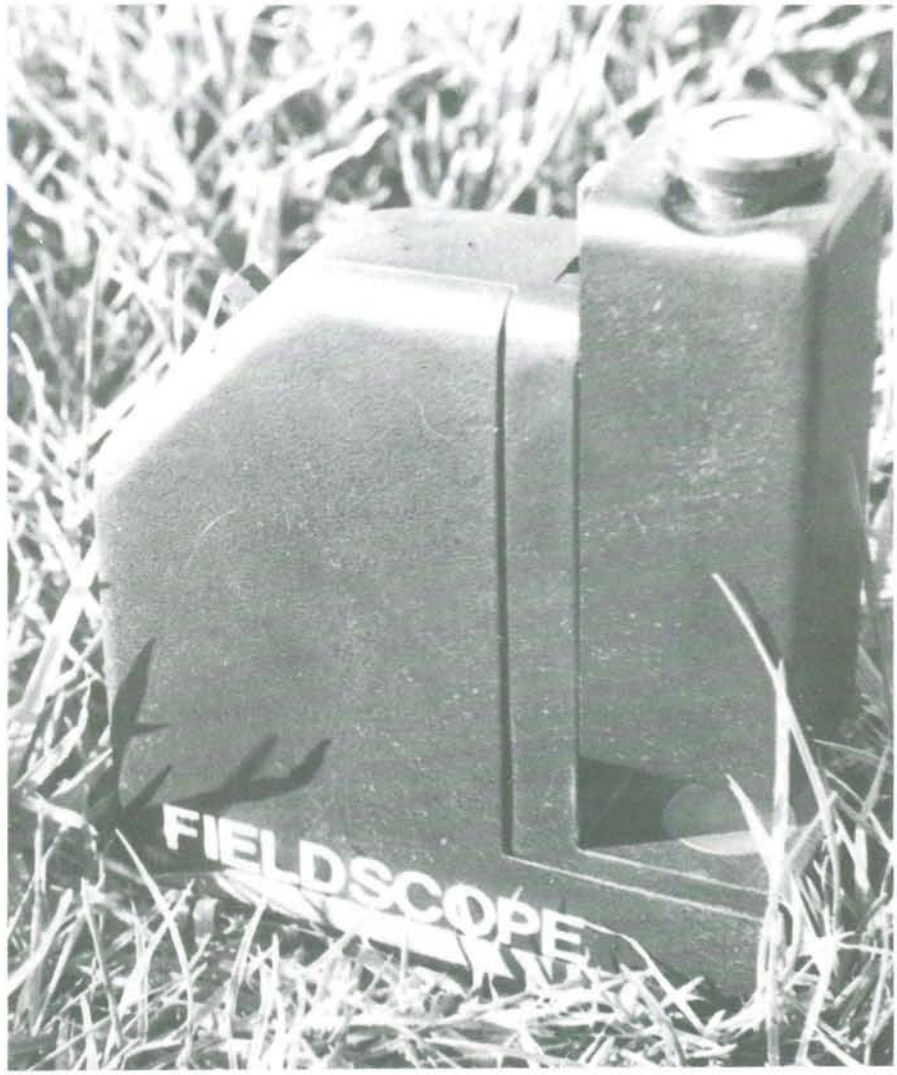
In term two, three, three week projects are set. These are projects that are once again building up students design and making skills 'homing in' particularly on the importance of quality 3D modelling. By concentrating on one aspect of a project, without neglecting its relationship with other (and equally valid) ones, the student develops particular skills. Although these are fused together towards the end of the year in Core they are seen as primary building blocks for second and third year desing practice.

The first brief is one in which a product is designed and a solid model is produced, while the internal detailing is worked out and expressed on paper. Such projects have been; a torch for the elderly, a calculator for the young, a computer mouse, and an in line dimmer switch. In this way the student is sensitised to: the detailed construction of small, injection moulded products; and awareness to design for assembly, access etc; and the skills required to produce a finely detailed model in addition to appropriate 'lash up' models.

The second is a group project where the objectives are modelling to scale and an examination of the human aspects of an interior design, this year each team had to design and produce an interior for a holiday narrow boat.

An external visit is arranged to cover certain areas of research for this project. This year we arranged a visit to The Boat Show.

Each year the feedback indicates just how difficult it is to work within a team, but they learn a lot about themselves, how to utilise other peoples strengths and work round their weaknesses. At the same time they learn how to achieve a satisfactory model that confronts design issues rather than replicates a 'dolls house'.



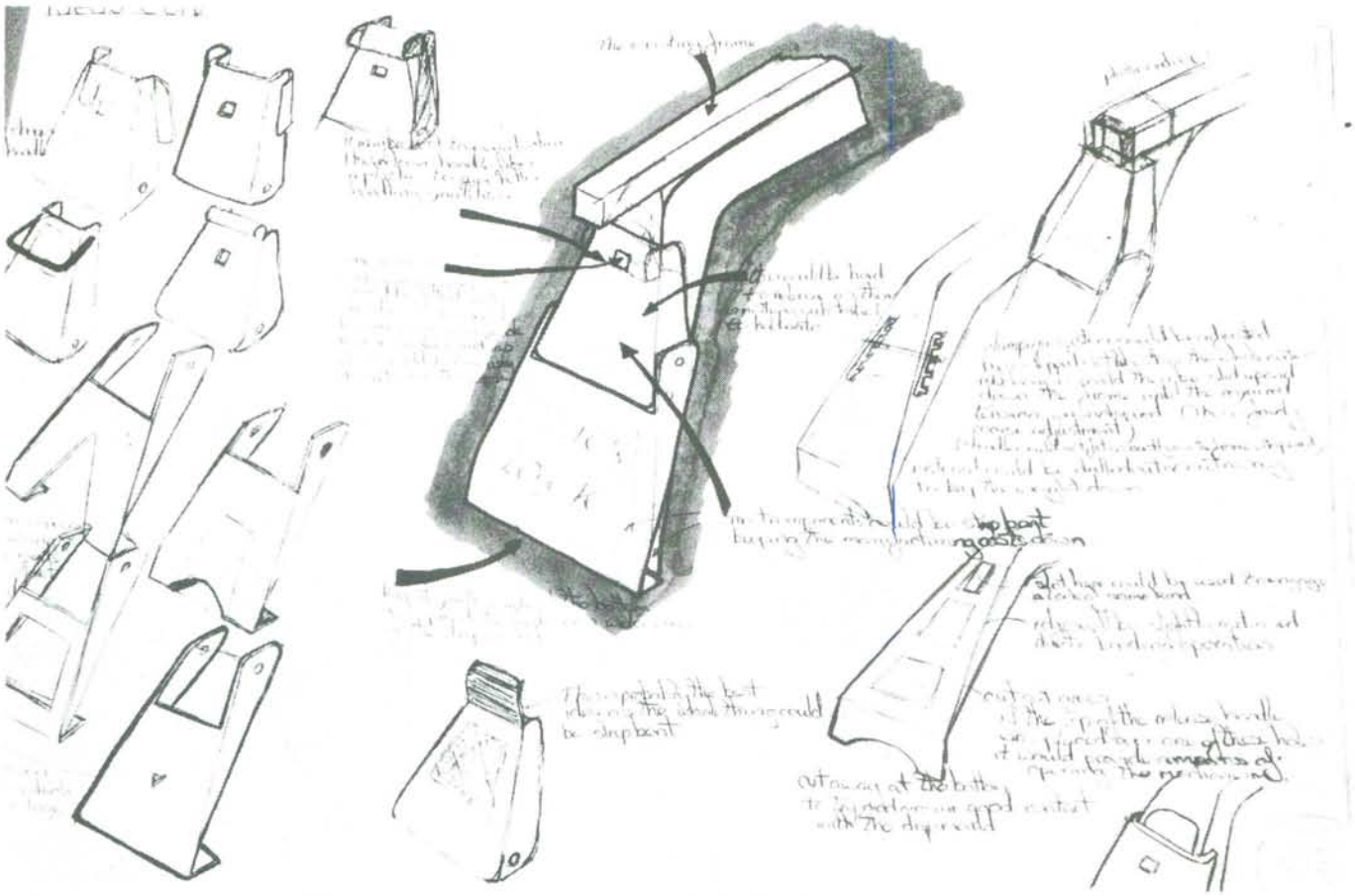
We have chosen to look at Raymond Pennington's answer to illustrate the third project in term two. Raymond came to us with good 'A' level grades in Chemistry, Physics, Design and General Studies.

There is no one set of 'A' levels that we demand as an entry requirement for the course although having studied Maths and Physics at 'A' level gives students a significant advantage in coping with the important technological content of the course. Because of this the majority of our students have in fact successfully tackled Maths, Physics and a Design orientated subject in the sixth form.

The third modelling project is to design and to make a product illustrated by a working model. In this respect the project develops on the objectives of the previous ones but with the additional aspect that it should both look like a mass produced, injection moulded, product, and also work. This is a new level of challenge, visual sensitivity must be combined with technical competence and an awareness of the potential user.

For the last two years the product has been a mass produced teaching aid. A choice between two briefs, a pinhole camera, or a simple microscope last year led Raymond Pennington to produce 'a simple, microscope system which was capable of low magnification. It clearly demonstrated the principles involved to school children and was compact and sturdy enough for use on field trips to observe small plants, insects etc'.

On reflection of the content of core Raymond felt that it had taught him a lot about the manipulation of materials,



Cal Roof Rack — Quick Release Leg

and graphics. He felt that the way he was expected to approach design projects speeded up his creation of ideas. He felt that the work brought about a vast improvement in his skills as a designer and maker in a short space of time.

In his case he found the use of various types of modelling invaluable as he found he was able to respresent his thoughts in a far more efficient manner than in two dimensional sketching.

He did feel that at first he created more work for himself than was necessary but that the deadlines set taught him to analyse what was essential to the task in hand — time management.

The diversity of project made him aware of new materials and skills that he is now able to call upon during the second year and not to be afraid of the unkown in seaching for solutions, new materials or methods of construction.

At the end of term two we give out the last set of briefs for the first year. Students are given a choice of three. The time span involved is that it must be completed before the end of year display in the summer term, approximately 7 weeks plus whatever time is spent over Easter on research.

The projects vary each year but there is at least one that emphasises the use of electronics within a product, one that is mechanical in feeling and one that is a general piece of product design utilising a variety of expertise. Whilst these biases do exist, each product demands the incorporation of a whole range of technical skills and design sensitivities.

This last year the three projects set were;

to design a simple low cost portable anti-mugging alarm which will give a sufficiently clear, audible signal.
to design a lightweight pocketable clamp for use with a 35mm SLR camera.
working from a given roof rack, redesign the legs so that they are easily fixed and unfixed.

It is hoped that the students will carry out a body of research during the Easter vacation and be ready to design, make and evaluate their working prototype during the summer term, using the skills and expertise they have massed together during their first year in the department.

Paul Savill at 23 is another of the mature students with a non 'A' level background who found that the ethos and skills that he gained from 'core' helped him to develop his confidence and identity as a designer. Paul tackled the problem of the car roof rack leg, finding it brought together much of the mechanics, graphics and production methods he had learned in year one.

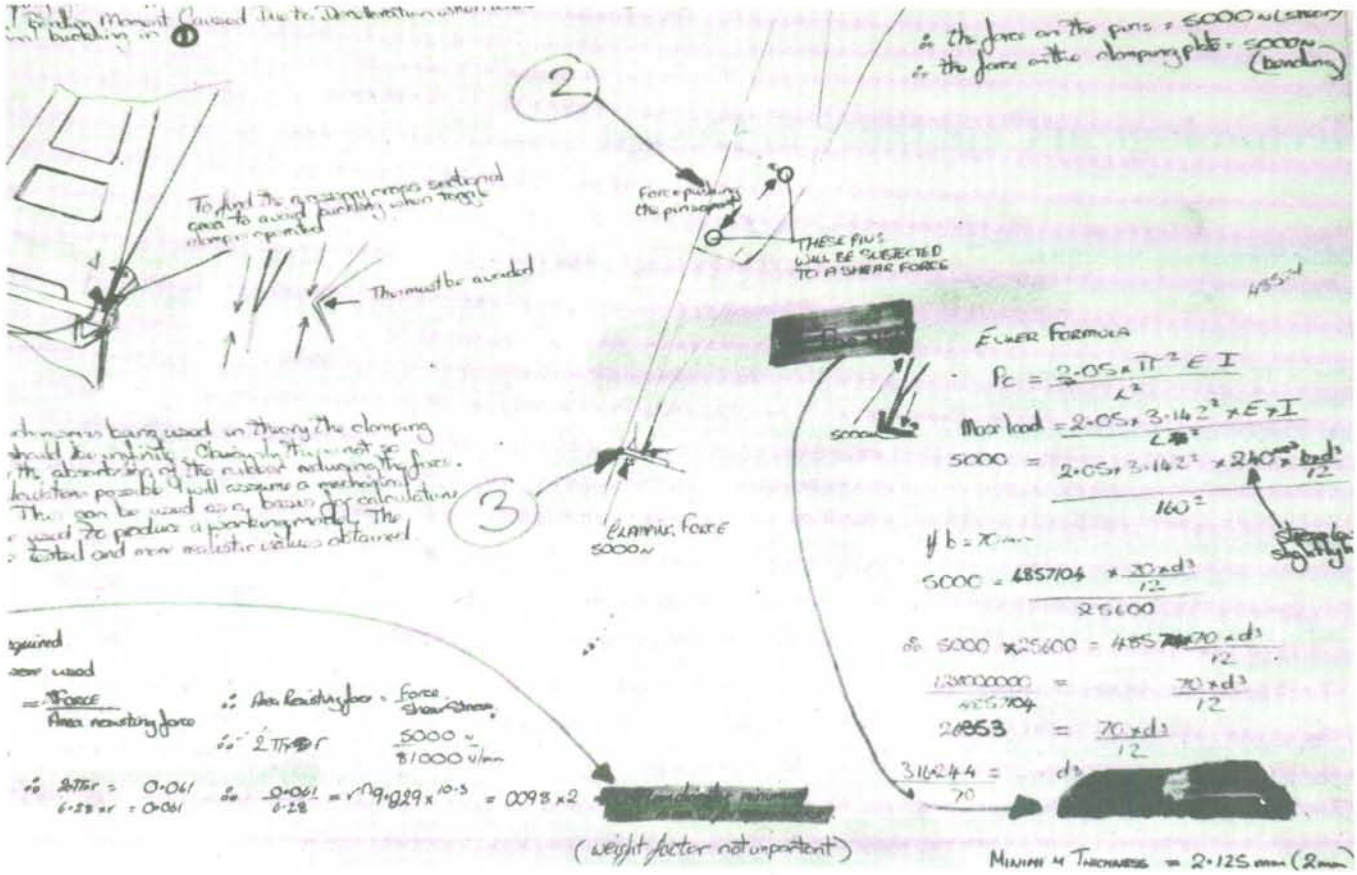
Paul found the importance of graphics within all core work a valuable lesson as his practical skills were already fairly well developed when he started the course. Although new skills in model making were an area he appreciated.

He recognised the importance of working as part of a team and wished that more of the work could be in this form although he recognised the difficulties in assessing group work. He felt the competitive nature of his year group helped to raise standards very quickly.

Having to meet deadlines with core projects he felt has had a significant influence on how he is able to cope with the longer projects presented to him in the second year. In this context he appreciated the developmental progress of the course starting with short sharp inputs leading up to the final one term project in which he chose to tackle the redesign of the roof rack leg.

In summary we can see that Core design has a set of key purposes which would be common to most foundation courses for design:

To stimulate the imaginative use of ideas in solving problems and recognising opportunities.
To develop design skills using modelling in appropriate manners.
To realise ideas with visual and technical sensitivity, in a variety of materials.
To provide a background of information on designing and making (in conjunction with other



aspects of the course), in order to enable the student to develop a sense of identity and purpose as a designer.

With this there is a complex set of objectives, some of which are subtle, some more obvious:

To learn to work as a member of a group and realise the synergy possible within it.

To encourage students to 'loosen up' in their relationships with each other in terms of discussion and generating ideas even when working on individual projects.

To learn how to manage project work over time.

To develop observation skills including the use of sketching.

To develop communication skills: verbal; written; graphics; modelling.

To generate confidence in the student's ability to tackle open ended situations and achieve a satisfactory conclusion.

What is important is that when these objectives are taken as a whole they represent a very powerful learning medium. The results, in terms of the physical objects produced, are impressive, if one looks deeper in terms of the students understanding, concepts and attitudes to designing it becomes clear that a very firm foundation has been laid for future work.

Car Roof Rack — Quick Release Leg