

Semantic-UI Part IV

Responsive

Programming

Learn a broad range of programming and problem solving skills, including exciting new platforms, software tools and languages. Use these skills to build apps for mobile, cloud and device based IoT applications. Evolve a portfolio of fascinating applications.



Data Science

At the heart of many IoT applications is data: measurements, events alarms and other information that must be relayed, stored and ultimately turned into knowledge. Learn the fundamentals of modern approaches to data in this strand.



Devices

The 'Things' we connect to are often physical devices. These can range from simple temperature sensors to sophisticated control systems like traffic lights or cameras. Connecting to and interacting with the physical world is the subject of this strand.



Networks

This strand will explore modern networks and cloud technology. Be able to configure, network and manage all categories of computer systems from simple controllers to single board computers, mobiles and full workstations.



Department of Computing & Mathematics



Waterford Institute of Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

BSc (Hons) the Internet of Things

BACHELOR OF SCIENCE (HONOURS)

APPLIED COMPUTING IN THE INTERNET OF THINGS

Program your World!

An exciting new level 8 Honours Degree for 2015. Combine Programming and Electronics and learn how to code cool devices, places and things. Be part of the next wave of innovation in Computing

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Mathematics

Introduce foundation concepts for many of the more applied concepts in the other Strands. Learn mathematical techniques in a modern context and apply core principles in new and interesting ways.

Supported by leading edge research at...



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Supported by leading edge research



Icons

<http://semantic-ui.com/elements/icon.html>



Alarm



Alarm Slash



Alarm Outline



Alarm Slash
Outline



At



Browser



Bug



Calendar Outline



Calendar



Code



Comment



Comments



Comment
Outline



Copyright



Dashboard



Dropdown



External
Square

```
<i class="alarm icon"></i>
<i class="alarm slash icon"></i>
<i class="alarm outline icon"></i>
<i class="alarm slash outline icon"></i>
<i class="at icon"></i>
<i class="browser icon"></i>
<i class="bug icon"></i>
<i class="calendar outline icon"></i>
<i class="calendar icon"></i>
<i class="cloud icon"></i>
<i class="comment icon"></i>
<i class="comments icon"></i>
<i class="comment outline icon"></i>
<i class="comments outline icon"></i>
<i class="copyright icon"></i>
<i class="dashboard icon"></i>
<i class="dropdown icon"></i>
<i class="external square icon"></i>
<i class="external icon"></i>
```


Icons

facebook twitter linkedin

```
<footer class="ui segment">
  <p class="footer-social-links">
    <a href="http://www.facebook.com/witcomp"> facebook </a>
    <a href="http://twitter.com/ComputingAtWIT"> twitter </a>
    <a href="https://ie.linkedin.com/pub/computing-at-wit/a9/221/1b6"> linkedin </a>
  </p>
</footer>
```



```
<footer class="ui center aligned segment">
  <a href="http://www.facebook.com/witcomp"> <i class="large facebook icon"></i> </a>
  <a href="http://twitter.com/ComputingAtWIT"> <i class="large twitter icon"></i> </a>
  <a href="http://www.linkedin.com/pub/computing-at-wit"> <i class="large linkedin icon"></i> </a>
</footer>
```

Colours

<http://semantic-ui.com/usage/theming.html>

```
site/globals/site.variables less

@primaryColor : @pink;
@secondaryColor : @grey;
@red : #B03060;
@orange : #FE9A76;
@yellow : #FFD700;
@olive : #32CD32;
@green : #016936;
@teal : #008080;
@blue : #0E6EB8;
@violet : #EE82EE;
@purple : #B413EC;
@pink : #FF1493;
@brown : #A52A2A;
@grey : #A0A0A0;
@black : #000000;
```



ALL COLORS



```
<article class="red column">
  <h2> <a href="strands/programming.html"> Programming </a> </h2>
  <p>
    Learn a broad range of programming and problem solving skills, including exciting new p
    languages. Use these skills to build apps for mobile, cloud and device based IoT applic
    fascinating applications.
  </p>
</article>
```

The screenshot shows a webpage layout with a header banner featuring icons of a globe, gears, and a shield. Below the banner are four columns of text:

- Programming** (Red background): Learn a broad range of programming and problem solving skills, including exciting new platforms, software tools and languages. Use these skills to build apps for mobile, cloud and device based IoT applications. Evolve a portfolio of fascinating applications.
- Data Science**: At the heart of many IoT applications is data: measurements, events alarms and other information that must be relayed, stored and ultimately turned into knowledge. Learn the fundamentals of modern approaches to data in this strand.
- Networks**: This strand will explore modern networks and cloud technology. Be able to configure, network and manage all categories of computer systems from simple controllers to single board computers, mobiles and full workstations.
- Project**: Building exciting IoT projects in every semester programme. Your projects will combine skills from the other strands and enable you to build a comprehensive and compelling portfolio of IoT applications and services.

At the bottom right, it says "Supported by leading edge research at".


```

<section class="ui three column row">
  <article class="red column">
    ...
  </article>
  <article class="orange column">
    ...
  </article>
  <article class="yellow column">
    ...
  </article>
</section>

```

```

<section class="ui three column row">
  <article class="olive column">
    ...
  </article>
  <article class="green column">
    ...
  </article>
  <article class="blue column">
    ...
  </article>
</section>

```

Programming

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Networks

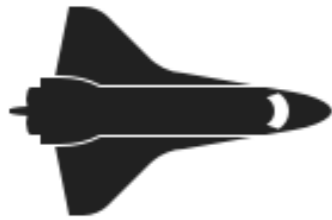
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```
<i class="huge settings icon"></i>  
<i class="huge bar chart icon"></i>  
<i class="huge space shuttle icon"></i>  
<i class="huge cloud upload icon"></i>  
<i class="huge lab icon"></i>  
<i class="huge wizard icon"></i>
```

```
<article class="red column">
  <h2> Programming </h2>
  <p>
    Learn a broad range of programming and problem solving skills
  </p>
  <div class="ui two column grid">
    <div class="left aligned column">
      <i class="huge settings icon"></i>
    </div>
    <div class="right aligned column">
      <a href="strands/programming.html" class="strandlink">
        <i class="huge sign in icon"></i>
      </a>
    </div>
  </div>
</article>
```

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- Encapsulate icons in 2 column grid
- Left align first icon
- Right align second icon

Raised Segment

Raised



A segment may be formatted to raise above the page.

Example



Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Vestibulum tortor quam, feugiat vitae, ultricies eget, tempor sit amet, ante. Donec eu libero sit amet quam egestas semper. Aenean ultricies mi vitae est. Mauris placerat eleifend leo.

```
<div class="ui raised segment">  
  <p>Pellentesque habitant morbi tristique senectus et netus et  
malesuada fames ac turpis egestas. Vestibulum tortor quam, feugiat  
vitae, ultricies eget, tempor sit amet, ante. Donec eu libero sit amet  
quam egestas semper. Aenean ultricies mi vitae est. Mauris placerat  
eleifend leo.</p>  
</div>
```

Padded Segment

Padded



A segment can increase its padding

Example



```
<div class="ui padded segment">  
  <p></p>  
</div>
```

Stacked Segment

Stacked



A segment can be formatted to show it contains multiple pages

Example



Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Vestibulum tortor quam, feugiat vitae, ultricies eget, tempor sit amet, ante. Donec eu libero sit amet quam egestas semper. Aenean ultricies mi vitae est. Mauris placerat eleifend leo.

```
<div class="ui stacked segment">  
  <p>Pellentesque habitant morbi tristique senectus et netus et malesuada  
fames ac turpis egestas. Vestibulum tortor quam, feugiat vitae, ultricies  
eget, tempor sit amet, ante. Donec eu libero sit amet quam egestas semper.  
Aenean ultricies mi vitae est. Mauris placerat eleifend leo.</p>  
</div>
```



```
<section class="ui three column padded stacked grid segment">
```

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The IoT requires a new breed of software skills, with an emphasis on flexible, reactive, and highly networked applications and services. This software runs on a diverse range of systems, is frequently connected to cloudservices, and may be capable of leveraging large data sets to deliver inferences and decision support in an informed manner. The software is designed and implemented using agile techniques, with an emphasis on test driven development and quality user experiences..

- Images set to default size
- Text not positioned correctly

Year 1

Year 2

Year

Semester 1

Semester 2

Semester 3

Semester 4

Semester 5

Programming Fundamentals I

Programming Fundamentals II



Web Development I

Web Development II

```
<article>
  <h1> Programming </h1>
  <p>
    
```

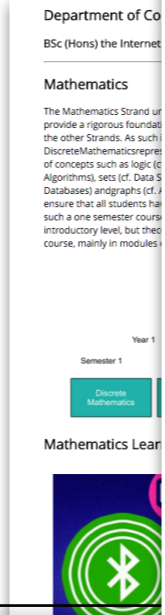
```
<article>
  <h2> Programming Learning Path </h2>
  <p>
    The Data Science strand will begin with the fundamentals of relational
  </p>
</article>
```

Programming Learning Path

The Data Science strand will begin with the fundamentals of relational databases used to store structured transac and descriptive analysis required to predict future events and to identify relationships in data. In the third year the managing unstructured data) databases and data warehouses (supporting consistent views of a domain, and as a the IoT context the importance of dealing with large volumes of data in terms of storage and analytics is great. Th appropriate data solution with a complete understanding and knowledge of the available options. The students w

Strand Pages

- Make the segment a 'grid'
- Rework each strand page to row/column structure
- + use 'ui image' for consistent image sizing



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Mathematics

The Mathematics Strand underpins most of the other strands: its purpose is to provide a rigorous foundation for many of the more applied concepts met in the other Strands. As such it is offered early in the course.

Discrete Mathematics represents a breadth first rather than depth first treatment of concepts such as logic (cf. Programming), complexity and recurrence (cf. Algorithms), sets (cf. Data Structures), enumeration (cf. Statistics), relations (cf. Databases) and graphs (cf. Algorithms and Networking). Its purpose is to ensure that all students have a basic mathematical literacy in such topics. In such a one semester course, the treatment will necessarily be at an introductory level, but the concepts will be covered in greater depth later in the course, mainly in modules on other Strands

Year 1
Semester 1
Discrete Mathematics

Year 2
Semester 2
Applied Calculus

Year 3
Semester 3
Mathematical Methods

Year 4
Semester 4
Statistics & Probability

Mathematics Learning Path

Applied Calculus ensures that students understand features of the real world such as rates of change (which are critical to many sensing systems) and can manipulate relationships between quantities that vary on a continuous scale. It also covers much of the engineering mathematics needed to understand the devices themselves, needed for the Devices and Systems Strand, and shows how numerical methods reconcile the finite, discrete world of digital computers and networks with the continuous world in which the IoT devices and networks are deployed. Mathematical Methods (in Semester 3) builds on the Applied Calculus module in Semester 2, and shows how the rate of change concept is extended to multivariate functions and its subsequent applications. However, the major focus of this module is on the concepts and methods of linear algebra, and the various applications in other modules during the programme (e.g., state-space modeling, computer vision and machine learning).

facebook twitter linkedin

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Networks

The network, its configuration, management, and evolution. Whether fixed, wireless, ad-hoc, sensor based, or hybrid and applications will derive much of their power from the secure and robust network. In this context, identity, privacy, and security principles in their operation and management, diversity of devices, network infrastructure automation, and infrastructure (a.k.a. Infrastructure as Code) are critical.

Year 1
Semester 1
Computer Systems I

Year 2
Semester 2
Computer Systems II

Networks Learning Path

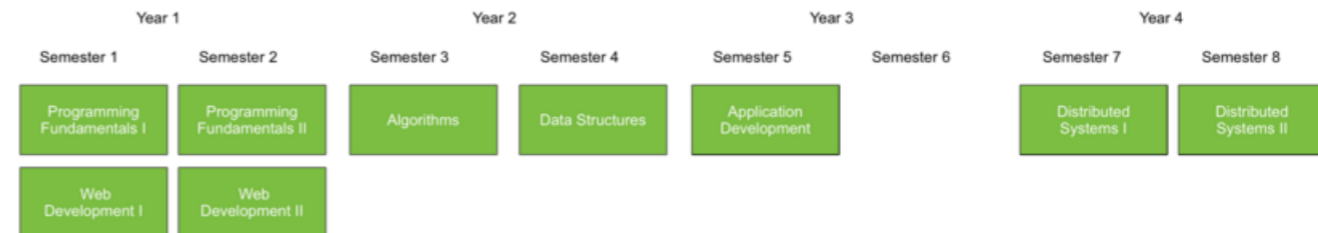
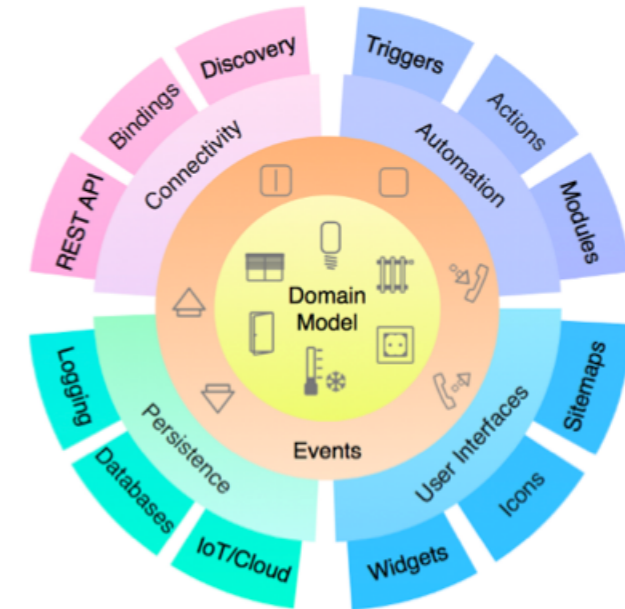
In the second year a more in depth coverage of networking is provided examining addressing, routing and networking protocols. Third year will see students explore the emerging area of DevOps and engage in the configuration, deployment and management of Cloud infrastructures. In the final year students will continue to work with Cloud Infrastructure technologies as well as taking a detailed look at device, system and network security.

programming.html



Programming

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The Data Science strand will begin with the fundamentals of relational databases used to store structured transactional business data. This data holds the basis for reporting and descriptive analysis required to predict future events and to identify relationships in data. In the third year the students will extend their knowledge to NoSQL (especially for managing unstructured data) databases and data warehouses (supporting consistent views of a domain, and as a springboard for statistics and machine learning analyses). In the IoT context the importance of dealing with large volumes of data in terms of storage and analytics is great. The skills they learn will allow them to design and implement the appropriate data solution with a complete understanding and knowledge of the available options. The students will learn about the trade-offs in terms of consistency, availability and partitioning. In the fourth year students will learn and implement the skills of data mining covering classification, prediction and clustering, applied to data that had been managed using methods and technologies they have learned about in previous years.

ui grid

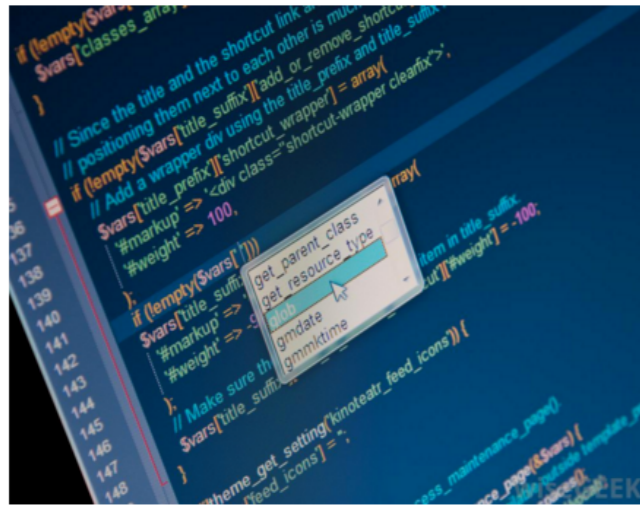
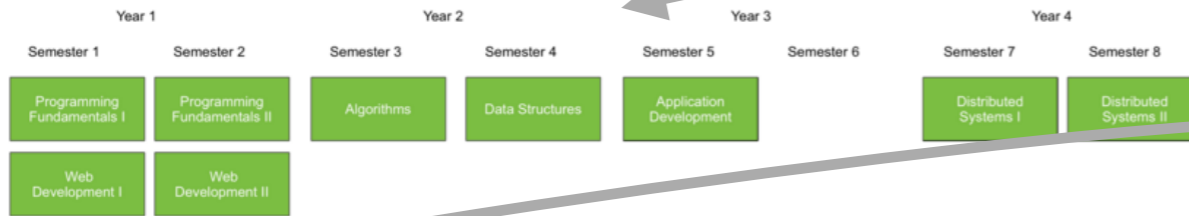
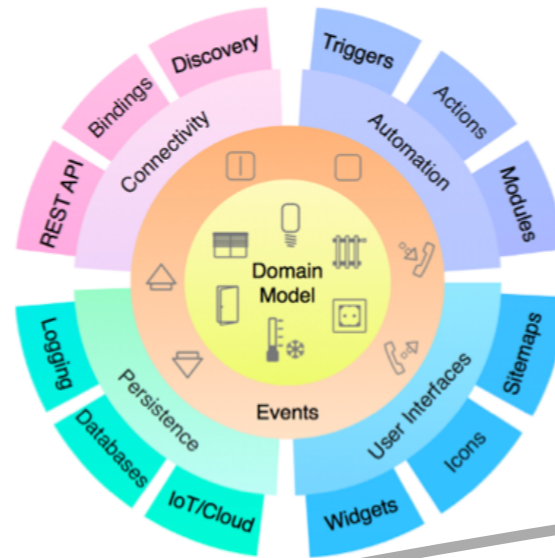
- Each grid is 16 units
- “eight wide” consumes half the available width
- ‘sixteen wide’ consumes full available width

```
<article class="eight wide column">
  <h1> Programming </h1>
  <p>
    The IoT requires a new breed of software skills, with an emphasis on f
  </p>
</article>

<aside class="eight wide column">
  
  
  
  
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  <p>
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  </p>
</section>
```

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<aside class="eight wide column">
  
  
```

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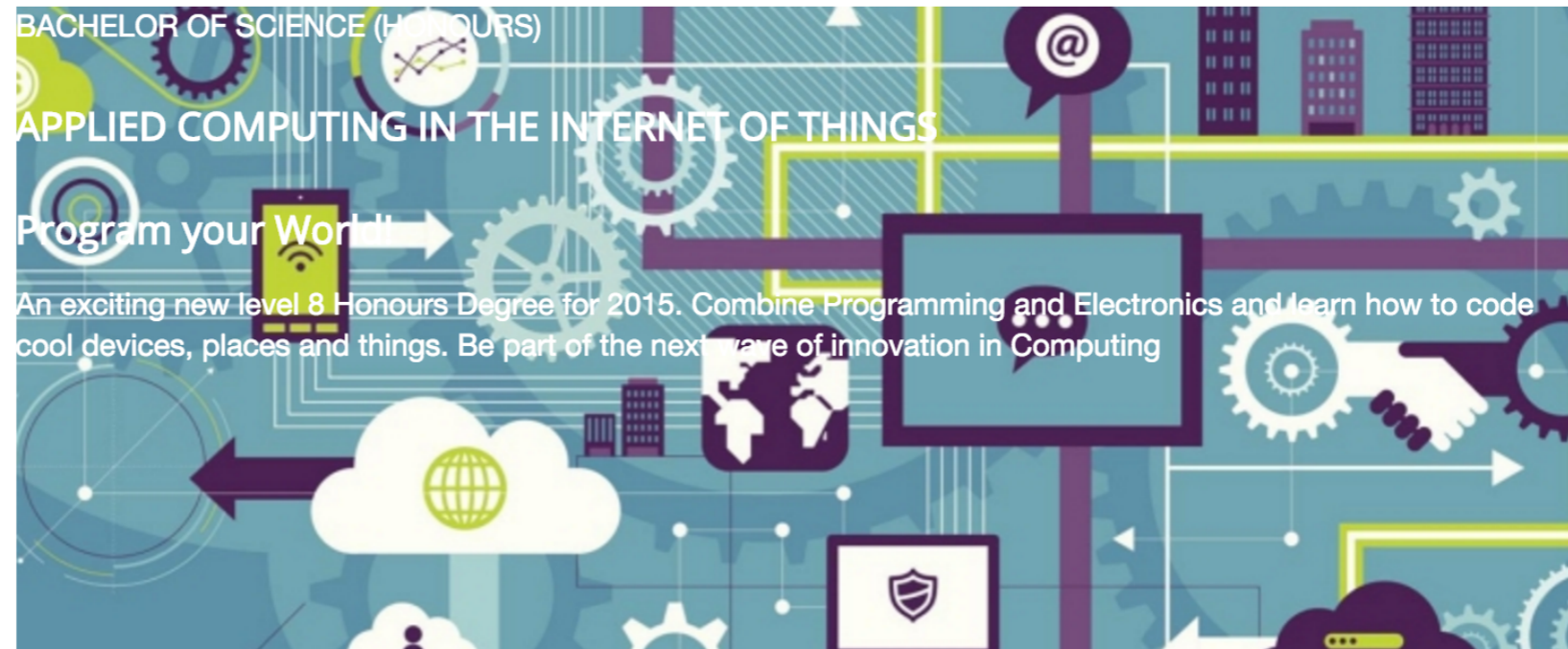
- We could have used 'ui row' as well, but just using cols will also suffice

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Banner
Segment
-current

background image

```
.banner {  
  background: url("/assets/images/banner.jpg") top center;  
  background-position: top center;  
  color: white;  
  height: 300px;  
}
```

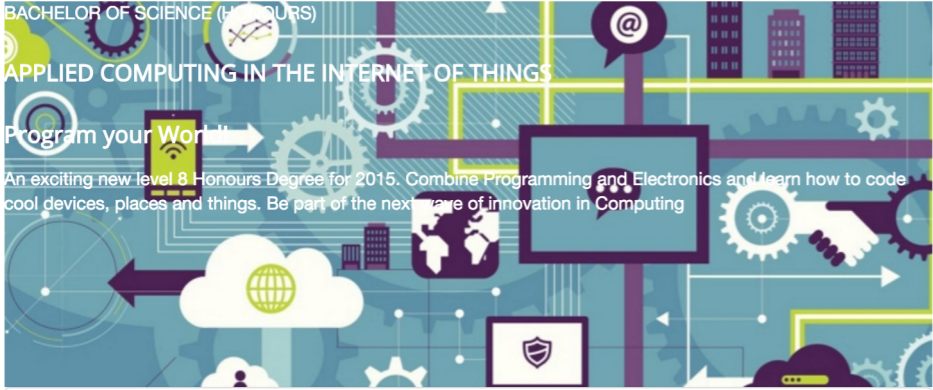
```
<!DOCTYPE html>  
<html lang="en">  
<head>  
  <meta charset="UTF-8">  
  <link rel="stylesheet" type="text/css" href="http://fonts.googleapis.com">  
  <link rel="stylesheet" href="assets/css/semantic.css">  
  <link type="text/css" rel="stylesheet" href="style.css" media="screen"/>  
  <title>BSc in the Internet of Things</title>  
</head>  
<body>  
  <section class="ui container">  
    current page  
    content  
  </section>  
</body>  
</html>
```

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```
<article class="banner">  
  <div>  
    <p>  
      BACHELOR OF SCIENCE (HONOURS)  
    </p>  
  
    <h3>  
      APPLIED COMPUTING IN THE INTERNET OF THINGS  
    </h3>  
  
    <h3>  
      Program your World!  
    </h3>  
  
    <p>  
      An exciting new level 8 Honours Degree for 2015. Combine Programming  
      to code cool devices, places and things. Be part of the next wave of  
    </p>  
  </div>  
</article>
```

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```
<body>
  <section class="ui container">
    ...header
  </section>
  <section class="banner">
    <section class="ui container">
      <section class="ui grid">
        <article class="ui seven wide column raised blue segment">
          ... existing banner section...
        </article>
      </section>
    </section>
  </section>
  <section class="ui container">
    curriculum
    sponsors
    footer sections.
  </section>
</body>
```

- Stretch the background image to the edges

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INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

BSc (Hons) the Internet of Things

BACHELOR OF SCIENCE (HONOURS)

APPLIED COMPUTING IN THE INTERNET OF THINGS

Program your World!

An exciting new level 8 Honours Degree for 2015. Combine Programming and Electronics and learn how to code cool devices, places and things. Be part of the next wave of innovation in Computing



Programming

Data Science

Devices

```

<section class="ui grid">
  <article class="ui seven wide column raised blue segment">
    <div>
      <p>
        BACHELOR OF SCIENCE (HONOURS)
      </p>

      <h3>
        APPLIED COMPUTING IN THE INTERNET OF THINGS
      </h3>

      <h3>
        Program your World!
      </h3>
      <p>
        An exciting new level 8 Honours Degree for 2015. Combine Programm
      </p>
    </div>
  </article>
</section>

```

Department of Computing & Mathematics



Waterford Institute of Technology
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Programming

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Devices

Computing & Mathematics



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BSc (Hons) the Internet of Things

Programmin

The IoT requires a new breed of software skills, with an emphasis on flexible, reactive, and highly networked applications and services. This software runs on a diverse range of systems, is frequently connected to cloud services, and may be capable of leveraging large data sets to deliver inferences and decision support in



BACHELOR OF SCIENCE (HONOURS)

APPLIED COMPUTING IN THE INTERNET OF THINGS

Program your World!

Program Data Devices

Learn a broad range of programming and problem solving skills, including exciting new platforms,

At the heart of many IoT applications is data: measurement events alarms and other information that must

The 'Things' we connect to are often physical devices. These can range from simple temperature sensors to

Unresponsive Layouts

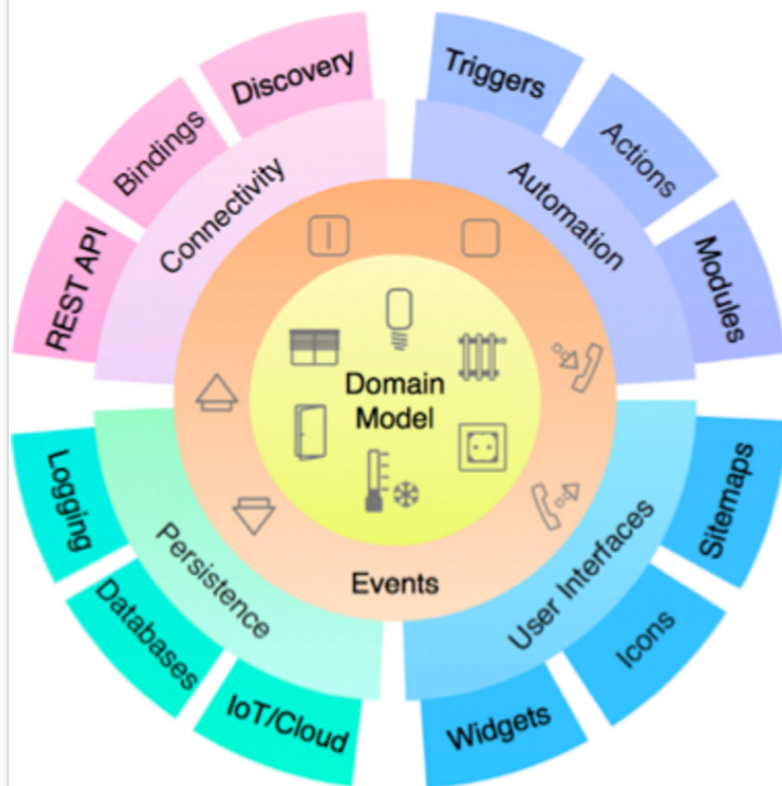
BSc (Hons) the Internet of Things



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Programming

The IoT requires a new breed of software skills, with an emphasis on flexible, reactive, and highly networked applications and services. This software runs on a diverse range of systems, is frequently connected to cloud services, and may be capable of leveraging large data sets to deliver inferences and decision support in an informed manner. The software is designed and implemented using agile techniques, with an emphasis on test driven development and quality user experiences..



Responsive Layouts

Programming

Learn a broad range of programming and problem solving skills, including exciting new platforms, software tools and languages. Use these skills to build apps for mobile, cloud and device based IoT applications. Evolve a portfolio of fascinating applications.



Data Science

At the heart of many IoT applications is data: measurements, events alarms and other information that must be relayed, stored and ultimately turned into knowledge. Learn the fundamentals of modern approaches to data in this strand.



Devices

The 'Things' we connect to are often physical devices. These can range from simple temperature sensors to sophisticated control systems like traffic lights or cameras. Connecting to and interacting with the physical world is the subject of this strand.



Networks

This strand will explore modern networks and cloud technology. Be able to configure, network and manage all categories of computer systems from simple controllers to single board computers, mobiles and full workstations.

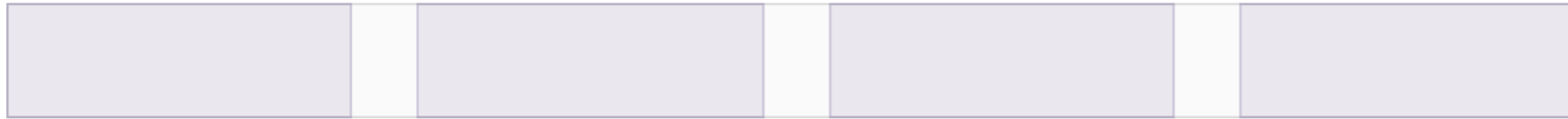


Grids

A grid is a structure with a [long history](#) used to align negative space in designs.

Using a grid makes content appear to flow more naturally on your page.

Toggle Animation



Columns

Grids divide horizontal space into indivisible units called "columns". All columns in a grid must specify their width as proportion of the total available row width.

All grid systems chooses an arbitrary column count to allow per row. Semantic's default theme uses **16 columns**



Grid

Introduction

Grids

Columns

Rows

Gutters

Negative Margins

Page Grids

Columns

Rows

Varying Grids

Responsive Grids

Containers

Stackable

Reverse Order

Doubling

Manual Tweaks




Responsive Grids

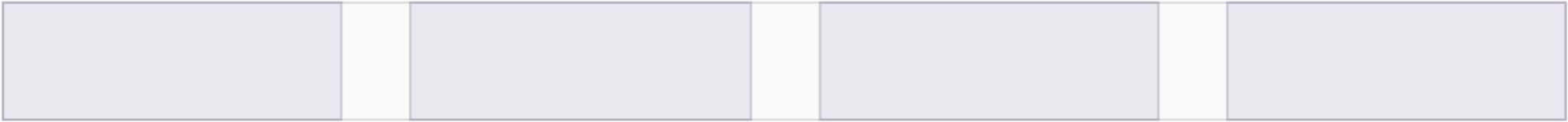
<http://semantic-ui.com/collections/grid.html>

Stackable



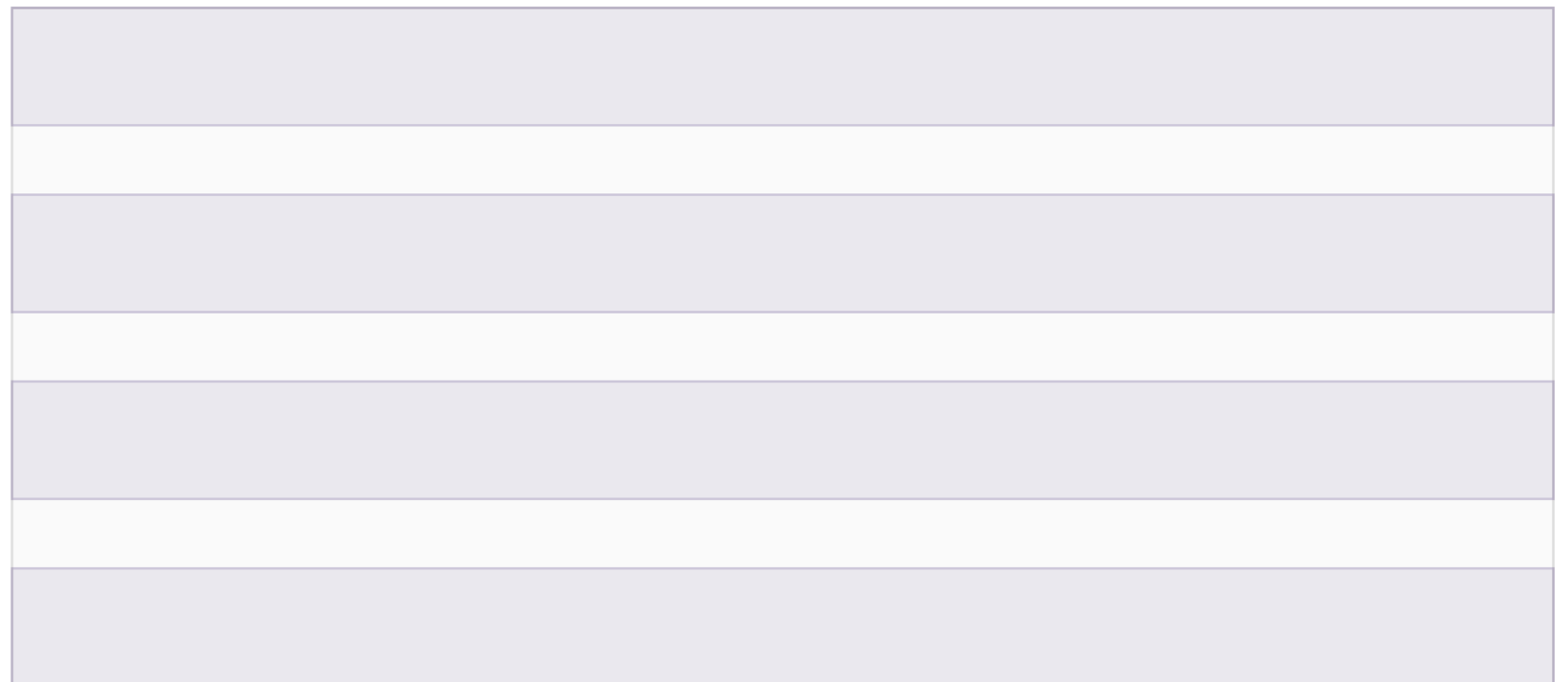
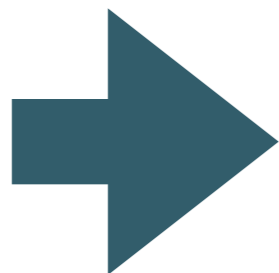
A stackable grid will automatically stack rows to a single columns on mobile devices

Example 



```
<div class="ui stackable four column grid">  
  <div class="column"></div>  
  <div class="column"></div>  
  <div class="column"></div>  
  <div class="column"></div>  
</div>
```

- Grid elements 'stackable' if the browser width to narrow

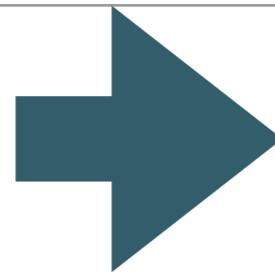


Computing & Mathematics



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```
<header class="ui two column center aligned middle aligned stacked stackable grid segment">  
  <div class="column">  
    <h2 class="ui header"> Department of Computing & Mathematics </h2>  
    <h3 class="ui header"> BSc (Hons) the Internet of Things </h3>  
  </div>  
  <div class="column">  
    <p>  
        
    </p>  
  </div>  
</header>
```

- Distinguish between 'stackable' and 'stacked'?

Programming

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Stackable

```
<section class="ui three column padded stacked stackable grid segment">
  <article class="red column">
    <h2> Programming </h2>
    <p>
      Learn a broad range of programming and problem solving skills, including
      software tools and languages. Use these skills to build apps for mobile
      IoT applications. Evolve a portfolio of fascinating applications.
    </p>
    <div class="ui two column grid">
      <div class="left aligned column">
        <i class="huge settings icon"></i>
      </div>
      <div class="right aligned column">
        <a href="strands/programming.html">
          <i class="huge sign in icon"></i>
        </a>
      </div>
    </div>
  </article>
</section>
```

- 'stackable grid' class makes all columns in the grid stack up as browser narrows

Stackable Strand Pages

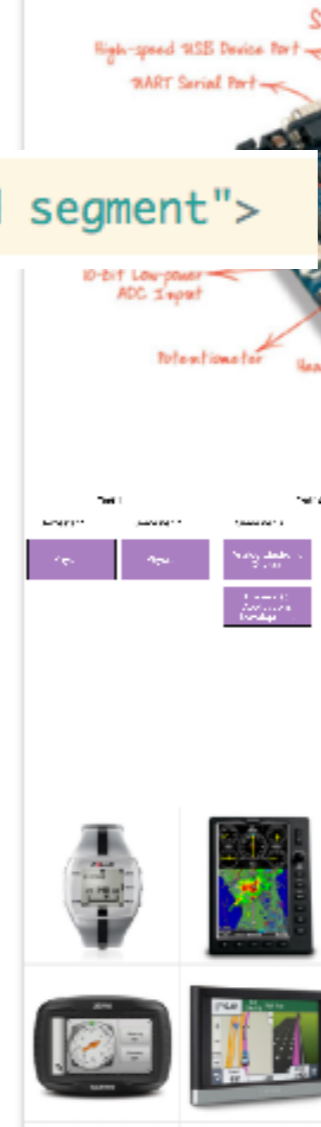


```
<section class="ui three column padded stacked stackable grid segment">
```

- All strand pages now responsive

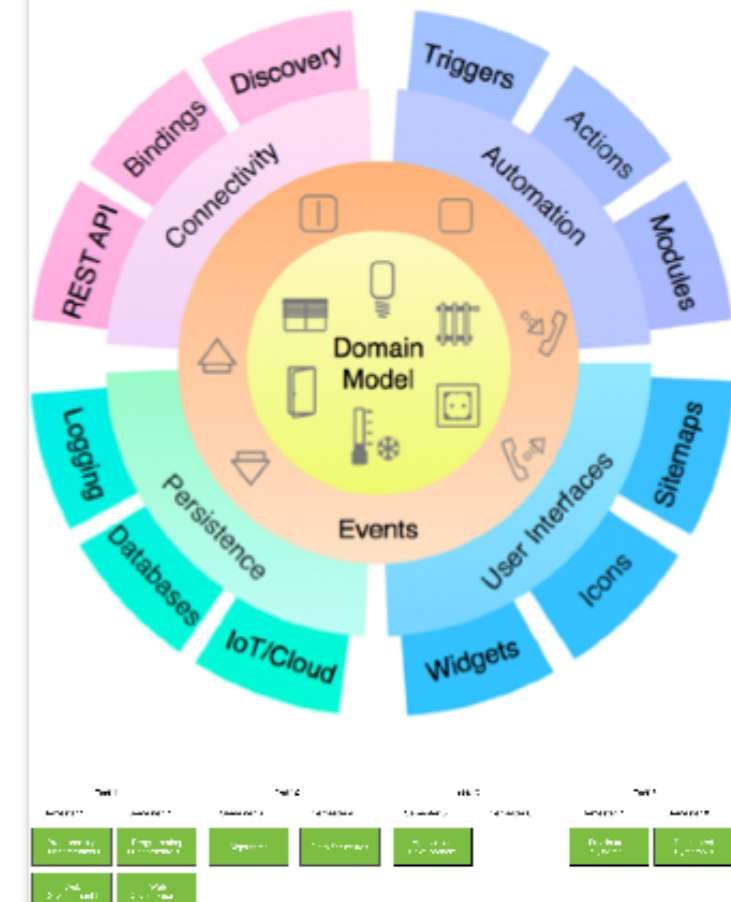
Devices

The IoT professional must be comfortable when dealing with the many kinds of devices and systems that are the means for the Internet to interact with the environment. Such an awareness of the devices and systems made to perform we attributes may be ch



Programming

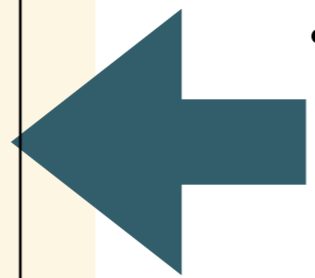
The IoT requires a new breed of software skills, with an emphasis on flexible, reactive, and highly networked applications and services. This software runs on a diverse range of systems, is frequently connected to cloud services, and may be capable of leveraging large data sets to deliver inferences and decision support in an informed manner. The software is designed and implemented using agile techniques, with an emphasis on test driven development and quality user experiences..



```
if (empty($vars['classes_array']))  
    // Since the title and the shortcut link are  
    // positioning them next to each other is much  
    // easier if we use the title_prefix and title_suffix  
    // attributes. We'll use the title_prefix and title_suffix  
    // attributes to wrap the title and the shortcut link  
    // in a single wrapper class.  
    $vars['classes_array'] = array('shortcut-wrapper clearfix');
```

Semantic-UI Libraries

```
├─ public
│   └─ assets
│       └─ images
│           ├── automotive.png
│           ├── banner.jpg
│           ├── ctrg.png
│           └─ iot
│
│   ...
│
│   └─ semantic
│       ├── LICENSE
│       ├── README.md
│       ├── components
│       │   └─ accordion.css
│       │
│       │   ....
│       │
│       │   ....
│       ├── package.js
│       ├── package.json
│       ├── semantic.css
│       ├── semantic.js
│       ├── semantic.min.css
│       ├── semantic.min.js
│       └─ themes
│
│   ├── index.html
│   ├── strands
│   │   ├── data.html
│   │   ├── devices.html
│   │   ├── maths.html
│   │   ├── networks.html
│   │   ├── programming.html
│   │   └─ project.html
│   └─ style.css
```



- This is the library:
- semantic.css
- + a set of icons and other assets
- The project is not heavily dependent on these files

- semantic.css is linked from all pages:

```
<link rel="stylesheet" href="/assets/css/semantic.css">
```


Alternative Mechanisms for Linking Semantic.css

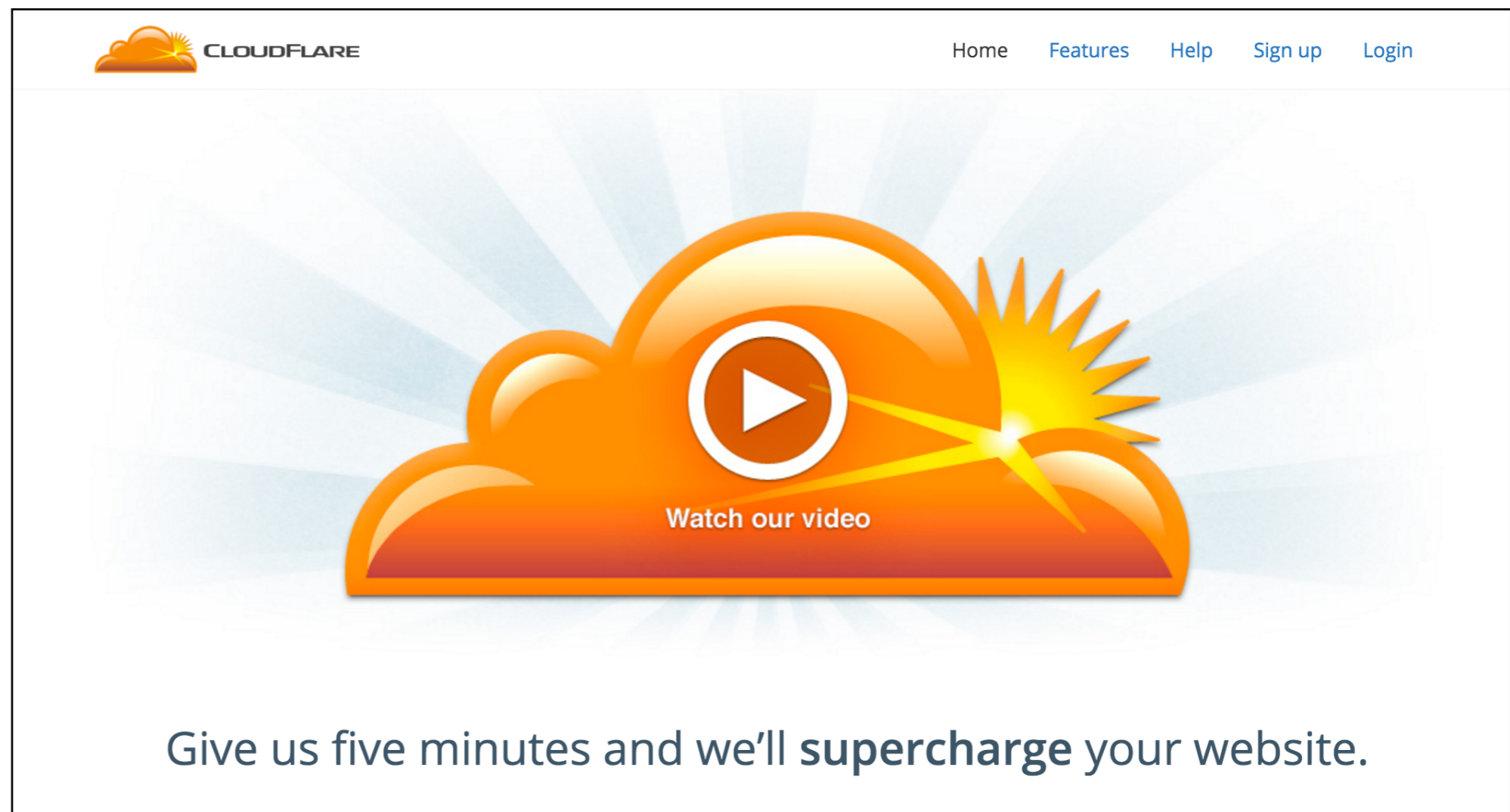
- Replace

```
<link rel="stylesheet" href="/assets/css/semantic.css">
```

- With

```
<link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/semantic-ui/2.1.6/semantic.min.css" type="text/css">  
<script type="text/javascript" src="http://cdnjs.cloudflare.com/ajax/libs/jquery/2.0.3/jquery.min.js"></script>  
<script type="text/javascript" src="https://cdnjs.cloudflare.com/ajax/libs/semantic-ui/2.1.6/semantic.min.js"></script>
```

- Cloud flare is a Content Delivery Network (CDN)
- It hosts many common libraries and assets in the cloud, simplifying access



class =“ui container”

class =“ui segment”

class =“ui header”

class =“ui image”

class =“ui grid”

class =“ui row”

class =“ui column”

class =“ui table”

class =“ui icon”

Summary of Classes (encountered so far)

Variations: grid

stackable, {number} column (*16 for full row*)

Variations: segment

raised, stacked, padded, left/center/right aligned,
top/middle/bottom aligned, {colour}

Variations: table

striped, single line, celled, collapsing

Variations: sizes of image & icon

mini, tiny, small, medium, large, big, huge, massive