



# MAHARISHI UNIVERSITY OF MANAGEMENT

*Higher Consciousness  
and Professional Excellence*

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## Web Application Programming Infinity and a Point

CS472  
July 2019

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Rakesh Shrestha, M.S.

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2019

Maharishi's Ninth Year of Invincibility –  
Global Raam Raj

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**CS472 - Web Application Programming: Infinity and a Point**  
 Creating web applications using various backend and frontend technologies (HTML, CSS, JS, JSP & Servlets)  
**July 2019**

## Course Overview

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Theme I: HTML and CSS - The Nature of Life is to Grow – Life is structured in layers						
<b>Week 1</b>	Web & HTML	CSS for Styling	Page Layout using CSS	HTML5 Forms & Regular Expressions	JavaScript Basics	Scope & Scope Chain + ES6
Theme II: Client-Side Programming - Purification Leads to Progress						
<b>Week 2</b>	Closures & Events	JavaScript Inheritance	jQuery	AJAX	Servlet Introduction	Review
Theme III: Server-Side Programming with Servlets and JSP - Every Action has a Reaction						
<b>Week 3</b>	Midterm Exam	State Management	JavaServerPages (JSP)	JSP CustomTags	Project (JAKSON API)	Project
Theme IV: Integrating all parts together - The Whole is Greater than the Sum of the Parts						
<b>Week 4</b>	Project	Project Presentation	Review	Final Exam		

**Web Application Programming: Infinity and a Point**

**CS472**

# **Web Application Programming**

**Infinity and a Point**

July 2019

Rakesh Shrestha, M.S.

## **COURSE GOAL**

This course provides a systematic introduction to programming interactive and dynamic web applications for individuals with little or no prior web application programming experience.

## **Course Objectives**

1. Gain a working knowledge of the fundamentals of HTML to specify webpage content.
2. Learn the basics of CSS to specify website styling and layout.
3. Gain a deep understanding of the Javascript language for making webpages more responsive.
4. Develop skill in using the *jQuery* Library to access the Document Object Model.
5. Have knowledge and experience with Servlets and Java Server Pages for creating dynamism in websites.

## Evaluation Criteria

Midterm Exam	40%
Final Exam	40%
Labs and Homeworks	5%
Final Project	15%
Attendance & Professional Etiquette - <b>Required</b>	

\* See morning mediation policy for extra credit.

## Course Texts

*A Software Engineer Learns HTML5 JavaScript & jQuery: A Guide to standards-Based Web Applications* by D. Cameron, Cisdal Publishing, 2014.

*Head First Servlets and JSP, Second Edition*  
by Basham, Sierra, Bates  
O'Reilly Media, 2008.

## Course Website

<http://mumstudents.org/cs472/2019-07-RS/>

## **Class Attendance**

Attendance at all classes is required, because all elements of class — lectures, questions and answers, discussions, laboratory work — contribute to the learning process. Absences are usually excused only if you are sick in bed or have a family emergency.

If you must miss a class, please let your instructor know ahead of time. Call, send an email, or send a note with a friend. There is no such thing as a “personal day.” If you have personal business to take care of, please schedule it for after class or during the days between blocks. At the same time, it may occasionally be necessary for you to miss a class (or part of a class) for some reason other than illness or family emergency. Please speak with the instructor beforehand, who will be open to considering your needs.

The first lesson of each course is the most important. Students are expected to be present from the first lesson onward. Any student not present on the first morning (except for such compelling reasons as illness or family emergency) may be asked to withdraw from the course. Unexcused absences may result in the student receiving a grade of NC (No Credit) for the whole course.

## **Morning Meditation Policy**

Students need to attend 60% of the Dalby morning meditations over the aggregate of their regular computer science courses in order to graduate. Attendance during SCI and Forest Academy courses must be 80% or more.

Students may earn extra credit towards their final grade in a computer science course if they have outstanding attendance at the morning meditations for any specific computer science block.

- 70% and above: .5% EC (16 days in a standard block)
- 80% and above: 1% EC (18 days in a standard block)
- 90% and above: 1.5% EC (20 days in a standard block)

Details: For a given block 60% of 22 days would be 14 days or more. They can attend fewer than that some blocks if they make up the difference in other blocks. Attendance deficiencies can be remedied by participating in TM Retreats either on campus or in the field. A 3-day retreat will count for 15 meditations, 4 day for 20 meditations, 5 day for 25 meditations, etc.

## Introduction to Web Programming

In this lecture we introduce the basic technologies that make up the Internet, the World Wide Web and the Hyper Text Markup Language (HTML). We will see that many technologies are built on top of other technologies. *Life is found in layers.*

### MAIN POINTS

1. The internet is a global computer network that uses the IP protocol to uniquely identify computers on the network. Through the TCP protocol each IP address can work with multiple services at the same time. One of these services is the HTTP protocol which is used by the World Wide Web to transport HTML pages. These are the different layers of the internet. *The benefit of TM is that it settles the mind so that it more easily becomes aware of the deeper layers affecting the relative.*
2. The Hyper Text Markup Language uses tags to demarcate different sections of a text and we know that the HTML page always starts with a <html> tag, inside of which it has a <head> tag to describe the page, and a <body> tag of the contents that will actually be displayed. **Science of Consciousness:** *Seek the highest first, by starting with a good foundation and building upon that.*
3. By properly adhering to web standards we can assure better results across more platforms, and it is more likely that our page will continue to display properly in the future. By clearly stating what standard we adhere to every browser that supports the standard (now and in the future) will be able to correctly display our page. *The nature of life is to grow.*
4. We discussed some of the most common tags used on pages, including headings, paragraphs, images, and links. The most important concept to take away is to use tags based on their semantics (meaning), not based on their visual effect (which can easily be changed). By using tags for their meaning, clients (including non visual) will be better able to understand the meaning of your page. *The benefits of TM include a clearer understanding of deeper principles of life, allowing us to more easily take the right actions to achieve a desired result.*

### CONNECTING THE PARTS OF KNOWLEDGE WITH THE WHOLENESS OF KNOWLEDGE

The basics of the web

1. HTML is the basis of Web Programming, every web page is made of HTML.
2. To be a proper web programmer you also have to understand the deeper underlying realities of HTTP, TCP, and DNS.

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3. **Transcendental consciousness** is when our mind is in contact with the deepest underlying reality, the unified field.
  4. **Impulses within the Transcendental field:** the infinitely dynamism of the unified field constantly expresses itself and becomes all aspects of the universe.
  5. **Wholeness moving within itself:** In Unity Consciousness, one experiences that this infinite dynamism is nothing but the self.



## CSS for Styling

In this lecture we introduce the basics of CSS as a way to give different visual styles to HTML elements, changing their preset default appearance. *The nature of life is to grow.*

### MAIN POINTS

1. Cascading Style Sheets (CSS) provide a way for web developers to specify the appearance of content on the page by using selectors to specify the element(s), and then the values that properties of those elements (like font or color) should have. It is a best practice to keep CSS in a separate file, doing so makes your pages more flexible. *Purification leads to progress.*
2. The CSS Properties for color, font, text, background, and lists, are the basic properties used on almost every page. **Science of Consiousness:** *The basic constituent of human life is the field of pure intelligence which gives rise to the full diversity of human experience. When our awareness is established in this field, then our experience is blissful.*
3. The Cascading in CSS indicates that there are multiple levels of style sheets, the more specific styles overwriting the more general styles. We can be more specific by using Class selectors (groups of elements), and even more with id selectors (individual element). **Science of Consiousness:** *Life is found in layers; we enrich our life by experiencing all the layers. By experiencing Transcendental Consciousness regularly, we increasingly experience all layers of nature from the basis to the surface.*

**Improvement in Academic Skills** Within one school year, elementary school students who practiced the Transcendental Meditation program showed significant gains on a nationally standardized test of basic skills. **Reference:** *Education 107: 49–54, 1986.*

**Increased Creativity Individuals** who learned Maharishi's Transcendental Meditation program showed increased creativity in comparison to controls as measured by a higher level of pictorial originality when measured after five months of practice. They also showed increased creativity as measured by higher levels of pictorial flexibility and verbal fluency (not charted). **Reference:** *The Journal of Creative Behavior 13: 169–180, 1979.*

### CONNECTING THE PARTS OF KNOWLEDGE WITH THE WHOLENESS OF KNOWLEDGE

#### Changing Appearances

1. How a page is displayed is affected by both the HTML and the CSS.
  2. Although every HTML tag has a default way of displaying, it can easily be changed with CSS and should never be the basis for using it. Instead use HTML tags based on meaning.
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3. **Transcendental consciousness** is the field that underlies all differences.
  4. **Impulses within the Transcendental field:** the unbounded diversity of the unified field provides for many ways to do the same thing in the relative.
  5. **Wholeness moving within itself:** In Unity Consciousness, one experiences that this unbounded diversity is nothing but the self.





## Page Layout

In this lecture we will discuss the different tools CSS provides for creating a layout. There are a variety of ways to position an element; most of them are based on taking a block level element and placing it in relation to some other block. It is this relationship that becomes the tricky part. The question is always: “What is this positioned to”. *The whole is greater than the sum of its parts.*

### MAIN POINTS

1. The <div> tag provides a generic block level element that can be used for any division or section of your page. The <span> tag provides a generic inline element for specifying any range of text inside a box. By using these tags, combined with CSS context selectors (direct child or ascendant) we can write CSS rules that are general enough to be re-used, while still being specific enough not to create confusion. *TM allows our mind to transcend the finest levels of awareness while our body remains in the relative, providing a perspective on the coexistence of opposites.*
2. The Box Model is a description of how every element has a basic width and height, outside of which it has padding, a border, and margin. For inline elements only the left and right margin and padding affect surrounding elements. You can use web development tools like firebug to inspect the box model for each element. *Harmony exists in diversity.*
3. The CSS float property makes its element move to right or left side of the containing box. The clear property moves its element downwards if there is a floating element on the specified side. This is the easiest way to make something appear on the right or left side. *Do less and accomplish more.*
4. Static positioning flows box elements from top to bottom, and inline elements from left to right. Relative positioning keeps the space in the original flow, but displays the element at an offset. Absolute positioning takes the element out of the flow and places it relative to the ‘containing element’. Fixed positioning takes the element out of the flow and places it relative to the browser window. *Transcendental consciousness is when our mind goes outside the window of the relative.*

### CONNECTING THE PARTS OF KNOWLEDGE WITH THE WHOLENESS OF KNOWLEDGE

#### CSS Positioning

1. You can use floats and positioning to change where elements are displayed.
  2. The entire visual appearance of a page can be completely altered using different style sheets.
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3. **Transcendental consciousness** allows us to experience the unity within diversity.
  4. **Impulses within the Transcendental field:** The self interacting dynamics of the unified field create diversity from unity.
  5. **Wholeness moving within itself:** In Unity Consciousness, one experiences this self interacting dynamics as an aspect of one’s person self.



## HTML Forms

In this lecture we will discuss how to generate and process user input. On the client side we will create HTML forms with different types of widgets that allow the users to submit different types of data, and on the server side we will look at processing these different types of data. *Life is found in layers.*

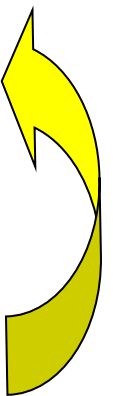
### MAIN POINTS

1. An HTML form allows the user to send data (parameters) to the server. Forms are created with the <form> tag, and can be submitted with either an HTTP GET or POST method. *Every action has a reaction.*
2. HTML provides many different types of input widgets, including text fields, text areas, check boxes, radio buttons, and dropdown lists, this is also an area html 5 is expanding. *Harmony exists in diversity.*
3. Although data can be submitted with a GET request, the fact that it's on the URL makes it clumsy and less secure (not what GET is meant for). Instead data should be submitted with a POST request, which is specifically meant for taking data, and keeps things clean. *Like the principle of diving, we want to take the right angle and let go.*

### CONNECTING THE PARTS OF KNOWLEDGE WITH THE WHOLENESS OF KNOWLEDGE

#### Working with User Input

1. Forms let us submit data to the web server, which can then generate a custom response.
  2. It is important to distinguish between GET requests with parameters to specify what exactly is desired, and POST requests that submit data and are not requesting a direct response.
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3. **Transcendental consciousness** allows the mind to settle into pure silence, beyond the duality of action and reaction, input and output.
  4. **Impulses within the Transcendental field:** duality is created as the boundless interacts with itself, creating the impression of this and that.
  5. **Wholeness moving within itself:** In Unity Consciousness, one becomes aware that the Self is nothing but the boundless unity.



## JavaScript for Modern Web Apps: Spontaneous Right Action

JavaScript is a powerful lightweight, loosely typed, interpreted, functional, OO language that makes web pages highly dynamic and responsive. It runs in all browsers and is an increasingly important programming language. *Science of Consciousness:* If our awareness is grounded in pure consciousness then our actions will be dynamic and responsive.

### MAIN POINTS

1. JavaScript programs have no main. They respond to user actions called events. *Science of Consciousness:* We respond most effectively to events in our environment if our awareness is settled and alert.
2. The purpose of most JavaScript code is to manipulate the HTML DOM, which is a set of JavaScript objects that represent each element on an HTML page. *Science of Consciousness:* The purpose of most thoughts is to produce successful actions and achievements in the world, and more powerful thoughts will produce more successful actions.
3. JavaScript is a loosely typed language. It has types, but does no compile time type checking. Programmers must be cautious of automatic type conversions, including conversions to Boolean types. It has a flexible and powerful array type as well as distinct types of null and undefined. *Science of Consciousness:* If our awareness is established in the source of all the laws of nature then our actions will spontaneously be in accord with the laws of nature for a particular environment.

### CONNECTING THE PARTS OF KNOWLEDGE WITH THE WHOLENESS OF KNOWLEDGE

JavaScript for Modern Web Apps: Spontaneous Right Action

1. JavaScript code comes with an HTML page and is executed on the browser.
  2. JavaScript reacts to browser events and manipulates the web page using the HTML DOM API.
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3. **Transcendental consciousness** is the source of thought and the home of all the laws of nature.
  4. **Impulses within the Transcendental field:** Thoughts arising from this level will spontaneously be in accord with all the laws of nature.
  5. **Wholeness moving within itself:** In unity consciousness, one appreciates that all events and responses are the play and display of non-changing pure consciousness.



## The JavaScript Programming Environment Actions in Accord with the Laws of Nature

With web applications, JavaScript runs in the environment of a browser. Understanding this special programming environment is critical to success. ***Science of Consciousness:*** If our thoughts are connected to the home of all the laws of nature, then one will naturally behave according to the principles appropriate for any special environment.

### MAIN POINTS

1. JavaScript has a set of global DOM objects accessible to every web page. Every JavaScript object runs inside the global window object. The window object has many global functions such as alert and timer methods. ***Science of Consciousness:*** To be successful we must have both fine discrimination and broad awareness. The experience of pure consciousness provides global awareness, but also enhances our ability to have fine focus and make careful discriminations.
2. “Unobtrusive” JavaScript promotes separation of web page content into 3 different concerns: content (HTML), presentation (CSS), and behavior(JS). ***Science of Consciousness:*** This is another example of knower (model), known (view), and process of knowing (controller) which is found throughout computer science and nature. When we experience transcendental consciousness, our Self is the knower, and it is also the known, and the experience is itself the process of the knower knowing itself.
3. JavaScript code runs when the page loads it. Event handlers cannot be assigned until the target elements are loaded. Event handlers often use anonymous functions because the code is specific to that event and element. ***Science of Consciousness:*** Creative intelligence proceeds in an orderly sequential manner. When our thoughts and actions arise from the source of all the laws of nature then we spontaneously act in accord with the natural order of events in nature.
4. The DOM is an API so the JavaScript programmer can conveniently access and manipulate the HTML elements in code. ***Science of Consciousness:*** The TM and TM-Sidhi programs are techniques that allow anyone to conveniently contact and act at the level of the Unified Field.

## Web Application Programming: Infinity and a Point

### CONNECTING THE PARTS OF KNOWLEDGE WITH THE WHOLENESS OF KNOWLEDGE

The JavaScript Programming Environment:  
Actions in Accord with the Laws of Nature

1. JavaScript code comes with an HTML page and is executed on the browser.
  2. JavaScript reacts to browser events and manipulates the web page using the HTML DOM API.
- 
3. **Transcendental consciousness** is the source of thought and the home of all the laws of nature.
  4. **Impulses within the Transcendental field:** spontaneously are in accord with all the laws of nature.
  5. **Wholeness moving within itself:** In unity consciousness, one enjoys all perceptions and knowledge in terms of the source of all the laws of nature, pure bliss consciousness. This is parallel to the bliss and confidence that we experience when we have a deep appreciation and understanding of the environment in which JavaScript runs.

