PMC2127 - INNOVATIVE INITIATIVES

Total Instructional Hours : 36 Instructional Hours/Week : 2 Credits: 1

Course Outcomes (CO):

Upon successful completion of this course, students should be able to:

PMC2127.01	Integrate the technological and industrial knowledge gathered (Target 50)
PMC2127.02	Reflect on experiences of creativity and innovation at work (Target 60)
PMC2127.03	Experience the ethical side of paper publishing and international certification (Target 50)

General Notes :

1. **Innovative initiative primarily aims at either**
   Getting an international certification or
   Publishing a research paper or
   Doing a live project

   Guidelines

   In order to earn the credit through an innovative initiative performed during the tenure of the program. A panel of faculty members appointed by the department council will assess the innovative initiative. The student should specify the innovative initiative and get the approval within ten days after the commencement of the semester. Any change in the innovative initiative should get the approval of a panel of faculty members appointed on demand by the department council and the change will be allowed only within a month after the first approval. Single credit will be awarded irrespective of the number of innovative initiatives. The criteria for the assessment of the innovative initiative will be published by the department council within three months after the commencement of the third semester

International certification		50 Marks
	Scope of employability Marks obtained for evaluation Duration	
Research paper		50 Marks
	Scope of the paper Relevance of the paper	
Live project		50 marks

	Completeness Documentation Coding standards	

PMC2128A - WEB PROGRAMMING USING PHP

Total Instructional Hours : 36 Instructional Hours/Week : 2 Credits :1

Course Outcomes (CO):

Upon successful completion of this course, students should be able to:

PMC2128A.01	1 Analyze the basic concepts of internet technology (Target 50, Modules
PMC2128A.02	Develop a website using html, JavaScript and CSS (Target 50, Modules : M1,M2)
PMC2128A.03	3 Read, write and execute PHP programs (Target 50, Modules : M3)
PMC2128A.04	Develop PHP programs with database connectivity (Target 50, Modules : M4)
PMC2128A.05	5 Develop PHP application using a framework (Target 50, Modules : M5

Module 1: Introduction (3 Hours)

Internet Standards – Introduction to WWW – WWW Architecture – SMTP – POP3 – File Transfer Protocol - Overview of HTTP, HTTP request – response — Generation of dynamic web pages. Client side Scripting Vs Server side scripting HTML Introduction to HTML, HTML Tags, Creating Forms, Creating tables, Managing home page, Ethics in Web Programming..

Module 2: CSS and JavaScript (3 Hours)

Introduction to CSS, Three ways to use CSS, CSS Properties, Designing website, Working with Templates, Introduction to JavaScript, Three ways to use JavaScript, Working with events, Client-side Validation.

Module 3: PHP Basics (10 Hours)

PHP Basics- Syntax, Operators, Variables, Constants, Control Structures, Language Constructs and Functions. Functions- Syntax, Arguments, Variables, References, Returns, Variable Scope Arrays- Enumerated Arrays, Associative Arrays, Array Iteration, Multi Dimensional Arrays, Array Functions, SPL Object Oriented Programming- Instantiation, Modifiers/Inheritance, Interfaces, Exceptions, Static Methods and Properties, Auto load, Reflection, Type Hinting, Class Constants.

Module 4: Strings and Patterns (10 Hours)

Strings and Patterns- Quoting, Matching, Extracting, Searching, Replacing, Formatting Web Features- Sessions, Forms, GET and POST data, Cookies, HTTP Headers Databases and SQL - SQL, Joins, Analysing Queries, Prepared Statements, Transactions. Streams and Network Programming- Files, Reading, Writing, File System Functions, Streams.

Module 5: Case study on latest framework (10 Hours)

Introduction to Model, View and Controllers, Architecture of Framework, Application development using framework.

Book of Study :

1. Harvey Deitel and Abbey Deitel, “Internet and World Wide Web - How To Program”, Fifth Edition, Pearson, Education, 2011.

2. Achyut S Godbole and AtulKahate, “Web Technologies”, Second Edition, Tata McGraw Hill, 2012.

3. Eli Orr and Yehuda Zadik, “Programming with CodeIgniter MVC”, Packt Publishing, 2013 4. Thomas A Powell, Fritz Schneider, “JavaScript: The Complete Reference”, Third Edition, Tata McGraw Hill, 2013.

5. Professional PHP 6 Ed Lecky –Thompson, Steven D. Nowicki, Thomas Myer Wrox Publishers 6. PHP6 and MySQL Bible – Steve Suehring, Tim Converse and Joyce Park, Wiley India Pvt.Ltd 7. Adam Griffiths , CodeIgniter 1.7 Professional Development, Packt Publishing,2010

Scheme of Evaluation :

The Assessment will be either written or administered through electronic device/means. Three continuous assessments will be conducted for the assessment.

Sl. No	Components of CAE	Marks
1	**Continuous Assessment Examination**	
2	Assessment 1 (Certification or MCQ)	10 Marks
3	Assessment 2 (Written Exam)	20 Marks
4	Assessment 3 (Viva)	20 Marks
	Total	**50 marks**

BoS, P G Department of Computer Applications

PMC2128B - HIGH PERFORMANCE CODING WITH .NET Total Instructional Hours : 36 Instructional Hours/Week : 2 Credits :1

Course Outcomes (CO):

Upon successful completion of this course, students should be able to:

	1 Adding a Project into GIT (Target 80, Modules : M1)
	2 Understand MVC Architecture of .net (Target 60, Modules :
	3 Understand How to work with data (Target 55, Modules : M3)
	4 Learn How to Build Front End (Target 40, Modules : M4)

Module 1: Introduction to GIT (7 Hours)

Overview of the MVC Pattern Overview of ASP.NET Updates to VS ASP.NET MVC Creating a Project Adding a Project into GIT - .

Module 2: ASP.net MVC Basic (7 Hours)

Routes, Areas and Controllers Preview Views and Layouts View Models Authorization in ASP.NET Scripts, Styles and Bundles Admin Layout - .

Module 3: Working With Data (15 Hours)

Versioning Database with Fluent Migrator Overview of nHibernate Installing MySQL Driver Creating User Entity Creating User Admin Database Driven Auth in ASP.NET Preventing CSRF (Cross-site Request Forgery) Attacks Adding Roles into the User Admin Post and Tag Data Model Pagination for Posts Admin New and Edit Forms for Posts Soft Deletion for Posts Post Tag Editor Select N+ - .

Module 4: Building Front End (7 Hours)

Introduction to jQuery jQuery Syntax, jQuery Selectors, jQuery Events, jQuery Effects, jQuery HTML, jQuery Traversing, jQuery AJAX & Misc - .

References :

1. https://www.udemy.com/course/net-basic-course-introduction-to-net-with-csharp-programming/ https://www.edx.org/learn/.net https://dotnet.microsoft.com/learn

Scheme of Evaluation :

1. The Assessment will be either written or administered through electronic device/means. Three continuous assessments will be conducted for the assessment.

Sl. No	Components of CAE	Marks

1	**Continuous Assessment Examination**	
	Assessment 1 (Certification or MCQ)	10 Marks
	Assessment 2 (Written Exam)	20 Marks
	Assessment 3 (Viva)	20 Marks
	Total	**50 marks**

PMC 2128C - MOBILE APP DEVELOPMENT

Total Instructional Hours : 36 Instructional Hours/Week : 2 Credits :1

Course Outcomes (CO):

Upon successful completion of this course, students should be able to:

	1 Build a basic Android Project (Target 100, Modules : M1)
PMC2128C.02	Develop a basic android application with different Layouts and controls (Target 80, Modules : M2)

Module 1: Overview (16 Hours)

Create and Run First Android Application - .Android Platform Architecture - .Android App Folder Structure - .Basics of an Android Application - .

Module 2: Graphical User Interface (20 Hours)

Activities and intents - .Different Layouts - .Various Views - .Menus and User Navigation - .Recycler View - .

References :

1. Head First Android Development: A Brain-riendly Guide, Edition 2, Dawn Griffiths, David Griffiths, 2017 ,"O'Reilly Media, Inc."
Android Programming: The Big Nerd Ranch Guide , Bill Philips & Brian Hardy

Suggested Reading :

1. Android Application Development All-in-One For Dummies, Barry Burd

Internet Study Material :

1. https://developer.android.com/guide

Scheme of Evaluation :

1. The Assessment will be either written or administered through electronic device/means. Three continuous assessments will be conducted for the assessment.

Sl. No	Components of CAE	Marks
1	**Continuous Assessment Examination**	
	Assessment 1 (Certification or MCQ)	10 Marks
	Assessment 2 (Written Exam)	20 Marks
	Assessment 3 (Viva)	20 Marks
	Total	**50 marks**

PMC2128D - JAVASCRIPT

Total Instructional Hours : 36 Instructional Hours/Week : 2 Credits :1

Course Outcomes (CO):

Upon successful completion of this course, students should be able to:

PMC2128D.01	Write Simple Scripts (Target 100, Modules : M1)
PMC2128D.02	Write scripts containing functions (Target 80, Modules : M1)

Module 1: Introduction to JavaScript (36 Hours)

Writing Simple Scripts - .Introducing Functions - .DOM Objects and Built-in Objects - Working with Character Strings - .Storing Data in Arrays - .Handling Events in JavaScript - .

Book of Study :

1. Sams Teach Yourself JavaScript in 24Hours,Seventh Edition

Scheme of Evaluation :

1. The Assessment will be either written or administered through electronic device/means. Three continuous assessments will be conducted for the assessment.

Sl. No	Components of CAE	Marks
1	**Continuous Assessment Examination**	
	Assessment 1 (Certification or MCQ)	10 Marks

	Assessment 2 (Written Exam)	20 Marks
	Assessment 3 (Viva)	20 Marks
	Total	**50 marks**

PMC2128E - DJANGO FRAMEWORK

Total Instructional Hours : 36 Instructional Hours/Week : 2 Credits :1

Course Outcomes (CO):

Upon successful completion of this course, students should be able to:

PMC2128E.01	Develop web applications using Django framework (Target 80, Modules : M1)

Module 1: Web Application Development with Django (36 Hours)

Creating a Django Project - .Django Architecture - .Django Modules - .Django Security Features - .

References :

1. Django for Beginners: Build websites with Python and Django ,William S Wincent
   Django for Professionals: Production websites with Python & Django, William S Wincent

Internet Study Material :

1. https://www.djangoproject.com/start/

Scheme of Evaluation :

1. The Assessment will be either written or administered through electronic device/means. Three continuous assessments will be conducted for the assessment.

Sl. No	Components of CAE	Marks
1	**Continuous Assessment Examination**	
	Assessment 1 (Certification or MCQ)	10 Marks
	Assessment 2 (Written Exam)	20 Marks
	Assessment 3 (Viva)	20 Marks

	Total	**50 marks**

PMC2128F - CLOUD COMPUTING WITH AZURE AND GCP Total Instructional Hours : 36 Instructional Hours/Week : 2 Credits :1

Course Outcomes(CO):

Upon successful completion of this course, students should be able to:

	Analyze the basic concepts of GCP (Target 50, Modules : M1)
	Evaluate the basic concepts of Azure (Target 50, Modules : M2

Module 1: Google Cloud Platform (18 Hours)

What is cloud computing, GCP computing architectures 1m, The Google network, GCP regions and zones. Open APIs, Why choose Google Cloud Platform, Multi-layered security approach, Virtual Private Cloud (VPC) Network. Compute Engine, Important VPC capabilities, Introduction to Google Cloud Platform, Storage Options, Cloud Storage. Cloud Storage interactions, Google Cloud Bigtable, Google Cloud SQL and Google Cloud Spanner, Google Cloud Data store .Comparing Storage Options, Cloud Storage, Cloud Bigtable, Cloud SQL and Cloud Spanner, Cloud Data store, Google Cloud Platform Storage Options.

Containers, Kubernetes, and Kubernetes Engine, Introduction to Kubernetes and GKE, Introduction to Hybrid and Multi-Cloud Computing (Anthos).Google App Engine Standard Environment, Google App Engine Flexible Environment, Google Cloud Endpoints and Apigee Edge.

Module 2: Microsoft Azure Fundamentals (18 Hours)

Azure concepts - Microsoft Azure - Home, Windows, Components, Compute Module. Fabric Controller, Storage, Blobs, Queues, Tables, CDN, Applications, Security, Datacenters. Azure services, Solutions and management tools on Azure, Security and network security features, Identity, governance, privacy, and compliance features. Azure cost management and service level agreements. Management Portal, Create Virtual Network, Deploying Virtual Machines, Endpoint Configuration Point-to-Site Connectivity, Site-to-Site Connectivity, Traffic Manager, PowerShell, Monitoring Virtual Machine, Setting Up Alert Rules. Application Deployment, Backup & Recovery, Self-Service Capabilities, Multi-Factor Authentication, Forefront Identity Manager, Data Import & Export Job.

Scheme of Evaluation :

1. The Assessment will be either written or administered through electronic device/means. Three continuous assessments will be conducted for the assessment.

Sl. No	Components of CAE	Marks
1	**Continuous Assessment Examination**	
	Assessment 1 (Certification or MCQ)	10 Marks
	Assessment 2 (Written Exam)	20 Marks
	Assessment 3 (Viva)	20 Marks
	Total	**50 marks**

PMC2128G - DEEP LEARNING FUNDAMENTALS

Total Instructional Hours : 36 Instructional Hours/Week : 2 Credits :1

Course Outcomes (CO):

Upon successful completion of this course, students should be able to:

PMC2128G.01	Analyze the basic concepts of deep learning (Target 50, Modules : M1)
PMC2128G.02	Compare the various deep learning architectures (Target 50, Modules : M2)
PMC2128G.03	Evaluate the various neural network concepts (Target 50, Modules : M3)

Module 1: Deep Learning (12 Hours)

Deep Learning, Rise of Deep Learning, Deep Learning in Action. Introduction to deep learning and applications, Neural networks, Deep learning platforms. Applications: Virtual Assistants, Chatbots, Healthcare, Entertainment, Robotic.

Module 2: Deep learning frameworks (12 Hours)

Deep learning frameworks, TensorFlow, Keras, PyTorch, Microsoft CNTK. Introduction to TensorFlow, Use case implementation using TensorFlow.

Module 3: Neural Networks (12 Hours)

Neural Networks, Introduction to CNN, How do CNNs recognize images, Layers in CNN. Artificial Neural Network, Recurrent Neural Network, Long Short Term Memory (LSTM), Generative Adversarial Networks.

Scheme of Evaluation :

1. The Assessment will be either written or administered through electronic device/means. Three continuous assessments will be conducted for the assessment.

Sl. No	Components of CAE	Marks
1	**Continuous Assessment Examination**	
	Assessment 1 (Certification or MCQ)	10 Marks
	Assessment 2 (Written Exam)	20 Marks
	Assessment 3 (Viva)	20 Marks
	Total	**50 marks**

PMC2128H - INTERNET OF THINGS

Total Instructional Hours : 36 Instructional Hours/Week : 2 Credits :1

Course Outcomes(CO):

Upon successful completion of this course, students should be able to:

PMC2128H.01	Analyze the components of IoT products and services develop skills and experiences required to design a novel system using IoT. (Target 50, Modules : M1)
PMC2128H.02	Development and use of emerging Sensors for IoT Technology (Target 50, Modules : M2)

Module 1: Introduction to IoT (18 Hours)

What is IoT Impact of IoT, IoT Challenges. Characteristics of IoT Physical Design of IoT. Logical Design of IoT. IoT Protocols IoT Levels & Deployment Templates.

Module 2: IoT Network Architecture & "Things" in IoT: (18 Hours) M2M, Differences and Similarities between M2M and IoT Core functional stack, Data management stack Sensors, Actuators, Smart objects, Basics of Sensor Networks..

Book of Study :

1. "IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things", by David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton, Jerome Henry; 1st Edition, 2018, Pearson India Pvt. Ltd.
2. "Internet of Things: A Hands-on Approach", by Arshdeep Bahga and Vijay Madisetti, 1st Edition, 2015, Universities Press (India) Pvt. Ltd.
3. 21 Internet of Things (IoT) Experiments: Learn IoT, the programmer's way", by

Yashavant Kanetkar and Shrirang Korde, 1st Edition, 2018, BPB Publications.
4. http://www.hands-on-books-series.com/iot.html

Scheme of Evaluation :

1. The Assessment will be either written or administered through an electronic device/means. Three continuous assessments will be conducted for the assessment.

Sl. No	Components of CAE	Marks
1	Continuous Assessment Examination Assessment (MCQ)	10 marks
2	Assessment (Written Exam)	20 Marks
3	Case Study: IoT Application case study on the project domain (Report + Viva)	20 marks
	Total	**50 marks**

PMC2129 - DOMAIN EXPERTISE WORKSHOP III

Total Instructional Hours : 72 Instructional Hours/Week : 4 Credits: 0

Course Outcomes(CO):

Upon successful completion of this course, students should be able to:

	1 Build expertise in a particular domain like tourism, hospital etc (Target 60)
	2 Interact with clients in their location (Target 60)
	3 Gather and document requirements in a professional manner (Target 60)

Scheme of Evaluation :

1. **Guidelines**

• There shall be a workshop conducted from the first semester onwards • Specialists and experts from different domains will be the resource persons, who may share their own domain knowledge with students

• Domains can be Health Care, ERP, Retail, IT Infrastructure, Banking, Financial Services and Insurance (BFSI), etc

• Duration of the workshop shall be minimum one day

• Students should attend the workshop and prepare a report on the same, which includes the definition of the domain, recent developments, and respective careers, not exceeding 15 pages

• An examination of one-hour duration will be conducted based on the workshop • A student should acquire a minimum of 50% of marks to pass the examination

Schedule

- The workshop will be conducted in the second month after the commencement of the semester
- Students have to submit the report within 5 days after the workshop • The examination will be conducted within a week after the report submission

Evaluation Criteria

- Preparation of the report
  - Format
  - Organization
  - Completeness
- Examination

Distribution of Marks

Sl No:	Component	Marks
1	Report	20
2	Examination	30
	Total	50

PMC2130 - MAIN PROJECT

Total Instructional Hours : 360 Instructional Hours/Week : 20 Credits :12

Course Outcomes(CO):

Upon successful completion of this course, students should be able to:

	Gather and document (SRS) the requirement of use case (Target 40)
	Model the application using UML (Target 40)
	Design the data store layout (Target 40)
	Implement solution using suitable tools and technologies (Target 40)
	Validate and verify the solution (Target 40)

Practical work :

1. **Guidelines for the project**

   The project work is not only a partial fulfilment of the MCA requirements, but also a mechanism to demonstrate your skills, abilities and specialization. The project work can be done in any one of the four competent areas. The different competent areas are programming, data science, networking and entrepreneurship. Project should include submission of abstract and requirement analysis, system design, coding and execution of the project. It includes three reviews and the total mark for the reviews is 100. The guidelines for the same will be given within seven days after the

commencement of the sixth semester

Entrepreneurship

A committee of five members, Director, Head of the Department, faculty adviser and two external experts will review the business plan submitted by the candidate during the first month of the fifth semester. The candidate can choose entrepreneurship as the main project if and only if the committee approves the business plan. Otherwise he/she has to do the project in any other streams. If rejected, the candidate has to submit the abstract of the new project within two weeks after rejecting the business plan. The abstract will be approved by the department council within two months after the commencement of the fifth semester

Scheme of Evaluation :

1. **Final Evaluation of the project:** The final evaluation of the project will be at the end of the sixth semester. It includes project presentation, execution and viva. The total marks for the final evaluation is 200. The guidelines for the final evaluation will be announced within seven days after the commencement of the sixth semester. The assessment criteria should also include the following if the student had opted internship

Sl No	Components for Assessment of Internship	Marks
1	Report	40 Marks
2	Presentation	60 Marks
	Total	**100 Marks**

Components of CA		
Review – I (Topic Selection, Abstract, SAS)	:	35 Marks
Review – II (50% Completion)	:	40 Marks
Review – III (Final Execution & Presentation)	:	50 Marks
Report	:	25 Marks
Total		150 Marks
Components of SEE		
Presentation	:	75 Marks
Execution	:	75 Marks
Viva	:	50 Marks
Total		200 Marks

PMC2131 - VIVA VOCE

Total Instructional Hours : 36 Instructional Hours/Week : 2 Credits :2

Course Outcomes (CO):

Upon successful completion of this course, students should be able to:

PMC 2131.01	Assess themselves regarding knowledge gained during programme (Target 60)
PMC2131.02	Face a prospective technical interview (Target 100)

Practical work :

1. **Guidelines for the Viva Voce**

   A panel of faculty members appointed by the Department Council will conduct the viva. Questions for the viva will be from the stream opted by the student (30%), recent trends in computer science (20%) and from the courses of the final year (30%) and previous semesters (20%).

   The viva will be conducted along with the final evaluation of the main project.