E.G.S. PILLAY ENGINEERING COLLEGE, (Autonomous)

Approved by AICTE, New Delhi

Affiliated to Anna University, Chennai | Accredited by NAAC with 'A++ 'Grade

Accredited by NBA (B.Tech - IT, B.E-CSE and ECE)(Tier-1)

NAGAPATTINAM – 611002

B.Tech – Computer Science and Business Systems

R-2019

VII SEMESTER

Code No.	Course Name	L	T	P	C	Hours/Week	Maximum Marks			Category
							CA	ES	Total	
	Theory Course									
1902BS701	Usability Design of Software Applications	2	0	2	3	4	50	50	100	PC
1902BS702	Services Science and Service Operational Management	3	0	0	3	3	40	60	100	PC
1902BS703	IT Project Management	3	0	0	3	3	40	60	100	PC
1902BS703	Human Resource Management	3	0	0	3	3	40	60	100	PC
	Professional Elective III	3	0	0	3	3	40	60	100	PE
	Professional Elective IV	3	0	0	3	3	40	60	100	PE
	Laboratory Course									
1902BS751	Technical Mini Project	0	0	2	1	2	50	50	100	EEC
	Total	**17**	**0**	**8**	**19**	**23**	**310**	**390**	**700**	

LIST OF ELECTIVES

PROFESSIONAL ELECTIVE COURSES										
Code No.	**Course Name**	**L**	**T**	**P**	**C**	**Hours / Week**	**Maximum Marks**			**Category**
							CA	**ES**	**Total**	
PE-3 [7th Semester]										
1903BS009	Data Mining and Analytics	3	0	0	3	3	40	60	100	PE
1903BS023	Business Intelligence	3	0	0	3	3	40	60	100	PE
1903BS024	Financial Analytics	3	0	0	3	3	40	60	100	PE
1903BS004	Conversational Systems	3	0	0	3	3	40	60	100	PE
PE-4 [7th Semester]										
1903BS013	Image Processing and Pattern Recognition	3	0	0	3	3	40	60	100	PE
1903BS014	Behavioral Economics	3	0	0	3	3	40	60	100	PE
1903BS025	Social Information Networks	3	0	0	3	3	40	60	100	PE
1903BS012	Mobile Computing	3	0	0	3	3	40	60	100	PE

1902BS701	USABILITY DESIGN OF SOFTWARE APPLICATIONS	L	T	P	C
		2	0	2	3

PREREQUISITE: Nil

COURSE OBJECTIVES:

1. To Learn the fundamentals of user cantered design, their relevance and contribution to business.
2. I to study the principles of heuristic evaluation for interactive design
3. I to familiarize the facets of user Experience(UX) Design, Particularly as applied to the digital artifacts.
4. I to implement complex mobile/web applications.

Module I	**INTRODUCTION TO USER CENTRED DESIGN**	**6 Hours**

Basics of User Centred design –Elements-Models and approaches –User Centred Design Principles – Usability-UCD Process-Analysis tools: Personas, Scenarios and essential use cases with examples – User –Centred Design and Agile aspects of User Centred design.

Module II	**INTERACTIVE DESIGN EVALUATION**	**6 Hours**

Introduction to interactive Design Process-Interactive design in practice-Introducing evaluation – Evaluation: Inspection, Analysis and models-Inspection: Heuristic Evaluation :10 Heuristic Principles ,Examples-Case study, A heuristic Evaluation of Iraq E-Portal.

Module III	**DEVELOPMENT OF APPLICATION**	**6 Hours**

Case study: Development of any application like mobile or web based on user centred Design –design lifecycle: Establishing Requirements, Design, Prototyping and Construction.

Module IV	**UX RESEARCH**	**6 Hours**

Understanding users, their goals, context of use and environment of use, Research Techniques: Contextual Enquiry, User interviews, Competitive Analysis for UX.

Module V	**INTERACTIVE PRODUCT DEVELOPMENT**	**6 Hours**

The problem with complexity-iterative product development –Scenarios and Persona Technique, Design thinking Technique: Discovery and brainstorming –Concept Development –Prototyping Techniques, paper, Electronic, Prototyping Tools-Review and Feedback

	TOTAL: 30 HOURS

Mode of Assessment: Activity/CAT/Assignment/seminar/ESE

Course Outcomes:
1. Define the fundamentals of User Centered Design and User Experience their relevance and contribution to businesses
2. Familiarize them to the facets of User Experience (UX) Design, particularly as applied to the digital artifacts
3. Analyze the Design Thinking Technique for the design and development lifecycle
4. Evaluate user research and solution conceptualization and validation as interwoven activities in the design and development lifecycle
5. Construct various UX research techniques for a better UI experience

FURTHER READING:

1. Interaction Design: Beyond Human-Computer Interaction, 4th Edition, Jenny Preece, Helen Sharp and Yvonne Rogers
2. Observing the User Experience, Second Edition: A Practitioner's Guide to User Research. Elizabeth Goodman, Mike Kuniavsky, Andrea Moed

REFERENCES:
Web References:
1 https://usabilitygeek.com/user-centered-design-introduction/
2 https://www.invisionapp.com/inside-design/user-centered-design-definition-examples-and-tips
3 https://uxplanet.org/usability-first-why-usability-design-matters-to-ui-ux-designers-9dfb5580116a

LIST OF EXPERIMENTS [SUGGESSTED]
1. Product Appreciation Assignment – Evaluating the product from User Centred Design aspects such as functionality, ease of use, ergonomics, and aesthetics. 2. Heuristic Evaluation: Group Assignment initiation (Website and App) Evaluation for key tasks of the app or website for heuristic principles, severity, recommendations. 3. Students will identify a project in the given domain (Healthcare, E Commerce, Online Learning Platforms, Gaming, Point-of-Sale, Smart Things) and its related website or mobile app to redesign. They will take this redesign project through the design lifecycle: Discovery Define Design Implement (Design Prototype) Usability Testing The below design methods and techniques will be imparted w.r.t. the group project selected by the students 4. Presentation of Persona for the group project 5. Task flow detailing for the project 6. Project Prototyping Iteration 1 &. Final Product Demo(Mobile or Web Application)

1902BS702	SERVICES SCIENCE AND SERVICE OPERATIONS MANAGEMENT	L	T	P	C
		3	0	0	3

PREREQUISITE: NIL

COURSE OBJECTIVES:

1. To understand the concepts about services and distinguish it from goods.
2. To identify characteristics and nature of services.
3. To comprehend ways to design services and evaluate them using service qualities.
4. To understand how various methods can be used to operate and manage Service businesses.
5. To understand how innovation can be approached from Services point of view.

Module I	Introduction	15 Hours

Introduction: Introduction to the course, Introduction to service operations, Role of service in economy and society, Introduction to Indian service sector. Nature of Services and Service Encounters: Differences between services and operations, Service package, characteristics, various frameworks to design service operation system, Kind of service encounter, importance of encounters. Service-Dominant Logic: From Goods-Dominant logic to Service-Dominant logic, Value Co-creation

Module II	Service Strategy and Competitiveness	15 Hours

.Service Strategy and Competitiveness: Development of Strategic Service Vision (SSV), Data Envelopment Analysis. New Service Development: NSD cycle, Service Blueprinting, Elements of service delivery system. Service Design: Customer Journey and Service Design, Design Thinking methods to aid Service Design. Locating facilities and designing their layout: models of facility locations (Huff's retail model), Role of service-scape in layout design. Service Quality: SERVQUAL, Walk through Audit, Dimensions of Service quality & other quality tools. Service Guarantee & Service Recovery: How to provide Service guarantee? How to recover from Service failure?

Module III	Forecasting Demand for Services	15 Hours

Forecasting Demand for Services: A review of different types of forecasting methods for demand forecasting. Managing Capacity and Demand: Strategies for matching capacity and demand, Psychology of waiting, Application of various tools used in managing waiting line in services. Managing Facilitating Goods: Review of inventory models, Role of inventory in services. Managing service supply relationship: Understanding the supply chain/hub of service, Strategies for managing suppliers of service. Vehicle Routing Problem: Managing after sales service, Understanding services that involve transportation of people and vehicle, Techniques for optimizing vehicle routes. Service Innovation: Services Productivity, Need for Services Innovation.

	TOTAL: 45 HOURS

Mode of Assessment:PAT/ESE/Presentation/…

Course Outcomes:

1.Understand the concepts about services and distinguish it from goods

2. Identify characteristics and nature of services

3. Analyze the ways to design services and evaluate them using service qualities

4. Analyze the various methods can be used to operate and manage Service businesses

5. Understand how innovation can be approached from Services point of view

FURTHER READING:

1. Fitzsimmons & Fitzsimmons, Service Management: Operations, Strategy, Information Technology, McGraw Hill publications (7th edition)

REFERENCES:	
1.	Wilson, A., Zeithaml, V. A., Bitner, M. J., & Gremler, D. D. (2012). Services marketing: Integrating customer focus across the firm. McGraw Hill.
2.	Lovelock, C. (2011). Services Marketing, 7/e. Pearson Education India
3.	Reason, Ben, and Lovlie, Lavrans, (2016) Service Design for Business: A Practical Guide to Optimizing the Customer Experience, Pan Macmillan India,
4.	Chesbrough, H. (2010). Open services innovation: Rethinking your business to grow and compete in a new era. John Wiley & Sons.
5.	https://nptel.ac.in/courses/110/106/110106046/
6.	https://www.edx.org/learn/operations-management
7.	https://www.coursera.org/courses?query=operations%20management

1902BS703	IT PROJECT MANAGEMENT	L	T	P	C
		3	0	0	3

PREREQUISITE: NIL

COURSE OBJECTIVES:

1. To learn the techniques for effective planning, managing, executing and control projects within time and cost targets with a focus on Information Technology and Service sector
2. To learn agile project management techniques such as Scrum and DevOps

Module I	**PROJECT OVERVIEW AND PROJECT SCHEDULING**	**9 Hours**

Project Overview and Feasibility Studies: Identification, Market and Demand Analysis, Project Cost Estimate, Financial Appraisal-Project Scheduling, Introduction to PERT and CPM, Critical Path Calculation, Precedence Relationship, Difference between PERT and CPM

Module II	**COST CONTROL, SCHEDULING AND MANAGEMENT FEATURES**	**9 Hours**

Cost Control and Scheduling: Project Cost Control (PERT/Cost), Resource Scheduling & Resource Leveling – Risk Analysis, Project Control, Project Audit- Project termination review

Module III	**AGILE PROJECT MANAGEMENT**	**9 Hours**

Agile Project Management: Introduction, Agile Principles, Agile process-Relationship between agile scrum lean Devops and IT service management (ITIL) -Agile Team

Module IV	**SCRUM**	**9 Hours**

Scrum: Scrum frame work-scrum values-scrum rooms-scrum events-scrum artifact-efficient and quality

Module V	**DEVOPS**	**9 Hours**

Devops: Overview and its Components, phase of devops, identify the teams-creating a value stream map-devops transformation team -organizational archetypes-developing the right habits and capabilities -integrating into the daily work of devops-proactive integration of the devops
case study.

	TOTAL: 45 HOURS

Mode of Assessment: PAT/ESE/Presentation/…

Course Outcomes:

1.Understand about project overview and scheduling

2.Apply the concept of Project scheduling and control projects within time and cost targets

3.Analyze the project management features and perform agile project management

4.Understand various technologies used in Scrum

5. Analyze and learn about the agile project management technique DevOps.

FURTHER READING:

1. Notes to be distributed by the course instructor on various topics
2. Mike Cohn, Succeeding with Agile: Software Development Using Scrum

REFERENCES:	
1.Mike Cohn, "Succeeding with Agile: Software Development Using Scrum", Addison-Wesley Professional Publisher, 1st Edition, 2009.	
2.Roman Pichler, "Agile Product Management with Scrum", Addison-Wesley publisher, 1st Edition, 2010.	
3.Ken Schwaber, "Agile Project Management with Scrum (Microsoft Professional)", Microsoft Press US publisher, 1st Edition, 2004.	
4.Gido and Clements, Successful Project Management, Second Edition, Thomson Learning, 2003	
5.Harvey Maylor, Project Management, Third Edition, Pearson Education, 2006	
6.Clifford Gray and Erik Larson, Project Management, Tata McGraw Hill Edition, 2005.	
7.John M. Nicholas, Project Management for Business and Technology - Principles and Practice, Second Edition, Pearson Education, 2006	
8.Hughes B, Project Management for IT-related Projects. BCS Publications, 2012	
9.https://www.edx.org/learn/project-managemen	
10. https://nptel.ac.in/courses/110/104/110104073/	
11.https://nptel.ac.in/courses/106/105/106105218/	

1902BS704	HUMAN RESOURCE MANAGEMENT	L	T	P	C
		3	0	0	3

PREREQUISITE: NIL

COURSE OBJECTIVES:

Facilitate student to imbibe knowledge about understanding the basic concepts and importance of Human Resources Management, Recruitment, Training, Communications, Employee Empowerment, Employee Interaction, Various Human Resources Applications and Practices, Managerial functions etc.

Module I	**HUMAN RESOURCES MANAGEMENT**	09 Hours

Human Resources Management - Human Resource Policy, Procedures and Practices.

Module II	**HUMAN RESOURCE PLANNING**	9 Hours

Human Resource Planning – Human Resource Demand, Forecasting and Supply – Human Resource Retention and Strategy – Performance Appraisal – Benefits, Methods.

Module III	**HUMAN RESOURCE FUNCTIONS**	9 Hours

Human Resource Functions – Recruitment and Staffing, Training – Types Of Training, Compensation, Promotion – Types Of Promotion – Job Security in Software Division – Employees Relations – Human Resource Information Systems and Payroll.

Module IV	**QUALITY OF WORK LIFE**	9 Hours

Quality of Work Life – Need and Importance Workplace Environment – Stress Management, IQ vs EQ, Cross Culture and Adoptability in MNC's Environment

Module V	**STRATEGIC HUMAN RESOURCE MANAGEMENT**	9 Hours

Strategic Management of Human Resources – SHRM , Relationship Between HR and Corporate Strategy, Strategies for Managing Careers – Competency Mapping – Need – Classification – Competency Need For Recruitments and retention of Talent Acquisitions.

	TOTAL: 45 HOURS

Course Outcomes:

1: Understand the basic principles of Human Resource Management.

2: Understand with the system design of Human Resource Management.

3: Describe the concepts, roles, functional areas and activities of HR.

4: Express the organization's employee, their interest, motivation, satisfaction belief of fair treatment.

5: Apply the actual impact on the firm's current performance and sustain ability in the long run.

TEXT BOOKS:

1.Prof. Gary Dessler , Human Resources Management, Pearson, 16th Edition,2020.

2.Prof.John M.Ivancevich, "Human Resource Management", Tata McGraw HillPublication, 12th Edition, 2003.

3.Prof.Aswathappa, "Human Resource Management and Personnel Management", 3 rd Edition, Tata McGraw Hill, 2002

REFERENCE BOOKS:

Dr.C.B.Gupta, "Human Resource Management ", Sultan Chand & Sons, New Delhi, 1st Edition, 2018.

Prof.S.S.Khanka, "Human Resource Management", Chand & Company, New Delhi, 2019.

Dr.S.Seetharaman et al., "Human Resource Management", SciTech Publications Pvt Ltd. Chennai,2012

1903BS023	BUSINESS INTELLIGENCE	L	T	P	C
		3	0	0	3

PREREQUISITE: Basic understanding of computer technology

COURSE OBJECTIVES:

1. Introduce the concepts and components of Business Intelligence (BI).
2. Evaluate the technologies that make up BI Data warehousing, OLAP.
3. Identify the technological architecture that makes up BI systems.
4. Plan the implementation of BI system.
5. To learn Power BI and looker tools.

Module I	Understanding Business Intelligence	10 Hours

The challenges of decision making, what is business intelligence?, The business intelligence value proposition, The combination of business and technology.

Module II	Business Intelligence Technology Counterparts	10 Hours

Data warehousing, Enterprise resource planning, customer relationship management, Business intelligence and financial information.

Module III	Business Intelligence user Interface	10 Hours

Querying and reporting, Reporting and querying toolkits, Basic Approaches, Data Access, Dashboards.

Module IV	On-line Analytical processing	10 Hours

OLAP applications and functionality, multi-dimensions, OLAP Architecture, Visualization, Guided analysis, Handling unstructured data, Bottom line.

Module V	BI Case Study	5 Hours

Using Power BI or Looker: Get started with data analytics, Prepare data for analysis, Model data, Visualize data, Data analysis, Manage workspaces and datasets.

TOTAL: 45 HOURS

Mode of Assessment: CAT/Assignment/Quiz/Seminar/Presentation/ESE

Course outcomes:

1. Discuss the impact of Business Intelligence (BI) theories, architectures and methodologies on theorganizational decision making process.
2. Analyze the differences between the structured, semi-structured and unstructured data types to leverage thebest technologies.
3. Conduct enterprise –wide data requirements analysis to create a BI solution.
4. Use OLAP tools to import data into multi-dimensional data cubes.
5. Understand Power BI and Looker technologies used in Business Intelligence.

REFERENCES:

1. Carlo Vercellis (2011). "Business Intelligence: Data Mining and Optimization for Decision Making". John Wiley & Sons.

2. David Loshin (2012). "Business Intelligence: The Savvy Manager's Guide". Newnes.

3. Elizabeth Vitt, Michael Luckevich, Stacia Misner (2010). "Business Intelligence". O'Reilly Media, Inc.

4. Rajiv Sabhrwal, Irma Becerra-Fernandez (2010). "Business Intelligence". John Wiley & Sons

5. Swain Scheps (2013). "Business Intelligence for Dummies". Wiley.

6.https://learn.microsoft.com/en-us/training/paths/prepare-to-teach-pl-300-microsoft-power-bi-data-analyst/

7.https://learn.microsoft.com/en-us/training/powerplatform/power-bi

1903BS014	BEHAVIOURAL ECONOMICS	L	T	P	C
		3	0	0	3

PREREQUISITE: Nil

COURSE OBJECTIVES:

1. To impart knowledge on current ideas and concepts regarding decision making in Economics, Particularly from a behavioral science perspective.
2. The course will explore key departures and the consequences of behavior of firms, households and other economics entities.
3. To provide an overview of how behavioral principles have been applied to economic problems.

Module I	**Introduction & Basics of Choice Theory**	**10 Hours**

The neoclassical/standard model and behavioral economics in contrast; historical background; behavioral economics and other social sciences; theory and evidence in the social sciences and in behavioral economics; applications – gains and losses, money illusion, charitable donation, Revisiting the neoclassical model; utility in economics and psychology; models of rationality; connections with evolutionary biology and cognitive neuroscience; policy analysis – consumption and addiction, environmental protection, retail therapy; applications – pricing, valuation, public goods, choice anomalies.

Module II	**Beliefs, Heuristics and Biases**	**9 Hours**

Revisiting rationality; causal aspects of irrationality; different kinds of biases and beliefs; self-evaluation and self-projection; inconsistent and biased beliefs; probability estimation; trading applications – trade in counterfeit goods, financial trading behavior, trade in memorabilia.

Module III	**Choice under Uncertainty**	**8 Hours**

Background and expected utility theory; prospect theory and other theories; reference points; loss aversion; marginal utility; decision and probability weighting; applications – ownership and trade, income and consumption, performance in sports.

Module IV	**Intertemporal Choice**	**8 Hours**

Geometric discounting; preferences over time; anomalies of inter-temporal decisions; hyperbolic discounting; instantaneous utility; alternative concepts – future projection, mental accounts, heterogeneous selves, procedural choice; policy analysis – mobile calls, credit cards, organization of government; applications – consumption and savings, clubs and membership, consumption planning.

Module V	**Game and Strategy Behavior & Social Preference**	**10 Hours**

Review of game theory and Nash equilibrium – strategies, information, equilibrium in pure and mixed strategies, iterated games, bargaining, signaling, learning; applications – competitive sports, bargaining and negotiation, monopoly and market entry. Individual preferences; choice anomalies and inconsistencies; social preferences; altruism; fairness; reciprocity; trust; learning; communication; intention; demographic and cultural aspects; social norms; compliance and punishment; inequity aversion; policy analysis – norms and markets, labor markets, market clearing, public goods; applications – logic and knowledge, voluntary contribution, compensation design.

	TOTAL: 45 HOURS

Mode of Assessment:CAT/Assignment/Quiz/Seminar/Presentation/ESE

Course Outcomes

1. Identify and evaluate evidence for systematic departures of economic behavior from the Predictions of the neoclassical model, and psychological explanations for these anomalies.
2. Incorporate psychologically motivated assumptions into economic models and interpret the implications of these assumptions.
3. Explain how these models change the predictions for equilibrium behavior and welfare analysis and assess the implications for optimal policy.
4. Compare the predictions of neoclassical and behavioral models and evaluate the best method for approaching a given topic.
5. Apply Behavioral principles in economic problems.

REFERENCES:	
1.N. Wilkinson and M. Klaes, "An Introduction to Behavioral Economics", 2017, 3rd Edition, Red Globe Press.	
2.Bazerman, Max and Don Moore. Judgment in Managerial Decision Making, 2012. 8th Edition, John Wiley & Sons.	
3.Kahneman, Daniel.Thinking, Fast and Slow, 2011, New York: Farrar, Straus and Giroux	