

COMSATS Institute of Information Technology
Registrar Office, Principal Seat, Islamabad

No: CIIT-Reg/Notif-727/12/1052

July 04, 2012

NOTIFICATION

Scheme of Studies of Doctor of Philosophy (PhD) in Computer Engineering

It is hereby notified that the Academic Council in its 13th Meeting held on June 04, 2012 approved the following scheme of studies for Doctor of Philosophy (PhD) in Computer Engineering with effect from Fall 2012 at CIIT system:

	Minimum No of Courses	Minimum No of Credit Hours
1. PhD Course Work (List Attached)	06	18
2. PhD Thesis		09

Note:

All Rules and Regulations approved by BASAR from time to time shall be applicable

This issues with the approval of the Competent Authority.


Nadeem Uddin Qureshi
Additional Registrar

Encl: (Pages 11 in total Including this page)

Distribution:

1. Dean, Faculty of Engineering, CIIT
2. Dean of Research, Innovation and Commercialization (DORIC), CIIT
3. All Directors, CIIT System.
4. Incharge, CIIT Islamabad Campus.
5. Chairman, Department of Electrical Engineering, CIIT
6. All Incharges, Academic Sections, CIIT Campuses
7. All HoD's/Incharges, Department of Electrical Engineering, CIIT Campuses
8. Controller of Examinations, CIIT.
9. All Incharges, Examination Departments, CIIT Campuses.

CC:

1. PS to Rector
2. PA to Registrar

List of Graduate Courses

Sr.	Course Code	Course Title	Credits Hours
1	ECE600	Engineering Mathematics	3(3, 0)
2	ECE601	Stochastic Processes	3(3, 0)
3	ECE602	Discrete Mathematics	3(3, 0)
4	ECE603	Graph Theory	3(3, 0)
5	ECE604	Engineering Optimization	3(3, 0)
6	ECE605	Probabilistic Learning: Theory and Algorithms	3(3, 0)
7	ECE606	Modeling and Simulation	3(3, 0)
8	ECE607	Research Methods	3(3, 0)
9	ECE608	Project Management	3(3, 0)
10	ECE609	Optimization Techniques	3(3, 0)
11	ECE616	RF System Engineering and Design	3(3, 0)
12	ECE617	Communications System Engineering	3(3, 0)
13	ECE618	Digital Communications	3(3, 0)
14	ECE619	Information Theory and Coding	3(3, 0)
15	ECE620	Communication Signal Processing	3(3, 0)
16	ECE716	Wireless Communication Techniques	3(3, 0)
17	ECE717	Communication Networks-Architectures and Protocols	3(3, 0)
18	ECE718	Mobile Communication Systems	3(3, 0)
19	ECE719	Advanced Digital Communications	3(3, 0)
20	ECE720	Wireless Channel Modeling	3(3, 0)
21	ECE721	Broadband Network Architectures	3(3, 0)
22	ECE722	Modeling and Analysis of Telecommunication Networks	3(3, 0)
23	ECE816	Special Topics in Communication Systems	3(3, 0)

24	ECE817	Advanced Topics in Communications Theory	3(3, 0)
25	ECE818	Advanced Wireless Communications	3(3, 0)
26	ECE819	Advanced Error Control Coding	3(3, 0)
27	ECE820	Advanced Topics in Wireless Networks	3(3, 0)
28	ECE631	Advanced Microprocessor Systems	
29	ECE632	Operating Systems Fundamentals	
30	ECE633	Advanced Computer Architecture	3(3, 0)
31	ECE634	ASIC and FPGA Design	3(3, 0)
32	ECE635	VLSI System Design	3(3, 0)
33	ECE731	Computer-Aided Design of Digital Systems I	3(3, 0)
34	ECE732	Multithreaded Architectures	3(3, 0)
35	ECE733	Real Time Computer Systems	3(3, 0)
36	ECE734	Embedded Computing Systems	3(3, 0)
37	ECE735	Design of Systems on a Chip (SoC)	3(3, 0)
38	ECE831	Computer-Aided Design of Digital Systems II	3(3, 0)
39	ECE832	Advanced Topics in Digital Design	3(3, 0)
40	ECE833	Advanced Microprocessor/Microcontroller Systems	3(3, 0)
41	ECE834	Advanced Topics in Embedded System Design	3(3, 0)
42	ECE835	Advanced Topics in Real-Time Embedded System Design	3(3, 0)
43	ECE646	Advanced Digital Signal Processing	3(3, 0)
44	ECE647	Digital Image Processing	3(3, 0)
45	ECE648	Digital Filters	3(3, 0)
46	ECE649	Image, Video and Multimedia	3(3, 0)
47	ECE650	Fundamentals of Computer Graphics	3(3, 0)
48	ECE651	Pattern Recognition	3(3, 0)
49	ECE746	Audio Signal Processing	3(3, 0)

50	ECE747	Computer Vision	3(3, 0)
51	ECE748	Advanced Pattern Recognition	3(3, 0)
52	ECE749	Advanced Filter Design	3(3, 0)
53	ECE846	Digital Watermarking	3(3, 0)
54	ECE847	Advanced Topics in Image Processing	3(3, 0)
55	ECE848	Advanced Topics in Computer Vision	3(3, 0)
56	ECE849	Advanced Topics in Pattern Recognition	3(3, 0)
57	ECE661	Robotics	3(3, 0)
58	ECE662	Neural and Fuzzy Systems	3(3, 0)
59	ECE663	Artificial Intelligence	3(3, 0)
60	ECE664	Automata Theory	3(3, 0)
61	ECE761	Machine Learning	3(3, 0)
62	ECE762	Intelligent Control Systems	3(3, 0)
63	ECE763	Intelligent Systems	3(3, 0)
64	ECE861	Advanced Topics in AI and Neural Computing	3(3, 0)
65	ECE862	Advanced Topics in Knowledge Based Systems	3(3, 0)
66	ECE863	Advanced Topics in Decision Support Systems	3(3, 0)
67	ECE864	Advanced Topics in Machine Learning	3(3, 0)
68	ECE673	Data Networks and Communications	3(3, 0)
69	ECE675	Internetworking: Architectures, Protocols and Applications	3(3, 0)
70	ECE676	Interconnection Networks	3(3, 0)
71	ECE677	Wireless Networks	3(3, 0)
72	ECE678	Wireless LANs	3(3, 0)
73	ECE688	Mobile and Broadband Networks	3(3, 0)
74	ECE689	Mobile Applications and Services	3(3, 0)
75	ECE760	IP Routing Protocols and Internetwork Design	3(3, 0)

76	ECE772	Networks and Computer Security	3(3, 0)
77	ECE775	Design and Analysis of Computer Communication Networks	3(3, 0)
78	ECE786	Multimedia Networking	3(3, 0)
79	ECE776	Wireless Wide Area Networks (WWANs)	3(3, 0)
80	ECE777	Advanced Wireless Communications	3(3, 0)
81	ECE778	Performance Evaluation of Computer Networks	3(3, 0)
82	ECE779	Emerging Wireless Networks	3(3, 0)
83	ECE780	QoS Architectures for Multimedia Wireless Networks	3(3, 0)
84	ECE781	Wireless Medium Access Techniques	3(3, 0)
85	ECE876	Advanced Topics in Wireless Communications	3(3, 0)
86	ECE877	Advanced Topics in Information Theory and Coding	3(3, 0)
87	ECE878	Advanced Topics in Wireless Networks	3(3, 0)
88	ECE879	Selected Topics in Wireless Networks Design and Planning	3(3, 0)
89	ECE880	Advanced Mobile Applications	3(3, 0)
90	ECE691	Software Development Methodologies	3(3, 0)
91	ECE692	Distributed Databases	3(3, 0)
92	ECE693	Data Structures for Computer Graphics	3(3, 0)
93	ECE791	Compiler Design	3(3, 0)
94	ECE792	Data Mining	3(3, 0)
95	ECE793	Object Oriented Software Engineering	3(3, 0)
96	ECE794	3-D and Virtual Imaging	3(3, 0)
97	ECE795	Multimedia Data Compression	3(3, 0)
98	ECE796	Advanced Computer Graphics	3(3, 0)
99	ECE891	Advanced Topics in Operating Systems	3(3, 0)
100	ECE892	Advanced Computer Animation	3(3, 0)
101	ECE680	Digital Control Systems	3(3, 0)

102	ECE681	Optimization Control Theory	3(3, 0)
103	ECE682	Industrial Automation and Control	3(3, 0)
104	ECE694	Linear Systems Theory	3(3, 0)
105	ECE753	Non-Linear Systems and Control	3(3, 0)
106	ECE764	Advanced Linear Systems	3(3, 0)
107	ECE765	Multivariable Control	3(3, 0)
108	ECE766	Adaptive Control	3(3, 0)
109	ECE767	Robust Control	3(3, 0)
110	ECE802	Advanced Topics in Control Systems	3(3, 0)
111	ECE611	Electromagnetic Field Theory	3(3, 0)
112	ECE612	Microwave Passive Devices and Circuits	3(3, 0)
113	ECE613	Microwave Active Devices and Circuits	3(3, 0)
114	ECE614	Introduction to RF Front-End Design	3(3, 0)
115	ECE615	RF System Engineering and Design	3(3, 0)
116	ECE621	Digital Design	3(3, 0)
117	ECE622	Logic Design and Switching Theory	3(3, 0)
118	ECE626	RF Filter Design	3(3, 0)
119	ECE627	Radio Engineering	3(3, 0)
120	ECE628	Antennas Theory, Design and Applications	3(3, 0)
121	ECE629	Radio Wave Propagation	3(3, 0)
122	ECE630	RF Propagation and Planning for Wireless Communications	3(3, 0)
123	ECE636	DSP Hardware Systems Design	3(3, 0)
124	ECE637	DSP Software Systems Design	3(3, 0)
125	ECE638	Microprocessor/Microcontroller Based Systems	3(3, 0)
126	ECE641	Radar Systems	3(3, 0)

127	ECE642	Satellite Communications	3(3, 0)
128	ECE644	Communication Signal Processing	3(3, 0)
129	ECE645	Communication Electronics Design	3(3, 0)
130	ECE652	Mobile Devices Programming	3(3, 0)
131	ECE653	Web Technologies	3(3, 0)
132	ECE656	Embedded System Design for Telecommunications	3(3, 0)
133	ECE657	Digital Telephony	3(3, 0)
134	ECE658	Telecommunication Switching Systems	3(3, 0)
135	ECE659	Performance Analysis of Communication Systems	3(3, 0)
136	ECE660	Telecommunication Network Management	3(3, 0)
137	ECE665	Advanced Programming Techniques	3(3, 0)
138	ECE666	Object Oriented Databases	3(3, 0)
139	ECE667	Web Based Databases	3(3, 0)
140	ECE668	Multimedia Indexing and Retrieval	3(3, 0)
141	ECE671	Optical Fiber Networks	3(3, 0)
142	ECE672	Communication System Design	3(3, 0)
143	ECE674	Graph Theory and Network Optimization	3(3, 0)
144	ECE679	Multimedia Technologies	3(3, 0)
145	ECE686	Design of Computer Communication Networks	3(3, 0)
146	ECE687	Mobile Cellular Systems and Standards	3(3, 0)
147	ECE690	Mobile Communication Systems	3(3, 0)
148	ECE695	Natural Language Processing	3(3, 0)
149	ECE700	Performance of Computer Systems	3(3, 0)
150	ECE701	Parallel Processing	3(3, 0)
151	ECE702	Diagnosis and Design of Reliable Digital Systems	3(3, 0)

152	ECE703	Probabilistic Methods in Computer Systems Modeling	3(3, 0)
153	ECE704	Analysis of Algorithms	3(3, 0)
154	ECE705	Hardware/Software Co-Design Techniques	3(3, 0)
155	ECE706	Embedded Software and RTOS	3(3, 0)
156	ECE707	Mixed-Signal VLSI Systems Design	3(3, 0)
157	ECE708	VLSI Architectures and Algorithms	3(3, 0)
158	ECE709	Design of Real-Time Embedded Systems	3(3, 0)
159	ECE710	Protocol Software Design and Development	3(3, 0)
160	ECE711	Electromagnetic Interference and Compatibility	3(3, 0)
161	ECE711	Data Warehousing	3(3, 0)
162	ECE712	Numerical and Computational Techniques in Electromagnetics	3(3, 0)
163	ECE712	Requirements Engineering	3(3, 0)
164	ECE713	Microwave Integrated Circuits	3(3, 0)
165	ECE713	Software Project Management	3(3, 0)
166	ECE714	RF and Microwave Measurement Techniques	3(3, 0)
167	ECE714	Software Quality Assurance	3(3, 0)
168	ECE715	Smart Antennas for Mobile Communications	3(3, 0)
169	ECE715	Software Engineering Technologies	3(3, 0)
170	ECE726	Radar Signal Processing	3(3, 0)
171	ECE727	Modern Radar Systems	3(3, 0)
172	ECE728	Adaptive Techniques for Wireless Communications	3(3, 0)
173	ECE729	Channel Estimation and Characterization	3(3, 0)
174	ECE730	Communication Channel Modeling	3(3, 0)
175	ECE736	Geometric Modeling	3(3, 0)
176	ECE737	Computer Animation	3(3, 0)

177	ECE741	Wireless Channel Modeling	3(3, 0)
178	ECE742	Advanced Integrated Circuits for Communication	3(3, 0)
179	ECE743	Teletraffic Engineering	3(3, 0)
180	ECE744	Broadband Network Architectures	3(3, 0)
181	ECE745	Telecommunication Software Design	3(3, 0)
182	ECE750	Estimation of Signals and Systems	3(3, 0)
183	ECE751	Adaptive Signal Processing	3(3, 0)
184	ECE752	Detection and Estimation Theory	3(3, 0)
185	ECE756	Modeling and Analysis of Telecommunication Networks	3(3, 0)
186	ECE757	Transport and Switching Technologies	3(3, 0)
187	ECE758	Short-Range Communication Systems	3(3, 0)
188	ECE759	Mobile Computing	3(3, 0)
189	ECE771	Advanced Network Programming	3(3, 0)
190	ECE773	Cryptography and Secure Communication	3(3, 0)
191	ECE774	IP Telephony	3(3, 0)
192	ECE787	Network Programming Techniques	3(3, 0)
193	ECE788	High-Speed Switched Local Area Networks (LANs)	3(3, 0)
194	ECE789	QoS Architectures for Multimedia Wireless Networks	3(3, 0)
195	ECE790	Mobile Devices Applications Development	3(3, 0)
196	ECE800	Advanced Topics in Filter Design	3(3, 0)
197	ECE801	Advanced Topics in Multimedia Technologies	3(3, 0)
198	ECE811	Mobile Networking	3(3, 0)
199	ECE812	Wireless Wide Area Networks (WWANs)	3(3, 0)
200	ECE813	Wireless Metropolitan Area Networks (WMANs)	3(3, 0)
201	ECE814	Wireless Personal and Body Area Networks (WPANs/WBANs)	3(3, 0)

202	ECE815	Advanced Topics in RF System Design	3(3, 0)
203	ECE826	Advanced Topics in RF/Microwave Engineering	3(3, 0)
204	ECE827	Advanced Topics in Antenna Design	3(3, 0)
205	ECE828	Advanced Topics in Radio Wave Propagation	3(3, 0)
206	ECE829	Advanced Topics in RF Planning and Optimization	3(3, 0)
207	ECE830	Advanced Topics in Communication Signal Processing	3(3, 0)
208	ECE841	Advanced Topics in Information Theory and Coding	3(3, 0)
209	ECE842	Advanced Topics in Information Security	3(3, 0)
210	ECE843	Advanced Topics in Telecommunication Electronics	3(3, 0)
211	ECE844	Network Forensics	3(3, 0)
212	ECE845	Traffic Engineering and QoS in TCP/IP Networks	3(3, 0)
213	ECE856	Special Topics in Computer Networks	3(3, 0)
214	ECE857	Advanced Topics in Network Security	3(3, 0)
215	ECE858	Advanced Network Security	3(3, 0)
216	ECE859	Advanced Internetworking (TCP/IP) Protocols	3(3, 0)
217	ECE860	Advanced Multi-user Systems for Wireless Communications	3(3, 0)
218	ECE871	Selected Topics in Wireless Network Security	3(3, 0)
219	ECE872	Selected Topics in Wireless Networks Design and Planning	3(3, 0)
220	ECE873	Advanced Mobile Applications	3(3, 0)
221	ECE874	Advanced Mobile Networking	3(3, 0)
222	ECE875	Special Topics in Computer Systems Architectures	3(3, 0)
223	ECE886	Special Topics in Digital Design	3(3, 0)
224	ECE887	Advanced Topics in VLSI Design	3(3, 0)
225	ECE888	Security Applications: Watermarking and Biometrics	3(3, 0)
226	ECE889	Data Authentication Techniques	3(3, 0)

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227	ECE890	Special Topics in Signal Processing	3(3, 0)
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Thesis

Course Code	Course Title	Credits Hours
ECE900	Thesis	9

Inclusion