Graduate Certificates

Computer Science Certificate — 12

Prerequisites:
One year of programming or CPTR 502 Foundations of Software Development
Undergraduate course in databases (equivalent to CPTR 319)
Undergraduate course in data structures and algorithms (equivalent to CPTR 318)
Calculus I (equivalent to MATH 191)
Undergraduate course in discrete mathematics (equivalent to MATH 280)
Undergraduate course in operating systems (equivalent to CPTR 365)

Select 4 courses:

Code	Title	Credits
CPTR521	Advanced Database Systems	3
CPTR531	Algorithms	3
CPTR551	Parallel and Distributed Systems	3
CPTR555	Advanced Computer Architecture	3
CPTR571	Software Architecture	3

Cyber Security Certificate — 12

Prerequisites:
One year of programming or CPTR 502 Foundations of Software Development
and CPTR 328 Principles of Networking or equivalent course

Code	Title	Credits
CPTR 534	Advanced Network and Server Administration	3
CPTR 544	Offensive Cybersecurity	3
CPTR 545	Defensive Cybersecurity	3
CPTR 554	Cyber Forensics	3

Data Analytics Certificate — 12

Prerequisites:
Undergraduate statistic course (equivalent to MATH 215) and
one year of programming or CPTR 502 Foundations of Software Development

Code	Title	Credits
CPTR 512	Programming in Data Analytics	3
CPTR 519	Databases and Data Warehouses	3
CPTR 524	Data Mining and Analytics	3
CPTR 528	Data Visualization	3

Web Development Certificate — 12

Prerequisites:
One year of programming or CPTR 502 Foundations of Software Development
and CPTR 328 Principles of Networking or equivalent course

Code	Title	Credits
CPTR 526	User Experience	3
CPTR 546	Web Services	3
CPTR 556	Front-end Web Development	3
CPTR 519	Databases and Data Warehouses	3
CPTR 535	Mobile Application Development	3

OR (CPTR 519 or CPTR 535)