

# ■ Curriculum vs Job Market Alignment Report

## ■ Executive Summary

This curriculum analysis reveals strengths in data-driven areas. Business Intelligence and Visualization (79-81%), Data Science (75-83%), and Advanced Programming (66-75%) demonstrate strong alignment with market needs. However, foundational areas like Computing Fundamentals, Discrete Structures, and multiple animation-related courses show a critical lack of alignment (0% scores), indicating potential disconnects with practical application. Numerous courses score below 20%, highlighting widespread skill gaps in areas like computer organization, HCI, and security. Missing skills cluster around core computing concepts like hardware, formal logic, animation software application, and foundational programming. Low scores in Systems Analysis and Design and Technopreneurship (under 30%) suggest weaknesses in translating technical skills into practical project execution and business context. Curriculum improvements should prioritize strengthening foundational courses, integrating hands-on application for low-scoring subjects, and bolstering practical skills in systems analysis, design, and technopreneurship. Focusing on these areas will better prepare students for industry demands and increase job market competitiveness.

Course Code	Course Title	Skills Taught	Skills in Market	Score	Coverage	Avg. Similarity
GameMath	Applied Math for Games	applying analytical geometry calculating probability implementing vector algebra modeling game behavior performing statistical analysis simulating game scenarios using mathematical equations in game development using mathematical functions in game development using matrices	performing data analysis	9	0.11	0.84
Infom1	Information Management 1	creating er diagrams designing databases designing schemas implementing relational databases modeling data writing sql	designing databases modeling data writing sql queries	48	0.50	0.98

OOPro	Object-Oriented Programming	applying composition applying inheritance defining classes encapsulating data implementing polymorphism using abstraction using java	using java	14	0.14	1.00
SofEng	Software Engineering	applying uml modeling gathering requirements implementing software designs managing software projects performing software testing writing software documentation	designing software managing projects testing software writing documentation	60	0.67	0.91
MATH3DS	Discrete Structures	applying mathematical logic calculating discrete probabilities constructing proofs designing finite state machines implementing recursion manipulating sets and functions using mathematical induction		0	0.00	0.00
CompOrg	Computer Organization with Microcontroller Programming	assembly language cpu architecture electronics input/output systems memory management microcontroller programming peripheral device interfacing system interfacing		0	0.00	0.00

Infom2	Information Management 2	designing database systems implementing database security managing database concurrency normalizing databases tuning database performance using nosql databases	designing databases tuning databases nosql	43	0.50	0.86
ProElec1	Business Intelligence and Visualization	collecting data creating dashboards creating reports mining data performing data analysis using power bi using tableau	developing dashboards developing reports data mining performing data analysis using power bi tableau	79	0.86	0.93
Techno	Technopreneurship	analyzing market needs building financial models developing business plans pitching business ideas validating product ideas	business plan development	18	0.20	0.92
MATH3C	Analytical Geometry and Calculus	analyzing algorithms applying calculus calculating derivatives calculating integrals performing simulations solving limits using analytical geometry	applying algorithms	11	0.14	0.82
CompF	Computing Fundamentals	computer security exhibit design hardware installation ict presentation skills research skills software installation		0	0.00	0.00

Prog1	Programming Essentials	debugging implementation problem-solving program design programming prototyping requirements analysis software development testing	debugging using prototyping tools unit testing	31	0.33	0.94
CompF	Computing Fundamentals	analyzing computer systems applying computing principles evaluating computer security threats exhibiting ict innovations researching computing industry trends	analyzing security threats	16	0.20	0.80
Prog1	Programming Essentials	analyzing requirements applying cisco programming standards debugging programs designing programs developing project prototypes implementing programs testing programs using fundamental programming constructs	defining requirements debugging testing software	32	0.38	0.85
LITEP	Living in IT Era (for Computing Profession)	analyzing problems communicating ideas visually developing structured solutions flow-charting pseudo-coding		0	0.00	0.00

2D	2D Animation	applying animation principles building game environments creating character designs designing 2d game assets developing game objects evaluating digital media limitations implementing game object behaviors using 2d animation software		0	0.00	0.00
Prog2	Advanced Programming	analyzing requirements applying object-oriented programming principles implementing algorithms leveraging standard libraries testing software using data structures	defining requirements applying object-oriented programming applying algorithms testing software applying data structures	75	0.83	0.90
Python	Introduction to Python	automating tasks with python controlling program flow defining and calling functions defining variables developing web applications with python handling errors in python manipulating data with python using data types using python	automating with python manipulating data using python	30	0.33	0.91
SAD	Systems Analysis and Design	analyzing information systems applying system development life cycle designing information systems developing information systems prototyping systems using case tools using oom tools	using prototyping tools	11	0.14	0.84

3D	3D Animation	creating 3d assets designing virtual worlds developing game-ready animations scripting animations using 3d animation software		0	0.00	0.00
DatSci	Data Science	applying machine learning managing big data mining data using python visualizing data	machine learning data mining using python visualizing data	75	0.80	0.94
DStruc	Data Structures and Algorithms	analyzing algorithm efficiency applying tree algorithms implementing data structures implementing searching algorithms implementing sorting algorithms performing set operations using hashing techniques using stacks and queues working with graphs	applying data structures	9	0.11	0.88
Automata	Automata Theory and Formal Languages	analyzing computational theory applying context-free grammars constructing formal grammars designing compilers designing finite automata implementing pushdown automata processing languages using logic in computation using regular expressions		0	0.00	0.00

CloudApp	Cloud-based Application Development	api development application deployment application security cloud computing cloud platforms devops scalability	developing apis using cloud platforms using devops tools	38	0.43	0.91
HCI	Usability, HCI and User Interaction Design	applying hci principles applying user-centered design practices conducting usability testing creating guis evaluating user experience		0	0.00	0.00
Math4pS	Probability and Statistics	applying probability theory calculating descriptive statistics implementing regression analysis performing hypothesis testing working with probability distributions	regression	16	0.20	0.80
CSSAC	CS Trends, Seminars and Certifications	conducting case studies developing prototypes earning micro-certifications presenting technical information researching emerging technologies		0	0.00	0.00
DatMine	Data Mining and Predictive Analytics using R	building predictive models interpreting analytics performing classification analysis performing clustering analysis performing regression analysis using r	regression	13	0.17	0.83

InfoAs	Information Assurance and Security	analyzing system vulnerabilities applying cryptography handling information assets implementing access control managing risk securing web systems	risk management	14	0.17	0.89
MobApp	Mobile-based Application Development	designing user experiences designing user interfaces developing mobile applications integrating data testing mobile applications using platform-specific apis	designing user interfaces	16	0.17	1.00
NETW1	CCNA: Introduction to Networks	applying subnetting configuring routers configuring switches implementing network security basics implementing tcp/ip troubleshooting networks	configuring routers configuring switches network security	47	0.50	0.96
OS	Operating System	analyzing file systems handling memory implementing security measures managing processes managing threads simulating os behaviors synchronizing resources	implementing security measures	14	0.14	1.00
ProElec3	Machine Learning	building neural networks deploying machine learning models evaluating machine learning models implementing support vector machines performing clustering analysis using ensemble models		0	0.00	0.00



ProElec4	Artificial Intelligence	applying ai algorithms building decision-making models designing ai systems implementing search techniques representing knowledge using ai in analytics using ai in decision support	applying algorithms	12	0.14	0.87
ProLan	Programming Languages	analyzing programming language semantics analyzing programming language syntax developing applications implementing functional programming paradigms implementing imperative programming paradigms implementing logic programming paradigms implementing object-oriented programming paradigms managing memory models using control structures	developing applications object-oriented programming	21	0.22	0.96
WebDev	Web Development Technologies	deploying web applications integrating google analytics performing rest api interactions using git using javascript using node.js using react writing css writing html	using git using javascript using node.js using react writing css writing html	66	0.67	1.00

CompF	Computing Fundamentals	analyzing computer systems applying computing principles evaluating computer security exhibiting ict innovations researching computing industry trends understanding viruses		0	0.00	0.00
ProElec4	Artificial Intelligence	applying ai in analytics building decision-making models designing ai systems implementing search algorithms representing knowledge		0	0.00	0.00
Prog1	Programming Essentials	analyzing requirements applying cisco programming standards debugging programs developing prototypes implementing programming logic testing programs using programming constructs	defining requirements debugging testing software	36	0.43	0.85
LITEP	Living in IT Era (for Computing Profession)	analyzing problems communicating ideas visually developing structured solutions using flowcharts writing pseudocode		0	0.00	0.00
2D	2D Animation	applying animation principles creating 2d environments designing 2d characters implementing 2d game object behavior producing 2d game assets using 2d animation software		0	0.00	0.00

Prog2	Advanced Programming	analyzing requirements applying data structures implementing algorithms testing software using a general-purpose language using standard libraries writing documentation	defining requirements applying data structures applying algorithms testing software writing documentation	66	0.71	0.94
Python	Introduction to Python	automating tasks with python controlling program flow defining and calling functions defining variables developing web applications with python handling errors in python manipulating data with python using data types using python	automating with python manipulating data using python	30	0.33	0.91
SAD	Systems Analysis and Design	analyzing information systems applying system development life cycle designing information systems developing information systems prototyping software using case tools using oom tools	using prototyping tools	12	0.14	0.85
3D	3D Animation	building virtual environments creating 3d assets developing animation sequences implementing game physics rigging characters scripting animations using 3d animation software	applying game physics	12	0.14	0.86

DatSci	Data Science	big data data analysis data mining data visualization machine learning python	data analysis data mining data visualization machine learning python	83	0.83	1.00
DStruc	Data Structures and Algorithms	analyzing algorithm efficiency applying hashing techniques applying tree algorithms implementing data structures implementing searching algorithms implementing sorting algorithms performing set operations using stacks and queues working with graphs	applying data structures	9	0.11	0.88
GameMath	Applied Math for Games	applying statistics applying vector algebra implementing probability modeling game behavior performing analytical geometry simulating game behavior using mathematical equations using mathematical functions using matrices		0	0.00	0.00
Infom1	Information Management 1	creating er diagrams designing database schemas designing databases implementing relational databases modeling data writing sql queries	designing databases designing databases modeling data writing sql queries	63	0.67	0.96

OOPro	Object-Oriented Programming	abstracting systems applying inheritance composing systems defining classes encapsulating data implementing polymorphism using java	using java	14	0.14	1.00
SofEng	Software Engineering	designing software gathering requirements modeling with uml performing quality assurance programming applications testing software writing documentation	designing software performing quality assurance inspections testing software writing documentation	55	0.57	0.97
MATH3DS	Discrete Structures	applying induction and recursion applying mathematical logic calculating discrete probabilities constructing proofs designing finite state machines manipulating sets and functions		0	0.00	0.00
ADA	Analysis and Design of Algorithms	analyzing algorithm performance analyzing algorithm space complexity analyzing algorithm time complexity applying divide and conquer algorithms choosing appropriate algorithms implementing graph algorithms implementing search algorithms implementing sorting algorithms		0	0.00	0.00

Infom2	Information Management 2	implementing database security managing database concurrency normalizing databases tuning database performance using nosql databases	tuning databases nosql	34	0.40	0.85
ProElec1	Business Intelligence and Visualization	collecting data creating dashboards generating reports mining data using power bi using tableau visualizing data	developing dashboards generating reports data mining using power bi tableau visualizing data	81	0.86	0.95
Techno	Technopreneurship	analyzing market needs building financial models conducting market research developing business plans pitching business ideas validating product-market fit	performing market research business plan development	30	0.33	0.91
MATH3C	Analytical Geometry and Calculus	analyzing geometric shapes applying calculus calculating limits modeling mathematical problems performing integration solving differential equations using derivatives		0	0.00	0.00

Automata	Automata Theory and Formal Languages	analyzing computational theory applying computation principles applying formal grammars applying logic principles constructing context-free grammars designing compilers designing finite automata implementing pushdown automata processing languages using regular expressions		0	0.00	0.00
CloudApp	Cloud-based Application Development	applying devops principles building scalable applications deploying cloud applications designing cloud applications developing apis implementing security best practices leveraging cloud services using cloud platforms	implementing devops practices developing apis implementing security best practices using cloud platforms	47	0.50	0.95
HCI	Usability, HCI and User Interaction Design	applying hci principles applying user-centered design practices conducting usability testing creating guis evaluating user experience		0	0.00	0.00
Math4pS	Probability and Statistics	applying probability theory calculating descriptive statistics implementing regression analysis performing hypothesis testing working with probability distributions	regression	16	0.20	0.80

CSSAC	CS Trends, Seminars and Certifications	conducting case studies developing prototypes presenting technical concepts pursuing micro-certifications researching emerging technologies		0	0.00	0.00
DatMine	Data Mining and Predictive Analytics using R	building predictive models interpreting analytics performing classification analysis performing cluster analysis performing regression analysis using r	regression	13	0.17	0.83
InfoAs	Information Assurance and Security	analyzing system vulnerabilities applying cryptography implementing access controls managing risks securing web systems	risk management	16	0.20	0.85
MobApp	Mobile-based Application Development	designing user experiences designing user interfaces developing mobile applications integrating data testing mobile applications using android apis using ios apis	designing user interfaces applying ios apis	26	0.29	0.94
NETW1	CCNA: Introduction to Networks	applying network security concepts applying subnetting configuring routers configuring switches implementing tcp/ip managing vlans troubleshooting networks	network security configuring routers configuring switches	40	0.43	0.95



OS	Operating System	analyzing file systems handling memory implementing security measures managing processes managing threads simulating os behaviors synchronizing resources	implementing security measures	14	0.14	1.00
ProElec3	Machine Learning	building neural networks deploying machine learning models developing machine learning models evaluating machine learning models implementing support vector machines performing clustering analysis using ensemble models		0	0.00	0.00
ProLan	Programming Languages	analyzing programming language semantics analyzing programming language syntax comparing programming languages developing applications implementing functional programming paradigms implementing imperative programming paradigms implementing logic programming paradigms implementing object-oriented programming paradigms managing memory models using control structures	developing applications object-oriented programming	19	0.20	0.96

WebDev	Web Development Technologies	building react applications developing node.js applications integrating google analytics managing versions with git styling with css using javascript writing html	using version control (git using javascript writing html	40	0.43	0.94
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**Note on the formula:**  $score = int(avg\_similarity * coverage * 100)$