



DEAPening Employer Academic Partnerships

DEAP Competencies: Computing Skills

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Introduction

As part of our initiative to determine competencies important to computing professionals, we interviewed 32 individuals in computing related roles who work in a range of industries and have varied roles, responsibilities, and professional and educational backgrounds. We also reviewed 52 articles that included data from computing professionals related to skills, knowledge, and/or dispositions required on the job (with publication dates from 2010-2021). This document is the first draft report of the findings related to Computing Skills from across data sources.

These data sources were analyzed using a thematic analysis. After the initial data analysis, the list of computing skills was reviewed by Dr. Susan Vrbsky, with assistance from other members of the DEAP pilot local team.

Architecture

Design Architecture / System Architecture
Information Technology Architecture
Reviewing Architecture UI Architecture

Cloud Computing Deployment

Build Considerations
Cloud - Documentation
Cloud Based Automation
Cloud Native
Cloud Service Support
Container
Management of Cloud Based Services
Managing VM Build and Destruct Cycles
Migrating to Cloud
Query Data on Cloud
Store to Cloud
Virtualization

Computer Communication Networks

Managing Drive Failures
Network Analysis
Network Infrastructure
Network Typologies and Services
Local Area Network (LAN)
Storage Area network (SAN)
Wide Area network (WAN)

Networking Protocols
Packet Level Analysis
Switching
Traffic Management

Data Processing

Big Data

Big Data (General)
Efficiency Optimization
Scaling Up for Big Data
Minimizing Operations Load
Refactoring Code
Runtime Reduction
SQL Index Modification

Data Analysis
Data Analytics
Data Architecture
Data Management
Data Mining & Warehousing
Data Science Engineering
Data Visualization
Extract Transform Load (ETL)

Database Skills

Audit Reviews
Database Design
Database Management
Database Migration
Database Programming
Database Querying
Database Recovery
Database Skills (General)
Database Types
 NoSQL Database
 SQL Based Serverless Environment
 SQL Database/Relational
 Transactional Databases

**Information Management
Reporting**

Design

Designing High-level Systems
Infrastrucure Design
Interface Design

IT Support

Types of Support Functions
Customer Support
Desktop Support
Field Support
Operations Support
Technical Support

Machine Learning

Modeling

Business Modeling

Data Modeling

UML

Operating Systems Skills

Requirements Engineering

Requirements Analysis and Translation

Requirements Elicitation

Requirements Prioritization

Requirements Scope Creep

Requirements Specifications Writing

Requirements Validating

Review and Recovery Logs

Recovery Logs

Review Logs

Security and Security Policies

General - Security and Policies

Information Assurance

Intrusion Detection and Response

Incident Response

Intrusion Detection

Network Access Management

Network Security - Firewalls

Recovery and Remediation

Social Engineering

Threats and Vulnerabilities

Network Defense Policies and Regulations

Preventive Test Measures

- Conduct Security Audits / Reviews
- Designing and Running Phishing Tests
- Penetration Testing

Running Center for Internet Security Reports

Security Measures

- Blockchain
- Cyber Engineering
- Cybersecurity
- Encryption and Decryption
- Security Sensors
- Signature Security

Software Configuration Management

SCM Process Management

SCM Tools

Software Development

Automation

Backup Software

Code/ Design review

Debugging

Dev Stack Ops

Development Categories

- Building APIs and Orchestration
- Compiler Development
- Database Development
- Full Stack Development
- Library Development
- Mobile App Development
- Platform Development
- Process Flow Development and Optimization

SaaS

Web Application Development

Human-Computer Interaction

Programming Skills

Ability to Switch to Another Language as

Needed Appropriate use of Algorithms

Appropriate Use of APIs and

Frameworks Appropriate use of Libraries

Commenting Code

Knowing More than One Programming

Languages Maintainability

Object Oriented Application

Pair Programming

Performance Optimization

Reading Code

Refactoring

Reusability / Structuring

Scalability

Scripting

Test Driven Development

Using Style Conventions

Working with Inherited Code

Write Self-documenting Code

Software Development Lifecycle

Software Engineering

DevOps

Process Models and Methodologies

Agile

Extreme Programming

General Process Models

Incremental Development Model

Iterative Development Model

Rapid Prototyping

Waterfall Model
Reverse Engineering
Service Delivery
Software Engineering Economics
Software Engineering Management
Software Release Management
Software Reliability and Fault Tolerance
Software/Systems Analysis
Software/Systems Architecture
Software/Systems Design
Standards / Regulations

Software Maintenance

Maintaining Code

Case Analysis of Code
Fixing Broken Code
Maintain (General)
Monitoring Code Functioning

Maintaining Software

Software Project Management

Software Quality Assurance

Software Testing

Architecting Test Tools

Bug Management Systems

Bug Reports Writing

Choosing Testing Methodology

Developing Test Cases

Test Mapping

Test Plan Development

Testing Documentation

Testing Solution

Testing Types

Blackbox Testing

Blended Testing

Developer Testing

Exploratory Testing

Manual Testing

Monkey Testing/Random Testing

Performance Regression Testing

Script-less Test Automation

System Testing

Testing Automation

Unit Testing

Writing Tests

System Administration

Tinkering

Troubleshooting

Usability Engineering

UX/UI

Creating Design Mock Ups

State Management

UI / UX Design

UX Review

Visual Design

Wireframe

Version Control

Web and Internet