{

"courseNumber": "ENSF-409",

"courseName": "Principles of Software Development",

"courseDescription": "A survey of software design and development topics for Engineering students. Topics include: key features of an object-oriented programming language, especially inheritance and polymorphism; elements of object-oriented design; programming and application of common data structures; strategies and tools for testing and debugging.",

"academicCredit": 3,

"lectureHours": 3,

"labHours": 2,

"refUrl": "http://www.ucalgary.ca/pubs/calendar/current/software-engineering-for-engineers.html#38252",

"outcomes": [

{

"oid": 1,

"description": "Have a deep understanding, and practical knowledge of object oriented analysis, design, and development.",

"graduateAttributes": [

{

"gid": "A1",

"description": "A knowledge base for engineering",

"instructionLevel": "Applied"

}

]

},

{

"oid": 2,

"description": "Design and develop software programs in Java.",

"graduateAttributes": [

{

"gid": "A4",

"description": "Design",

"instructionLevel": "Applied"

}

]

},

{

"oid": 3,

"description": "Define the concepts of object-oriented design, such as inheritance and polymorphism.",

"graduateAttributes": [

{

"gid": "A2",

"description": "Problem analysis",

"instructionLevel": "Applied"

}

]

},

{

"oid": 4,

"description": "Apply miscellaneous programming concepts in Java, such as cloning, generic types, multi-threading, event-based programming, etc.",

"graduateAttributes": [

{

"gid": "A5",

"description": "Use of engineering tools",

"instructionLevel": "Applied"

}

]

},

{

"oid": 5,

"description": "Design and develop client-server applications.",

"graduateAttributes": [

{

"gid": "A4",

"description": "Design",

"instructionLevel": "Applied"

}

]

},

{

"oid": 6,

"description": "Use databases to store and retrieve information.",

"graduateAttributes": [

{

"gid": "A3",

"description": "Investigation",

"instructionLevel": "Developed"

}

]

},

{

"oid": 7,

"description": "Use different design and development utilities and tools.",

"graduateAttributes": [

{

"gid": "A5",

"description": "Use of engineering tools",

"instructionLevel": "Developed"

}

]

}

],

"contentCategory": [

{

"math1": **null**,

"math2": **null**,

"mathAU": **null**,

"ns1": **null**,

"ns2": **null**,

"nsAU": **null**,

"cs1": **null**,

"cs2": **null**,

"csAU": **null**,

"esAU": 75,

"edAU": 25

}

],

"sections": [

{

"lectureSections": 1,

"lectureHours": 3,

"lectureNSPS": **null**,

"tutorialSections": **null**,

"tutorialHours": **null**,

"tutorialNSPS": **null**,

"labSections": 1,

"labHours": 2,

"labNSPS": "20-50"

}

],

"labExperience": [

{

"labType": "Project",

"numberOfLabs": 12,

"safetyTaught": **true**,

"safetyExamined": **false**

}

],

"finalGrade": [

{

"assignmentsOutcomes": "1-7",

"assignmentsWeight": 25,

"projectOutcomes": "1-7",

"projectWeight": 10,

"midtermOutcomes": "1-7",

"midtermWeight": 25,

"finalOutcomes": "1-7",

"finalWeight": 40

}

],

"letterGrade": [

{

"apLow": 95,

"apHigh": 100,

"aLow": 90,

"aHigh": 95,

"amLow": 85,

"amHigh": 90,

"bpLow": 80,

"bpHigh": 85,

"bLow": 75,

"bHigh": 80,

"bmLow": 70,

"bmHigh": 75,

"cpLow": 65,

"cpHigh": 70,

"cLow": 60,

"cHigh": 65,

"cmLow": 56,

"cmHigh": 60,

"dpLow": 53,

"dpHigh": 56,

"dLow": 50,

"dHigh": 53,

"fLow": 0,

"fHigh": 50

}

]

}

{

"courseNumber": "ENSF-410",

"courseName": "Principles of Software Development",

"courseDescription": "A survey of software design and development topics for Engineering students. Topics include: key features of an object-oriented programming language, especially inheritance and polymorphism; elements of object-oriented design; programming and application of common data structures; strategies and tools for testing and debugging.",

"academicCredit": 3,

"lectureHours": 3,

"labHours": 2,

"refUrl": "http://www.ucalgary.ca/pubs/calendar/current/software-engineering-for-engineers.html#38252",

"outcomes": [

{

"oid": 1,

"description": "Have a deep understanding, and practical knowledge of object oriented analysis, design, and development.",

"graduateAttributes": [

{

"gid": "A1",

"description": "A knowledge base for engineering",

"instructionLevel": "Applied"

}

]

},

{

"oid": 2,

"description": "Design and develop software programs in Java.",

"graduateAttributes": [

{

"gid": "A4",

"description": "Design",

"instructionLevel": "Applied"

}

]

},

{

"oid": 3,

"description": "Define the concepts of object-oriented design, such as inheritance and polymorphism.",

"graduateAttributes": [

{

"gid": "A2",

"description": "Problem analysis",

"instructionLevel": "Applied"

}

]

},

{

"oid": 4,

"description": "Apply miscellaneous programming concepts in Java, such as cloning, generic types, multi-threading, event-based programming, etc.",

"graduateAttributes": [

{

"gid": "A5",

"description": "Use of engineering tools",

"instructionLevel": "Applied"

}

]

},

{

"oid": 5,

"description": "Design and develop client-server applications.",

"graduateAttributes": [

{

"gid": "A4",

"description": "Design",

"instructionLevel": "Applied"

}

]

},

{

"oid": 6,

"description": "Use databases to store and retrieve information.",

"graduateAttributes": [

{

"gid": "A3",

"description": "Investigation",

"instructionLevel": "Developed"

}

]

},

{

"oid": 7,

"description": "Use different design and development utilities and tools.",

"graduateAttributes": [

{

"gid": "A5",

"description": "Use of engineering tools",

"instructionLevel": "Developed"

}

]

}

],

"contentCategory": [

{

"math1": **null**,

"math2": **null**,

"mathAU": **null**,

"ns1": **null**,

"ns2": **null**,

"nsAU": **null**,

"cs1": **null**,

"cs2": **null**,

"csAU": **null**,

"esAU": 75,

"edAU": 25

}

],

"sections": [

{

"lectureSections": 1,

"lectureHours": 3,

"lectureNSPS": **null**,

"tutorialSections": **null**,

"tutorialHours": **null**,

"tutorialNSPS": **null**,

"labSections": 1,

"labHours": 2,

"labNSPS": "20-50"

}

],

"labExperience": [

{

"labType": "Project",

"numberOfLabs": 12,

"safetyTaught": **true**,

"safetyExamined": **false**

}

],

"finalGrade": [

{

"assignmentsOutcomes": "1-7",

"assignmentsWeight": 25,

"projectOutcomes": "1-7",

"projectWeight": 10,

"midtermOutcomes": "1-7",

"midtermWeight": 25,

"finalOutcomes": "1-7",

"finalWeight": 40

}

],

"letterGrade": [

{

"apLow": 95,

"apHigh": 100,

"aLow": 90,

"aHigh": 95,

"amLow": 85,

"amHigh": 90,

"bpLow": 80,

"bpHigh": 85,

"bLow": 75,

"bHigh": 80,

"bmLow": 70,

"bmHigh": 75,

"cpLow": 65,

"cpHigh": 70,

"cLow": 60,

"cHigh": 65,

"cmLow": 56,

"cmHigh": 60,

"dpLow": 53,

"dpHigh": 56,

"dLow": 50,

"dHigh": 53,

"fLow": 0,

"fHigh": 50

}

]

}

{

"courseNumber": "ENSF 607",

"courseName": "Principles of Software Development",

"courseDescription": "A survey of software design and development topics for Engineering students. Topics include: key features of an object-oriented programming language, especially inheritance and polymorphism; elements of object-oriented design; programming and application of common data structures; strategies and tools for testing and debugging.",

"academicCredit": 3,

"lectureHours": 3,

"labHours": 2,

"refUrl": "http://www.ucalgary.ca/pubs/calendar/current/software-engineering-for-engineers.html#38252",

"outcomes": [

{

"oid": 1,

"description": "Have a deep understanding, and practical knowledge of object oriented analysis, design, and development.",

"graduateAttributes": [

{

"gid": "A1",

"description": "A knowledge base for engineering",

"instructionLevel": "Applied"

}

]

},

{

"oid": 2,

"description": "Design and develop software programs in Java.",

"graduateAttributes": [

{

"gid": "A4",

"description": "Design",

"instructionLevel": "Applied"

}

]

},

{

"oid": 3,

"description": "Define the concepts of object-oriented design, such as inheritance and polymorphism.",

"graduateAttributes": [

{

"gid": "A2",

"description": "Problem analysis",

"instructionLevel": "Applied"

}

]

},

{

"oid": 4,

"description": "Apply miscellaneous programming concepts in Java, such as cloning, generic types, multi-threading, event-based programming, etc.",

"graduateAttributes": [

{

"gid": "A5",

"description": "Use of engineering tools",

"instructionLevel": "Applied"

}

]

},

{

"oid": 5,

"description": "Design and develop client-server applications.",

"graduateAttributes": [

{

"gid": "A4",

"description": "Design",

"instructionLevel": "Applied"

}

]

},

{

"oid": 6,

"description": "Use databases to store and retrieve information.",

"graduateAttributes": [

{

"gid": "A3",

"description": "Investigation",

"instructionLevel": "Developed"

}

]

},

{

"oid": 7,

"description": "Use different design and development utilities and tools.",

"graduateAttributes": [

{

"gid": "A5",

"description": "Use of engineering tools",

"instructionLevel": "Developed"

}

]

}

],

"contentCategory": [

{

"math1": **null**,

"math2": **null**,

"mathAU": **null**,

"ns1": **null**,

"ns2": **null**,

"nsAU": **null**,

"cs1": **null**,

"cs2": **null**,

"csAU": **null**,

"esAU": 75,

"edAU": 25

}

],

"sections": [

{

"lectureSections": 1,

"lectureHours": 3,

"lectureNSPS": **null**,

"tutorialSections": **null**,

"tutorialHours": **null**,

"tutorialNSPS": **null**,

"labSections": 1,

"labHours": 2,

"labNSPS": "20-50"

}

],

"labExperience": [

{

"labType": "Project",

"numberOfLabs": 12,

"safetyTaught": **true**,

"safetyExamined": **false**

}

],

"finalGrade": [

{

"assignmentsOutcomes": "1-7",

"assignmentsWeight": 25,

"projectOutcomes": "1-7",

"projectWeight": 10,

"midtermOutcomes": "1-7",

"midtermWeight": 25,

"finalOutcomes": "1-7",

"finalWeight": 40

}

],

"letterGrade": [

{

"apLow": 95,

"apHigh": 100,

"aLow": 90,

"aHigh": 95,

"amLow": 85,

"amHigh": 90,

"bpLow": 80,

"bpHigh": 85,

"bLow": 75,

"bHigh": 80,

"bmLow": 70,

"bmHigh": 75,

"cpLow": 65,

"cpHigh": 70,

"cLow": 60,

"cHigh": 65,

"cmLow": 56,

"cmHigh": 60,

"dpLow": 53,

"dpHigh": 56,

"dLow": 50,

"dHigh": 53,

"fLow": 0,

"fHigh": 50

}

]

}