Champlain
COLLEGE SAINT-LAMBERT
CONTINUING EDUCATION - FORMATION CONTINUE

SPÉCIALISTE EN RÉALITÉ VIRTUELLE ET AUGMENTÉE

VIRTUAL & AUGMENTED REALITY SPECIALIST

AEC – NTL.1K

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SPÉCIALISTE EN RÉALITÉ VIRTUELLE ET AUGMENTÉE
AEC – NTL.1K

OBJECTIF

Le but de ce programme est de préparer les étudiants à travailler dans le domaine du développement de la réalité virtuelle et augmentée - un secteur d'emploi en croissance rapide. Choisissez l'une des trois (3) voies: productions audiovisuelles immersives VR, AR et / ou 360 °, produisez un portfolio professionnel et complétez un stage en industrie en 12 mois d'études. Votre carrière en réalité virtuel vous attend!

PERSPECTIVES PROFESSIONNELLES

Ce programme s'adresse à ceux qui cherchent à travailler dans les secteurs du divertissement, de l'industrie, de l'éducation et des médias, en particulier dans la création de médias interactifs immersifs et d'outils industriels interactifs pour diverses organisations privées et publiques. Les diplômés de ce programme deviendront des spécialistes dans la création et l'installation de technologies VR / AR / MR pour une gamme d'organisations de divertissement, industrielles et éducatives.

Le spécialistes VR / AR travaillera généralement pour des entreprises de toutes tailles, impliquées dans la production, l'utilisation et le déploiement de médias et de technologies interactifs et immersifs. Le spécialistes de VR / AR peut se retrouver à travailler pour de grandes sociétés de jeux vidéo en tant que développeurs VR, en tant que concepteurs d'outils et spécialistes du déploiement en réalité augmentée (AR); dans les établissements d'enseignement en tant que développeurs d'expériences d'apprentissage interactifs et immersifs, ou même en tant que directeurs de médias impliqués dans la gestion de productions médiatiques interactives.

Les titres d'emploi pour lesquels un diplômé du programme serait qualifié comprennent : développeur multimédia interactif, animateur 3D, programmeur d'application, concepteur publicitaire, développeur de jeux informatiques, directeur de contenu, développeur multimédia, concepteur graphique - nouveaux médias, développeur de logiciels et concepteur multimédia interactif. Le revenu annuel moyen inscrit par Emploi-Québec dans la catégorie des développeurs de médias interactifs (2174) pour les années 2014-2016 est d'environ 60 000 $ pour la région de Montréal.

CANDIDATURES

Le programme Spécialiste en réalité virtuelle et augmentée s'adresse principalement à deux groupes: premièrement, ceux qui recherchent une formation initiale dans le développement et le déploiement de simulations et d'outils de VR/AR, et deuxièmement, ceux qui cherchent à acquérir des compétences complémentaires à leur emploi actuel dans les secteurs de l'informatique ou des médias.

CRITÈRES D'ADMISSION

Les candidats doivent détenir un diplôme d'études secondaires du Québec ou un certificat de fin d'études secondaires ou avoir reçu un enseignement jugé suffisant par le collège et satisfaire aux critères d'admissibilité en vigueur à l'article 4 du Règlement sur les études collégiales (RREC). Les candidats doivent également présenter une preuve d'avoir complété l'un des cours de mathématiques du secondaire suivants ou l'équivalent : Mathématiques TS4, Mathématiques SN4 ou Math CST5. Aucun examen d'entrée n'est requis mais les candidats intéressés seront invités à soumettre un curriculum vitae (CV) accompagné d'une lettre d'intention. La soumission d'un portfolio de travaux professionnels pertinents est aussi requise. Les candidats peuvent être tenus de suivre un cours de rattrapage approprié.

VIRTUAL & AUGMENTED REALITY SPECIALIST
AEC – NTL.1K

PROGRAM OBJECTIVE

The goal of this program is to prepare students for work in the field of Virtual and Augmented Reality development – a fast growing employment sector. Choose one of three (3) pathways: VR, AR and/or 360° immersive media productions, produce a professional portfolio and complete an industry internship all within 12 months of study. Your career in virtual media awaits!

CAREER OUTLOOK

This program is aimed at those seeking to work in the entertainment, industrial, educational and media sectors, specifically in the creation of immersive interactive media and interactive industrial tools for a range of private and public organizations. Graduates of this program will become specialists in the creation and installation of VR/AR/MR technologies for a range of entertainment, industrial and educational organizations.

VR/AR specialists will typically work for companies of all sizes, involved in the production, use and deployment of interactive and immersive media and technologies. VR/AR specialists may find themselves working for large video game companies as VR developers; as industrial augmented reality (AR) tool designers and deployment specialists; in educational institutions as interactive and immersive learning experience developers, or even as media directors involved in the management of interactive media productions.

The job titles for which a graduate of the program would be qualified include: Interactive Media Developer, 3D Animator, Application Programmer, Advertising Designer, Computer Game Developer, Content Director, Multimedia Developer, Graphic Designer – new media, Software Developer and Interactive Media Designer. The average annual income listed by Emploi-Quebec under the Interactive Media Developer category (2174), for the years 2014-2016 is approximately $60,000 for the Montreal region.

TARGETED CLIENTELE

The *Virtual & Augmented Reality Specialist* program is primarily directed at two major groups: first, those seeking initial training in the development and deployment of VR/AR simulations and tools and second, those seeking to gain additional skills that may complement their current employment in the IT or media sectors.

ADMISSION REQUIREMENTS

Candidates must have a Quebec Diploma of Secondary Studies or a High School Leaving Certificate or have received instruction deemed sufficient by the College and meet the eligibility requirements in effect at the time as set forth in Article 4 of the College Education Regulations (RREC). Candidates must also submit proof of having completed one of the following high-school math courses, or equivalent: Math TS4, Math SN4 or Math CST5. There are no entrance exams required but interested candidates will be asked to submit a curriculum vitae (CV) along with a letter of intent. Submitting a portfolio of relevant professional work is also required. Candidates may be required to take an appropriate remedial course(s).

CRITÈRES D'ADMISSION - RREC

Attestation d'Études Collégiales (AEC)

Vous êtes éligible au programme d'Attestation d'Études Collégiales (AEC) si vous êtes soit citoyen canadien ou résident permanent ou êtes le détenteur d'un Visa Étudiant valide, et si vous possédez:

- Un diplôme d'études secondaires **OU**
- Un diplôme d'études collégiales ou universitaires **OU**
- Une formation incomplète dans un programme d'études secondaires, jumelée d'une lettre de recommandation d'un employeur qui atteste qu'il serait bénéfique pour vous de poursuivre des études postsecondaires.

ET

Vous rencontrez **une** des trois conditions suivantes:

- Vous avez terminé vos études depuis au moins deux sessions consécutives ou une année scolaire (12 mois).
- Vous êtes visé par une entente conclue entre le collège et un employeur, ou par une entente conclue entre le collège et un programme gouvernemental **(EMPLOI-QUÉBEC)**.
- Vous avez complété une année ou plus d'études postsecondaires échelonnées sur une période d'un an ou plus.

ADMISSION CRITERIA - RREC

Attestation of Collegial Studies (AEC)

You are eligible to register in an Attestation of Collegial Studies (AEC) program if you are a Canadian Citizen or Permanent Resident or the holder of a valid Student Visa, and if you have the following:

- A Diploma of High School Studies **OR**
- A College Diploma or a University Degree **OR**
- A partial high school program, coupled with a recommendation from a current or former employer that you would benefit from pursuing your education at the post-secondary level.

AND

You meet **one** of the following three conditions:

- You have not been a full-time student for at least two consecutive terms or one school year within the last 12 months.
- You are part of an agreement between the college and an employer, or you are sponsored within the terms of a government program **(EMPLOI-QUÉBEC)**.
- You have completed at least one year of post-secondary studies spread over a period of one year or more.

Document Submission Guidelines

1) CV *(Submitted via Omnivox during online application)

Please submit your CV before or at the time of application. This is usually done during information sessions. If you do not have your CV with you during an info session, make sure to submit it within 48 hours after having applied. You can also bring a paper copy to an information session.

2) Letter of Intent *(Submitted within 10 business days of applying online)

The letter of intent serves to gauge your level of motivation to study VR/AR technologies. Please compose a letter of intent of no more than 250 words, outlining any relevant experience in 3D Animation, Art, Programming and/or TV/Film productions. Also, make sure to mention why you are interested in studying in this program, as well as what you think you will be doing in 5 years after graduating. You will receive an email inviting you to submit the letter of intent. Please do so within 48 hours.

- 1- page maximum (250 words)
- Describe your motivation to study VR/AR at Champlain
- Highlight relevant experience in animation, art, programming and/or TV productions

Criteria	Excellent	Adequate	Inadequate
Length	250 words ± 50	Less than 200 words	100 words or less
Motivation to Study	The candidate exhibits a high level of the following traits: -curiosity -passion -creativity -desire to experiment -team work skills	The candidate exhibits some of the following traits: -curiosity -passion -creativity -desire to experiment -team work skills	The candidate exhibits few or none of the following traits: -curiosity -passion -creativity -desire to experiment -team work skills
Future Goals	The candidate has a clear and realistic future plan.	The candidate has somewhat of a clear future plan.	The candidate does not have a coherent future plan.
Experience	The candidate has considerable experience in at least one of the fields of application (3D Animation, Programming, Unity and Unreal, TV Productions)	The candidate has foundational experience in at least one of the fields of application (3D Animation, Programming, Unity and Unreal, TV Productions)	The candidate does not have any experience in at least one of the fields of application (3D Animation, Programming, Unity and Unreal, TV Productions)

3) Portfolio *(Submitted within 10 business days of applying online)

The portfolio serves to gauge your level of experience and ability in all or one of the relevant VR/AR disciplines. Start by thinking of the following disciplines and choose one that best matches your past experience. You may wish to provide work(s) and documentation on more than one discipline, but try to focus on your strongest. Don't worry if you feel that you do not have much to share. You can always submit new work. You will receive an email inviting you to submit your portfolio. Please do so within 48 hours.

- 4 to 12 pages
- Based on relevant work in all or 1 of the following fields: 3D Animation, Programming and/or TV Productions.

Disciplines:

- Animation, 3D Animation, 2D Animation (Maya, 3DS Max, etc.)
- Programing, Python, C#, C++, Unity, Unreal, etc.
- TV Productions, Sound Recording/Engineering, Photography, Film Production, Scriptwriting & Storyboarding, Lighting, etc.
- Industrial Design, Mobile devices, Electronics, Hardware, Motion Capture, etc.

Criteria	Excellent	Adequate	Inadequate
Length	8 to 12 pages submitted	Less than 8 pages	Less than 4 pages
Choice and Relevance of Discipline	The candidate has provided samples of work that are highly relevant to VR/AR technologies and experiences. The work contains clear examples of one or more relevant disciplines.	The candidate has provided samples of work that are somewhat relevant to VR/AR technologies and experiences. The work contains examples of at least one relevant discipline.	The candidate has provided samples of work that are not relevant to VR/AR technologies and experiences. The work does not contain examples of at least one relevant discipline.
Quality of Work	The work is of professional grade in at least one relevant discipline.	The work is of novice grade in at least one relevant discipline.	The work is of initiate grade in all relevant disciplines.
Future Potential	• The candidate exhibits a strong desire to experiment • The candidate exhibits a highly creative nature • The candidate is in tune with user needs.	•The candidate exhibits a desire to experiment •The candidate exhibits creativity	•The candidate does not exhibit a desire to experiment •The candidate does not exhibit a highly creative nature

RENSEIGNEMENTS GÉNÉRAUX

Date prévue de début de programme: le 28 novembre 2022
Date prévue de fin de programme: le 24 novembre 2023
Période de stage : les 4 dernières semaines (du 30 octobre au 24 novembre 2023)
Schedule: du lundi au vendredi (9h00 – 16h00)

CONTENU DU PROGRAMME

Cours	Titre de cours	Heures
420-104-LA	Introduction aux technologies VR / AR	60
420-105-LA	Programmation pour VR 1 - Python et algorithmes	90
574-101-LA	Scénarisation et storyboard pour VR	60
574-102-LA	Architecture 3D immersive	90
589-101-LA	360° Vidéos - Capture vidéo et audio dimensionnelle	90
420-204-LA	Programmation pour VR 2 - C # & Unity	90
574-201-LA	UX / UI et systèmes de perception du corps humain	60
574-202-LA	Animation 3D expérientielle	90
420-205-LA	Kits de développement logiciel et matériel	60
589-2A1-LA	VR Portfolio 1 - Planification et prix	60
420-304-LA	Programmation pour VR 3 - C ++ & Unreal	90
574-301-LA	After Effects et Post-Production	60
589-3A1-LA	VR Portfolio 2 - Production et présentation	60
574-501-LA	Stage VR	120
	Total	**1080**

L'attestation d'études collégiales (AEC) « Spécialiste en réalité virtuelle et augmenté » vise l'acquisition des compétences suivantes :

BK03 Analyzer la fonction de travail.
BK04 Utiliser les langues de programmation et les outils associés.
BK05 Résoudre des problèmes informatiques en utilisant les mathématiques et algorithmes.
BK06 Produire des scripts et storyboards.
BK07 Concevoir des environnements 3D immersifs.
BK08 Assembler des éléments média.
BK09 Produire des images générées par ordinateur.
BK10 Préparer un éclairage réel ou simulé.
BK11 Enregistrer du vidéo.
BK12 Produire des sons binauraux immersifs.
BK13 Travailler en équipe.
BK14 Développer des jeux ou des applications de simulation VR / AR.
BK15 Analyser les productions VR, AR et 360º.
BK16 Représenter le mouvement en trois dimensions.
BK17 Animer les personnages.
BK18 Créer des effets visuels numériques.
BK19 Évaluer les composants matériels et logiciels.
BK20 Développer des applications pour les objets connectés.
BK21 Planifier la production et la post-production.
BK22 Coordonner les activités du studio et du studio.
BK23 Préparez à entrer sur le marché de travail.
BK24 Produire des productions finales VR / AR.
BK25 Interagir dans un contexte professionnel.

FRAIS

Demande d'admission (nouvel étudiant)	30,00 $
Inscription (150,00 $ par semestre x 3 semestres)	450,00 $ *
Cadenas pour casier	10,00 $ **
Sorties et autres provisions	300,00 $ **
Livres	250,00 $ **
Disque dur (1 TB)	150.00 $ **
Divers (papier, crayon, etc.)	40,00 $ **

**Les frais peuvent varier selon votre statut de résident au Québec*
***Montant approximatif*

Veuillez noter que l'abandon ou l'échec d'un cours pourrait changer votre statut d'étudiant(e) et vous occasionner des frais de scolarité (par exemple - des frais d'inscription de 25,00$ par cours). Aussi, l'abandon ou l'échec de(s) cours au sein de votre programme d'attestation pourrait vous occasionner un délai ou vous empêcher de compléter avec succès votre programme d'études tel que prévu puisque le Collège ne peut garantir l'offre de ce programme lors de sessions subséquentes.

Informations et coûts sujets au changement.
Dans le but de nous assurer que nos finissants répondent aux exigences du marché du travail, le Collège se réserve le droit de modifier, au besoin, des portions du programme.

GENERAL INFORMATION

Anticipated start date:	November 28, 2022
Anticipated end date:	November 24, 2023
Internship:	The last 4 weeks (October 30 to November 24, 2023)
Schedule:	Monday to Friday (9:00 a.m. – 4:00 p.m.)

PROGRAM CONTENT

Cours	Titre de cours	Heures
420-104-LA	Introduction to VR/AR Technologies	60
420-105-LA	Programming for VR 1 – Python & Algorithms	90
574-101-LA	Scriptwriting & Storyboarding for VR	60
574-102-LA	Immersive 3D Architecture	90
589-101-LA	360° Videos - Dimensional Video & Audio Capture	90
420-204-LA	Programming for VR 2 – C# & Unity	90
574-201-LA	UX/UI & Human Body Perception Systems	60
574-202-LA	Experiential 3D Animation	90
420-205-LA	Software Development Kits & Hardware	60
589-2A1-LA	VR Portfolio 1 – Planning & Pricing	60
420-304-LA	Programming for VR 3 – C++ & Unreal	90
574-301-LA	After Effects and Post-Production	60
589-3A1-LA	VR Portfolio 2 - Production & Presentation	60
574-501-LA	VR Internship	120
	Total	**1080**

The Virtual & Augmented Reality Specialist (NTL.1K) AEC program targets the acquisition of the following competencies:

BK03 Analyze the work function.
BK04 Use programming languages and associated tools.
BK05 Solve computer-related problems using algorithms and mathematics.
BK06 Produce scripts and storyboards.
BK07 Design immersive 3D environments.
BK08 Assemble media elements.
BK09 Produce computer-generated images.
BK10 Prepare real or simulated lighting.
BK11 Record video.
BK12 Produce immersive binaural sounds.
BK13 Work in a team.
BK14 Develop VR/AR game or simulation applications.
BK15 Analyze VR, AR and 360º productions.
BK16 Represent movement in three dimensions.
BK17 Animate characters.
BK18 Create digital visual effects.
BK19 Evaluate hardware and software components.
BK20 Develop applications for connected objects.
BK21 Plan production and post-production.
BK22 Coordinate set and studio activities.
BK23 Prepare to enter the workforce.
BK24 Produce VR/AR final productions.
BK25 Interact in a professional context.

FEES

Application Fee (new student)	$30.00
Registration Fee ($150.00 per semester x 3 semesters)	$450.00 *
Lock for locker	$10.00 **
Outings & Other Supplies	$300.00 **
Books	$250.00 **
Hard drive (min. 1 TB)	$150.00 **
Miscellaneous (paper, pens, etc.)	$40.00 **

**Fee may vary depending upon Québec Residency Status*
***Fees are approximate*

Please note that if you choose to withdraw from a course(s) or if you fail a course(s), it may affect your student status and you may have to pay tuition fees – (Example - a $25.00 registration fee per course). Also, by withdrawing from a course(s) or failing a course(s) within your Attestation program, it may make it difficult or impossible for you to continue with your program at that time, it may delay you in the completion of your program, or it may hinder your opportunity to complete the program as the College cannot guarantee that the program will continue to be offered in the future.

Information and fees are subject to change.
In order to more fully ensure that our graduates are competitive in the marketplace, the College reserves the right to modify portions of this program at any time.

COURSE DESCRIPTIONS

COURSE	DESCRIPTION
INTRODUCTION TO VR/AR TECHNOLOGIES **420-104-LA 2-2-2** **60 HOURS** Competency: **BK03** Pre-requisite: **None**	This course provides students with an opportunity to thoroughly analyze the current state of the interactive VR and AR industries, its associated technologies and major players. Students will also have the opportunity to examine the rapid evolution of these technologies and applications and project their development over the coming years. Through in-depth analyses of the major players and their activities, students will develop a sense of the activities, tasks and behaviors required in these professional fields. Topics include: The examination of differences between VR, AR and MR technologies, an overview of software development kits and their associated hardware as well as examining the industries to which these apply.
PROGRAMMING FOR VR 1 – PYTHON & ALGORITHMS **420-105-LA 3-3-3** **90 HOURS** Competency: **BK04, BK05** Pre-requisite: **None**	This course provides students with an introduction to algorithmic problem-solving approaches and basic coding procedures as they apply to the development of interactive media software and applications. Using a project-based approach, students will develop an understanding of encoding standards, debugging procedures and scripting approaches through authentic case studies and development projects. Through the analysis, revision and production of code, students will implement solutions to solve the issues presented in these case studies. Topics include: the translation of algorithms into code, the representation of geometric figures in digital form and the modeling of multi-variable logical reasoning.
SCRIPTING AND STORYBOARDING FOR VR **574-101-LA 2-2-2** **60 HOURS** Competency: **BK06** Prerequisite: **None**	This course provides students with an introduction and ample practice in scriptwriting and storyboarding as they apply to VR. The development of immersive VR experiences requires a very strong conceptual foundation that is initially produced through scriptwriting, storyboarding and concept sketches. Using a project-based approach, students will produce several scripts, storyboards and concept sketches that would qualify as quality foundations for productions in VR, AR and 360 degree videos. Topics include: the analysis of professional scripts and storyboards, the use of scriptwriting software for interactive media, the breakdown of actions and media elements into frames/environments and assembling these into a storyboard.
IMMERSIVE 3D ARCHITECTURE **574-102-LA 3-3-3** **90 HOURS** Competency: **BK07, BK08, BK09** Pre-requisite: **None**	This course provides students with an introduction and ample practice in the design and development of 3D environments and architecture. Using a project-based approach, students will learn to produce computer generated images, 3D objects and environments using software applications. Students will be able to assemble these elements into functional immersive 3D environments. Topics include: BIM software (Autodesk), 3D Studio Max, APIs, OpenGL & Direct 3D.
360º VIDEOS – DIMENSIONAL VIDEO & AUDIO CAPTURE **589-101-LA 2-4-2** **90 HOURS** Competency: **BK10, BK11, BK12, BK13** Prerequisite: **None**	This course provides students with an introduction and ample practice in video and audio capture for 360º immersive video and VR productions. Using a project-based approach, students will learn to set up 360º camera arrays, consider points of view and dead angles, stitch and produce finished videos as well as adequately record, master and edit binaural sound recordings and productions. Students will be tasked with the production of a short 360º video that will be presented/experienced and assessed by their peers. Topics include: Dimensional (binaural) Audio Capture, Camera Arrays, DSLR Systems, Red Camera Systems, Lightfields & 6DoF.

PROGRAMMING FOR VR 2 – C# & UNITY **420-204-LA 3-3-3** **90 HOURS** Competency: **BK14** Prerequisite: **420-105-LA**	This course provides students with in-depth analysis and use of the Unity engine and its associated C# programming language. Using a project-based approach, students will become adept at programing in C# and will have the opportunity to produce a VR simulation through object-oriented programming. Topics include: C# scripting, Unity, class modeling and programming, simulation logic & VR representations.
UX/UI & HUMAN BODY PERCEPTION SYSTEMS **574-201-LA 2-2-2** **60 HOURS** Competency: **BK15** Prerequisite: **589-101-LA**	This course provides students with an opportunity to examine how the human body perceives stimuli and how this theory applies to the world of VR and AR simulations. Through in-depth analyses of existing VR and AR experiences, students will develop an ability to analyze productions in their efficacy in relating to human perception. Students will also learn to integrate this type of consideration into their planning for a VR development project considering such notions as VR ergonomics and interface design. Topics include: the analysis of narrative structures and user experience (UX), user-interface design (UI), aesthetic qualities and human body perceptions systems.
EXPERIENTIAL 3D ANIMATION **574-202-LA 3-3-3** **90 HOURS** Competency: **BK16, BK17** Prerequisite: **574-102-LA**	This course provides students with an in-depth practical workshop in the design and development of 3D characters, animations and digital visual special effects. Using a project-based approach, students will learn to represent movement in 3D, design and animate 3D objects as well as become adept in the use of 3D design software. Topics include: (Autodesk), polygons and latency, 3D Studio Max, Blueprint & APIs.
SOFTWARE DEVELOPMENT KITS & HARDWARE **420-205-LA 2-2-2** **60 HOURS** Competency: **BK19, BK20** Prerequisite: **420-104-LA** **(Co-req)** **589-2A1-LA**	This course provides students with an in-depth analysis of proprietary software development kits (SDKs) in VR/AR and their associated technologies. This course aims to prepare students to enter the VR/AR development world properly equipped with the procedures, notions and technologies that are central to the distribution and use of VR/AR experiences. Through in-class experiences and direct manipulation of various technologies, students will gain in-depth insight into the pros and cons of each available SDK. Topics include: HTC Vive & HTCdev, Oculus Rift & Oculus SDK, Hololens SD, Google Cardboard & Google VR SDK.
VR PORTFOLIO 1 – PLANNING & PRICING **589-2A1-LA 1-3-2** **60 HOURS** Competency: **BK21** Prerequisite: **420-104-LA** **574-101-LA** **574-102-LA** **589-101-LA** **(Co-req)** **420-205-LA**	This course starts students on their path to creating an original VR/AR simulation, to be uploaded and shared through their choice of SDK. Students are tasked with researching possible types of productions, selecting an option from VR, AR and/or 360 degree immersive videos. Students then plan their development project; completing the script and storyboard, budget analysis and determining all of the necessary equipment, accessories and software required in realizing this project. Students are also asked to plan their deployment project using industry specific project-management software. Topics include: SDKs and specifics, VR hardware, Agile & Scrum processes.

PROGRAMMING FOR VR 3 – C++ & UNREAL **420-304-LA 3-3-3** **90 HOURS** Competency: **BK14** Prerequisite: **420-204-LA**	This course provides students with an in-depth analysis of the C++ programming language and use of the Unreal development engine. Using a project-based approach, students will be initiated to the C++ programming language and will have the opportunity to produce a VR simulation through object-oriented programming using the Unreal engine. Topics include: C++ scripting, Unreal, class modeling and programming, simulation logic & VR representations.
AFTER EFFECTS & POST-PRODUCTION **574-301-LA 1-3-2** **60 HOURS** Competency: **BK18** Prerequisite: **574-202-LA**	This course provides students with an in-depth practical workshop in the design and development of special effects, video stitching & editing, sound design and mixing as well as other after effects such as texturing. Using a project-based approach, students will add after effects to one of their previous VR, AR or 360 video projects. Topics include: 3D Studio Max, Houdini & Adobe Creative Cloud.
VR PORTFOLIO 2 – PRODUCTION & PRESENTATION **589-3A1-LA 1-3-3** **60 HOURS** Competency: **BK22, BK24** Prerequisite: **589-2A1-LA** **420-204-LA**	This course follows from the previous portfolio course, prompting students to produce and present their selected project. Working with their storyboards and selected technologies, students will produce a VR, AR simulation or 360º degree video and share it through the appropriate SDK. The final presentation of their development project will be done through the actual experience using the appropriate technologies. Class peers will experience the production and provide the student developer with feedback on all relevant aspects of the production, from technical to aesthetic. Topics include: all previous program content.
VR/AR INTERNSHIP **575-501-LA 1-7-3** **120 HOURS**	This course takes the form of either a 120-hour internship or a contractual development project with an interested third party. Students will have the choice to either pursue an internship with a relevant company and complete 120 hours of professional work, or produce an interactive media tool as entrepreneurs for a specific client with approximately the same time requirement. Students are thus tasked with approaching companies for possible internships and/or offering companies and individuals their services in developing a VR, AR or 360º degree tool. Topics include: all previous program content.

COURSES: FLOWCHART