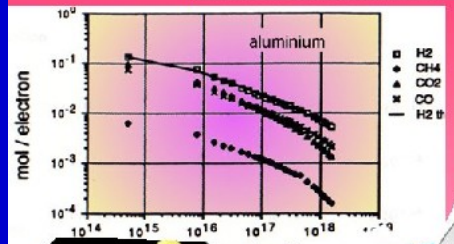
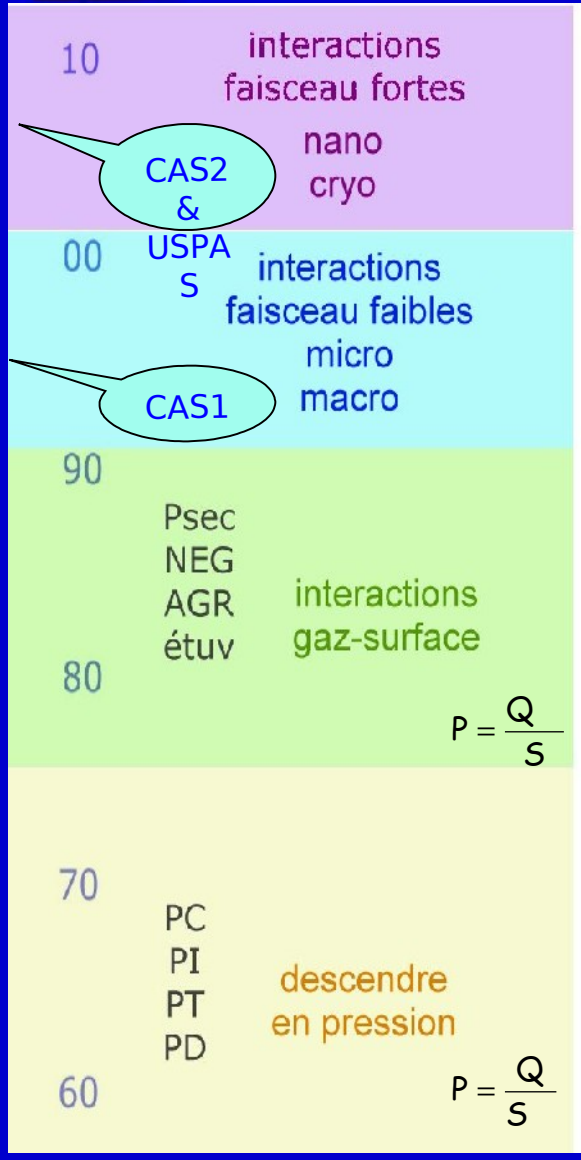
EVOLUTION de L'ENSEIGNEMENT du VIDE



J.ARIANER

Un peu d'histoire du « vidiste de labo λ »



+ *Physique nucléaire-Radioprotection-*
Résistance des matériaux aux rayons

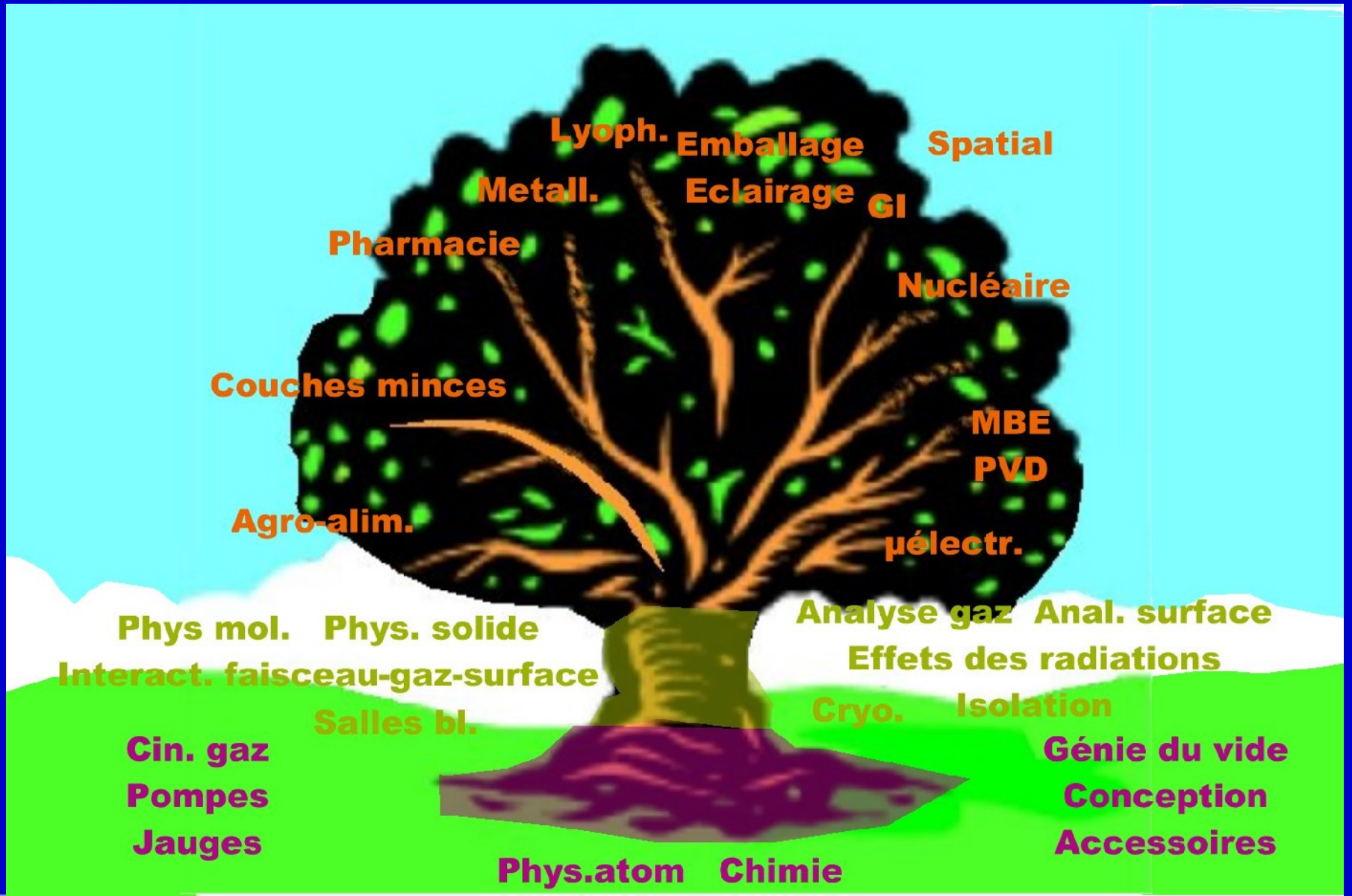
+*Interactions faisceau-matière-Plasma-Lasers*

+*Physique du Solide & des Surfaces- Désorption - Diffusion*

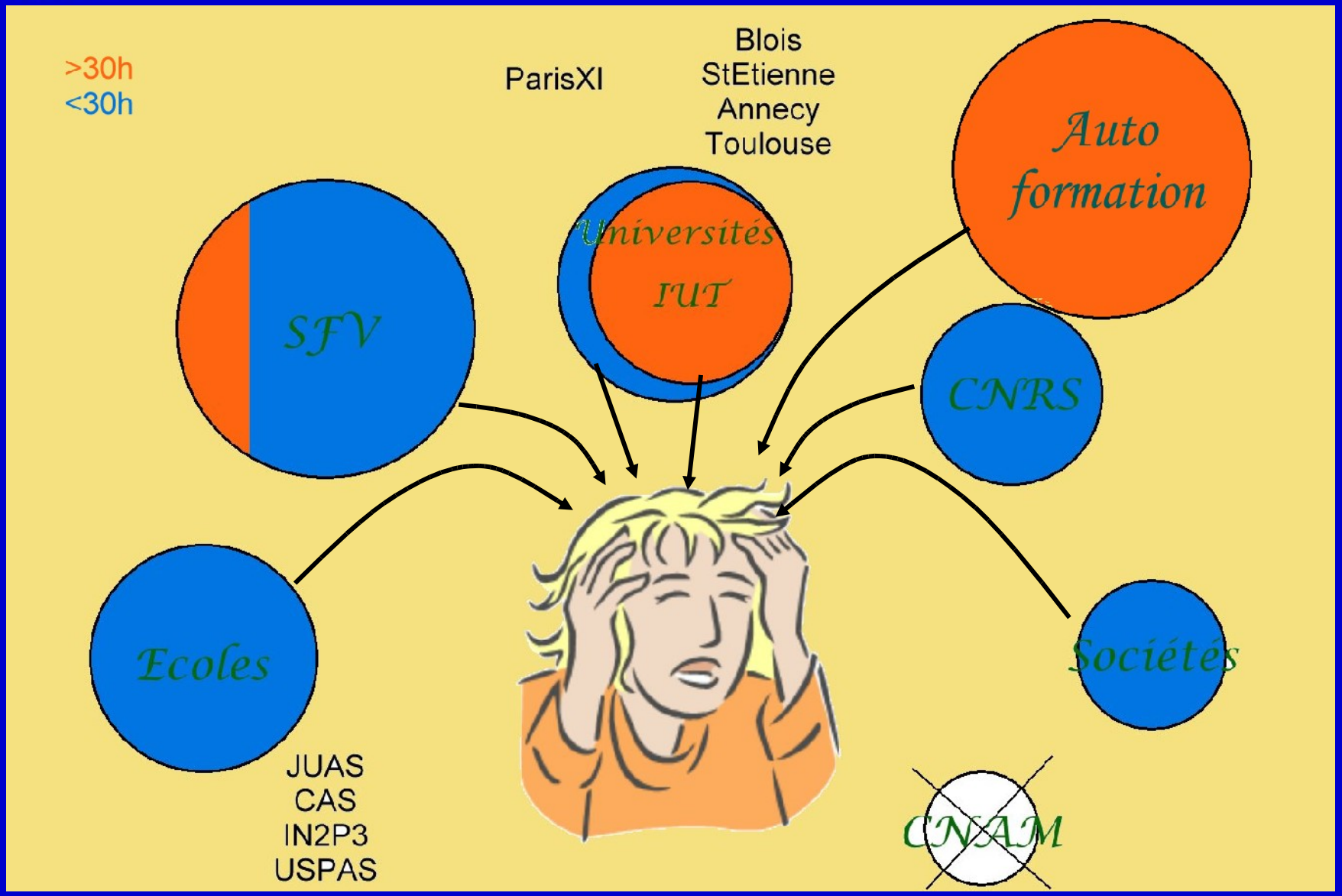
+*Chimie & Bases en Structure de la Matière*

Ecoulements- Génie du Vide

Vidiste, un métier et des savoirs



L’enseignement: état des lieux



L’enseignement: état des lieux

IUT

Stages

Ecoles

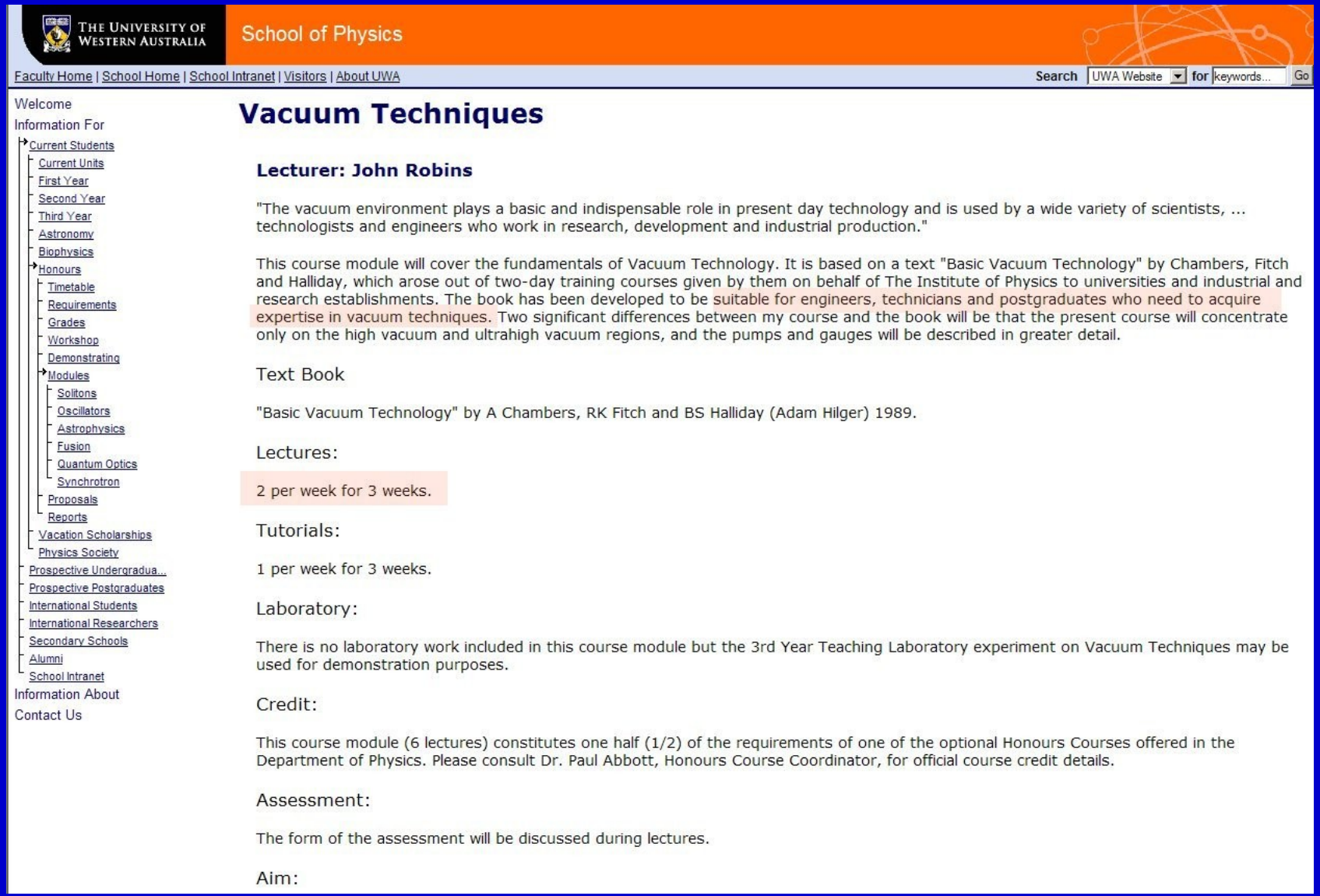
Autoformation

On ne retient bien que ce qui a été appris, oublié et réactivé plusieurs fois.

Le problème de l’enseignant est de faire transiter les connaissances et le savoir-faire de la mémoire immédiate vers la mémoire moyenne puis profonde.

D'après "mémoriser au cycle 3" Nathan pédagogie – Les pratiques de l'éducation

L'enseignement (trop) court:



THE UNIVERSITY OF WESTERN AUSTRALIA — School of Physics

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Vacuum Techniques

Lecturer: John Robins

"The vacuum environment plays a basic and indispensable role in present day technology and is used by a wide variety of scientists, ... technologists and engineers who work in research, development and industrial production."

This course module will cover the fundamentals of Vacuum Technology. It is based on a text "Basic Vacuum Technology" by Chambers, Fitch and Halliday, which arose out of two-day training courses given by them on behalf of The Institute of Physics to universities and industrial and research establishments. The book has been developed to be suitable for engineers, technicians and postgraduates who need to acquire expertise in vacuum techniques. Two significant differences between my course and the book will be that the present course will concentrate only on the high vacuum and ultrahigh vacuum regions, and the pumps and gauges will be described in greater detail.

Text Book

"Basic Vacuum Technology" by A Chambers, RK Fitch and BS Halliday (Adam Hilger) 1989.

Lectures:

2 per week for 3 weeks.

Tutorials:

1 per week for 3 weeks.

Laboratory:

There is no laboratory work included in this course module but the 3rd Year Teaching Laboratory experiment on Vacuum Techniques may be used for demonstration purposes.

Credit:

This course module (6 lectures) constitutes one half (1/2) of the requirements of one of the optional Honours Courses offered in the Department of Physics. Please consult Dr. Paul Abbott, Honours Course Coordinator, for official course credit details.

Assessment:

The form of the assessment will be discussed during lectures.

Aim:

L'enseignement (trop) court:

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- Vacuum technology short course
- Contact

Short course in Vacuum Technology

Department of Physics, University of York, England

Next course: TBA

Following the successful pattern established in previous years, we offer a course of two working days duration in basic vacuum technology. Its purpose is to describe and explain the various techniques for the production, measurement and testing of vacuum in various ranges, to give an understanding of the important physical principles involved, and to show how they are applied in the design and operation of representative systems. Participants come from a wide range of backgrounds including technical staff from industry and universities, and postgraduate students.

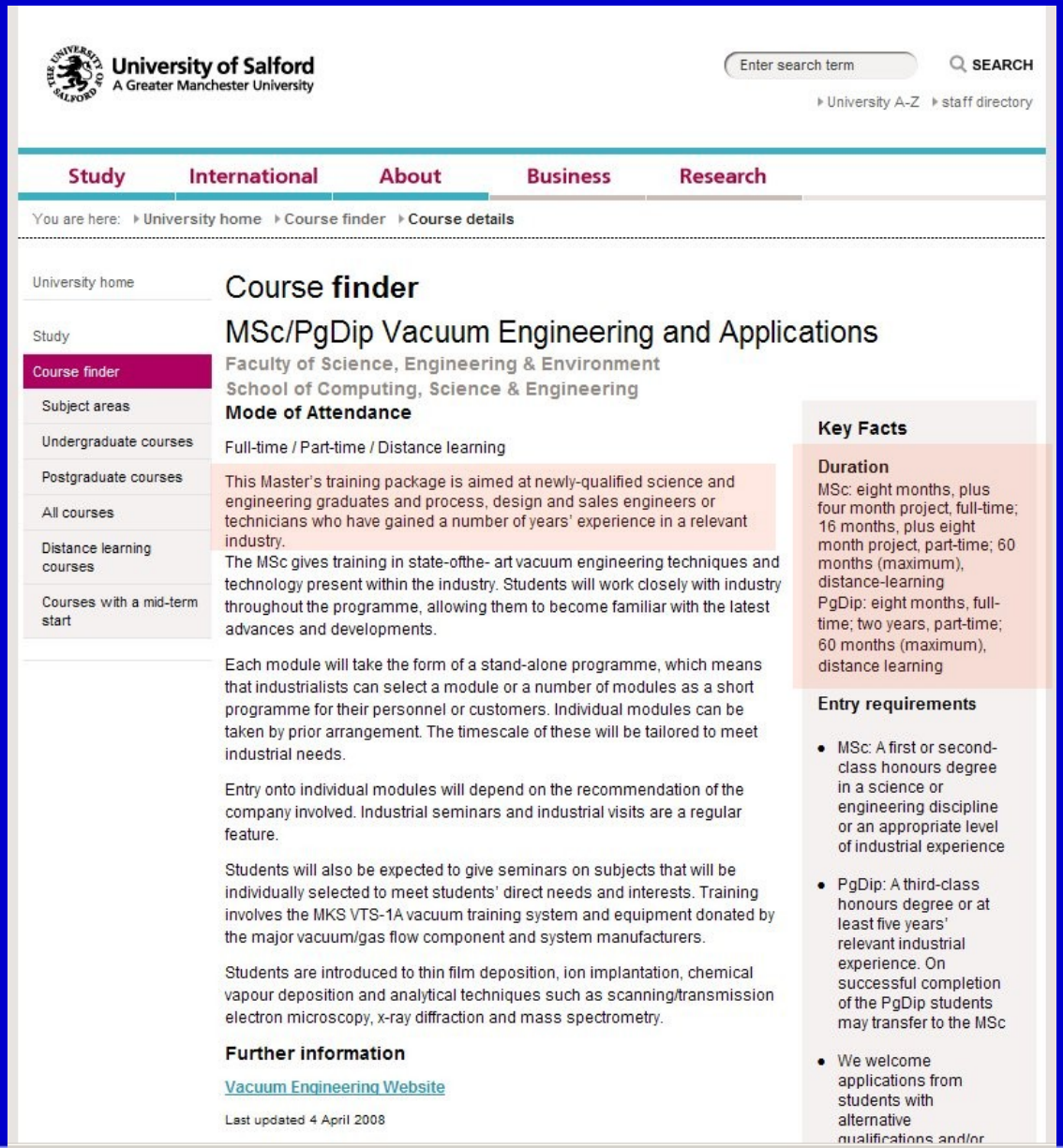
Content

- Relevant properties of gases, macroscopic and molecular
- Continuum and molecular states of gas, Knudsen number
- Gases in vacuum systems: gas sources, outgassing
- Flow of gases: viscous and molecular. Throughput, speed, and conductance
- The pumping process, pumping times and ultimate pressure
- Pumps: principles, performance and operational concerns
- Pressure measurement: total and partial pressure gauges, principles and operational concerns, accuracy and stability
- Residual gas analysis, interpretation of spectra
- Vacuum components and devices, materials and cleaning
- High voltage in vacuum
- Leak detection
- Typical systems, worked examples
- Exercises related to basic matters and simple design problems

Delivery

Our aim is to present the subject in a plain-language way that emphasises basic understanding of technical and operational matters. The course is lecture-based but informal with time allowed for discussion, and includes demonstrations and exercises. A substantial course book is provided to make detailed note-taking unnecessary, so that participants are free to concentrate on the messages of the course, with the book serving as a textual record for later reference and further use. The course team consists of Dr Austin Chambers and Dr Marcus Jacka (formerly) of the University of York. The team has considerable experience of teaching the subject, having given courses on numerous occasions in various industrial and government laboratories as well as at the University of York. The course book, the second edition of Basic Vacuum Technology by Chambers, Fitch and Halliday, is the outcome of teaching experience of the subject.

Que faire?



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A Greater Manchester University

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Course finder

MSc/PgDip Vacuum Engineering and Applications

Faculty of Science, Engineering & Environment
School of Computing, Science & Engineering

Mode of Attendance

Full-time / Part-time / Distance learning

This Master's training package is aimed at newly-qualified science and engineering graduates and process, design and sales engineers or technicians who have gained a number of years' experience in a relevant industry.

The MSc gives training in state-ofthe- art vacuum engineering techniques and technology present within the industry. Students will work closely with industry throughout the programme, allowing them to become familiar with the latest advances and developments.

Each module will take the form of a stand-alone programme, which means that industrialists can select a module or a number of modules as a short programme for their personnel or customers. Individual modules can be taken by prior arrangement. The timescale of these will be tailored to meet industrial needs.

Entry onto individual modules will depend on the recommendation of the company involved. Industrial seminars and industrial visits are a regular feature.

Students will also be expected to give seminars on subjects that will be individually selected to meet students' direct needs and interests. Training involves the MKS VTS-1A vacuum training system and equipment donated by the major vacuum/gas flow component and system manufacturers.

Students are introduced to thin film deposition, ion implantation, chemical vapour deposition and analytical techniques such as scanning/transmission electron microscopy, x-ray diffraction and mass spectrometry.

Further information

Vacuum Engineering Website

Last updated 4 April 2008

Key Facts

Duration

MSc: eight months, plus four month project, full-time; 16 months, plus eight month project, part-time; 60 months (maximum), distance-learning
PgDip: eight months, full-time; two years, part-time; 60 months (maximum), distance learning

Entry requirements

- MSc: A first or second-class honours degree in a science or engineering discipline or an appropriate level of industrial experience
- PgDip: A third-class honours degree or at least five years' relevant industrial experience. On successful completion of the PgDip students may transfer to the MSc
- We welcome applications from students with alternative qualifications and/or

Que faire?

Technologie du Vide et Traitement sous Vide des Matériaux

Programme de la formation

UE1 – Formation scientifique (90h)
- Mathématiques appliquées
- Physique
- Plasmas
- Matériaux

UE2 – Communication, entreprise (120 h)
- Expression, communication
- Anglais
- Economie d'entreprise
- Organisation et droit du travail
- Qualité
- Méthodes

UE3 – Technologie du vide (120 h)
- Vide et cinétique des gaz
- Technologie de pompage
- Contrôles et mesures sous vide
- Conception d'installations sous vide
- Conditions extrêmes : salles blanches, cryogénie

Microscope électronique à balayage

UE4 – Traitements de surfaces (60 h)
- Procédés industriels
- Etude de cas

UE5 – Caractérisation des matériaux (75 h)
- Bases méthodologiques
- Méthodes de caractérisation
- Travaux pratiques

UE6 – Projet tutoré (100 h)
- Réalisation d'un projet de nature technico-économique

UE7 – Travail en entreprise (1200 h)
- Développement, réalisation, suivi d'un projet confié par l'entreprise

Enceinte de dépôt sous vide

Rythme d'alternance

- Formation IUT : séquences de 3 semaines (1/3 du temps)
- Travail en entreprise : développement, réalisation, suivi du projet confié par l'entreprise (2/3 du temps)

Que faire?


VIDAP
Vide et applications
MÉCANIQUE
IUT Annecy
tétras
Formation en alternance
DURÉE ET ORGANISATION DE L'ALTERNANCE
12 mois dont 1/4 du temps en formation (environ 1 semaine par mois), et 3/4 du temps en entreprise
Démarrage de la formation en octobre
CONTENU DE LA FORMATION
Technologie du vide
Pompage
Mesure et instrumentation
Conception d'une installation
Détection de fuites
Maintenance
Comportement des matériaux
Conditions extrêmes
Applications industrielles
Microélectronique
Métallurgie
Santé et agroalimentaire
Cryogénie et applications
Techniques scientifiques
Statistiques, outils de calcul
Physique, matière, cinétique des gaz, mécanique des fluides, thermique, interactions gaz surface
Electrotechnique, électronique, instrumentation
Métrologie, gestion de la maintenance
Communication Management
Communication management
Droit économie
Méthodes et qualité
Anglais (possibilité de passer le TOEIC)

Que faire? Aller au-delà!

Susciter les vocations par une meilleure description du métier

Promouvoir l'enseignement long et diversifié, parce que la discipline se complexifie et que l'emploi n'est plus pérenne:

-Proposer des licences & masters pro sur les nouvelles problématiques ($\rightarrow$UPS)

-Proposer des thèses

-Stages en alternance

-Réactiver l'enseignement au CNAM

-Offrir des documents en ligne pour aider l'auto-formation