DEPARTEMEN PENDIDIKAN NASIONAL
UNIVERSITAS SRIWIJAYA
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KEPUTUSAN
REKTOR UNIVERSITAS SRIWIJAYA
Nomor: /H9/DT.Kep/2009

TENTANG

KURIKULUM PENYELENGGARAAN PENDIDIKAN MAGISTER (S2)
PROGRAM STUDI PENDIDIKAN MATEMATIKA PROGRAM PASCASARJANA
UNIVERSITAS SRIWIJAYA
TAHUN 2009-2010

REKTOR UNIVERSITAS SRIWIJAYA

Memperhatikan : Surat Direktur Program Pascasarjana Unsri Nomor: .20/H9.1.10/DT/2009 tanggal April 2009 tentang penerbitan Keputusan Rektor Revisi Kurikulum Program Magister (S2) Program Studi Pendidikan Matematika Program Pascasarjana Unsri.

Menimbang :
a. Bahwa bidang Pendidikan Matematika merupakan bidang ilmu yang penting dan terus berkembang, maka perlu terus dilakukan penyempurnaan kurikulumnya yang berkualitas sesuai dengan perkembangan dan kebutuhan masyarakat.
b. Bahwa sehubungan dengan butir a di atas perlu diterbitkan Keputusan Rektor sebagai pedoman dan landasan hukumnya.

Mengingat :
1. Undang-undang Nomor: 20/2003, tentang Sistem Pendidikan Nasional;
2. Peraturan Pemerintah Nomor: 60/1999, tentang Pendidikan Tinggi;
3. Keputusan Presiden RI Nomor: 105/M Tahun 2007, tentang Pengangkatan Rektor Universitas Sriwijaya;
4. Keputusan Mendikbud Nomor: 0195/O/1995, tentang Organisasi dan Tata Kerja Universitas Sriwijaya;
5. Keputusan Mendiknas Nomor: 232/U/2000, tentang Pedoman Penyusunan Kurikulum Pendidikan Tinggi dan Penilaian Hasil Belajar Mahasiswa;
6. Kepmendiknas Nomor: 064/O/2003, tentang Statuta Universitas Sriwijaya;
7. Keputusan Dirjen Dikti Nomor: 83/DIKTI/Kep/2007 tentang Penataan dan Penetapan Kembali Ijin Penyelenggaraan Program Studi pada Universitas Sriwijaya.

MEMUTUSKAN

MENETAPKAN

Pertama : Keputusan Rektor Universitas Sriwijaya tentang Kurikulum Penyelenggaraan Pendidikan Program Magister (S2) Program Studi Pendidikan Matematika Program Pascasarjana Universitas Sriwijaya;

Kedua : Kurikulum Program Studi seperti dimaksud pada butir pertama adalah sebagaimana tercantum dalam lampiran surat keputusan ini;

Ketiga : Kurikulum seperti dimaksud pada butir pertama dan kedua mulai diberlakukan pada tahun akademik 2009/2010;

Keempat : Keputusan ini berlaku sejak tanggal ditetapkan dengan ketentuan, bahwa segala sesuatu akan diubah dan/atau diperbaiki sebagaimana mestinya apabila ternyata di kemudian hari terdapat kekeliruan dalam keputusan ini.

Ditetapkan di : Inderalaya
Pada Tanggal :
Rektor,

Prof. Dr. Badia Perizade, M.B.A.
NIP 130785359

Tembusan Yth.:
1. Direktur Program Pascasarjana Unsri
2. Dekan FKIP
3. Ketua Program Studi Pendidikan Matematika PPs Unsri

Lampiran Keputusan Rektor Unsri
Nomor : /H9/DT.Kep/2009
Tanggal : April 2009

KURIKULUM PENYELENGGARAAN PENDIDIKAN PROGRAM MAGISTER (S2) PROGRAM STUDI PENDIDIKAN MATEMATIKA PROGRAM PASCASARJANA UNIVERSITAS SRIWIJAYA TAHUN AKADEMIK 2009/2010

I. VISI

Menjadikan Program Studi Pendidikan Matematika Program Pascasarjana Universitas Sriwijaya sebagai salah satu penyelenggara pendidikan pascasarjana di Indonesia bidang ilmu pendidikan matematika yang unggul dalam pengembangan sumber daya manusia, riset, informasi, dan inovasi kependidikan sehingga mampu menghasilkan lulusan yang bermutu baik dalam penguasaan teori maupun praktik kependidikan pada tahun 2015.

II. MISI

a. Menyelenggarakan kegiatan, pengelolaan, dan proses pendidikan yang efektif dan efisien untuk menghasilkan pendidik dan tenaga ahli pendidikan matematika yang profesional.
b. Mengembangkan gagasan-gagasan baru dan orisinil sebagai sumbangsih bagi perkembangan pendidikan dan pembelajaran matematika pada berbagai tingkatan pendidikan melalui berbagai kegiatan penelitian dan forum ilmiah.
c. Mengupayakan penerapan dan transformasi gagasan-gagasan baru dan segar dalam bidang pendidikan dan pembelajaran matematika kepada masyarakat untuk memperbaiki penyelenggaraan pendidikan dan pembelajaran matematika pada berbagai tingkat pendidikan.

III. TUJUAN

Tujuan penyelenggaraan pendidikan Magister (S2) Program Studi Pendidikan Matematika Program Pascasarjana Universitas Sriwijaya adalah sebagai berikut.

1. Menghasilkan lulusan yang bermutu, yaitu pendidik dan tenaga kependidikan dalam bidang studi matematika untuk berbagai tingkat pendidikan yang mampu mengikuti tuntutan perkembangan zaman, ilmu pengetahuan, teknologi, seni, dan informasi, mampu mengembangkan gagasan-gagasan baru dan orisinal bagi perkembangan pendidikan dan pembelajaran matematika melalui penelitian dan forum ilmiah, dan mampu menerapkan dan mentransformasikan gagasan-gagasan itu untuk memperbaiki penyelenggaraan pendidikan dan/atau proses pembelajaran matematika.
2. Mengembangkan ilmu pendidikan dan pembelajaran bidang studi matematika untuk berbagai tingkat pendidikan melalui perkuliahan, bimbingan penelitian, diskusi, dan berbagai forum ilmiah.
3. Menghasilkan karya yang dapat diterapkan dan ditransformasikan untuk memperbaiki penyelenggaraan pendidikan dan/atau proses pembelajaran matematika, serta dapat meningkatkan hubungan sinergis dengan lembaga lain, dan masyarakat pengguna, yang diutamakan bersumber dari hasil penelitian yang berkualitas.

IV. SASARAN

Sasaran Penyelenggaraan PS Pendidikan Matematika Program Pascasarjana Unsri adalah mahasiswa :

1. mempunyai kemampuan pedagogik.
2. mempunyai kemampuan akademik atau profesional dan
3. mempunyai kemampuan kepribadian dan sosial terkait pendidikan matematika.

V. KURIKULUM

Program Studi Teknik Sipil memiliki 5 (lima) bidang kajian utama (BKU), yaitu:

1. Dosen
2. Guru
3. Bilingual
4. Internasional

1. Kurikulum BKU Dosen

A. MATA KULIAH MATRIKULASI

NO	KODE	NAMA MATA KULIAH	SKS	SEMESTER
1	GIP41108	Bahasa Inggris	0	Ganjil / Genap
2	GMA41108	Komputer	0	Ganjil / Genap
3	GMA41208	Matematika Dasar	0	Ganjil / Genap

B. MATAKULIAH KEILMUAN & KETRAMPILAN

NO	KODE	NAMA MATA KULIAH	SKS	SEMESTER
1	GIP52108	Filsafat Ilmu	2	Ganjil
2	GIP52208	Metodologi Penelitian Pendidikan	3	Ganjil
3	GIP52308	Landasan dan Problematika Pendidikan	2	Ganjil
4	GIP62108	Seminar Proposal	2	Ganjil / Genap
5	GIP62109	Seminar Hasil	1	Ganjil / Genap
6	GIP69108	Tesis	6	Ganjil / Genap

C. MATA KULIAH PERILAKU BERKARYA

NO	KODE	NAMA MATA KULIAH	SKS	SEMESTER
1	GMA57108	Desain Pembelajaran Matematika	2	Genap
2	GMA67108	Praktik Pengalaman Lapangan	2	Ganjil
3	GMA67208	Evaluasi Proses dan Hasil Belajar Matematika	3	Ganjil/Genap

D. MATA KULIAH KEAHLIAN BERKARYA

NO	KODE	NAMA MATA KULIAH	SKS	SEMESTER
1	GMA54108	Struktur Aljabar	3	Ganjil
2	GMA55208	Analisis Real	3	Genap
3	GMA55308	Analisis Statistika	3	Genap
4	GMA55408	Geometri	3	Genap/Ganjil
5	GMA64508	Matematika Diskrit	2	Ganjil
6	GMA55608	Pendidikan Matematika Realistik	2	Ganjil
7	GMA54708	Pembelajaran Matematika Sekolah dalam Bahasa Inggris	2	Genap
8	GMA55908	ICT dalam Pendidikan Matematika	2	Ganjil
		TOTAL	43	

2. Kurikulum BKU Guru

A. MATA KULIAH MATRIKULASI

NO	KODE	NAMA MATA KULIAH	SKS	SEMESTER
1	GIP 41108	Bahasa Inggris	0	Ganjil / Genap
2	GMA41108	Komputer	0	Ganjil / Genap
3	GMA41208	Matematika Dasar	0	Ganjil / Genap

B. MATAKULIAH KEILMUAN & KETRAMPILAN

NO	KODE	NAMA MATA KULIAH	SKS	SEMESTER
1	GIP52108	Filsafat Ilmu	2	Ganjil
2	GIP52208	Metodologi Penelitian Pendidikan	3	Ganjil
3	GIP52308	Landasan dan Problematika Pendidikan	2	Ganjil
4	GIP62108	Seminar Proposal	2	Ganjil / Genap
5	GIP62109	Seminar Hasil	1	Ganjil / Genap
6	GIP69108	Tesis	6	Ganjil / Genap

C. MATA KULIAH PERILAKU BERKARYA

NO	KODE	NAMA MATA KULIAH	SKS	SEMESTER
1	GMA57108	Desain Pembelajaran Matematika	2	Genap
2	GMA67108	Praktik Pengalaman Lapangan	2	Ganjil
3	GMA67208	Evaluasi Proses dan Hasil Belajar Matematika	3	Ganjil

D. MATA KULIAH KEAHLIAN BERKARYA

NO	KODE	NAMA MATA KULIAH	SKS	SEMESTER
1	GMA54108	Matematika sekolah I	3	Ganjil
2	GMA55208	Matematika sekolah II	3	Genap
3	GMA55308	Statistik pendidikan	3	Genap
4	GMA55408	Sejarah Matematika	2	Genap
5	GMA55608	Pendidikan Matematika Realistik	3	Ganjil
6	GMA54708	Pembelajaran Matematika Sekolah dalam Bahasa Inggris	2	Genap
7	GMA55908	ICT dalam Pendidikan Matematika	2	Ganjil
		TOTAL	42	

3. BIDANG KAJIAN UTAMA (BKU BILINGUAL)

A. MATA KULIAH WAJIB

NO	KODE	NAMA MATA KULIAH	SKS	SEMESTER
1	BLG62109	Research Methodology	3	Genap
2	BLG51109	Introduction to Realistic Mathematics Education	3	Ganjil
3	BLG51309	Problem Solving	2	Genap
4	BLG51509	Algebra Structure	3	Ganjil
5	BLG51409	ICT in Mathematics Education	3	Ganjil
6	BLG52309	Assessment in Mathematics Education	3	Genap
7	BLG61309	Research Preparation / Seminar Proposal	2	Ganjil/Genap
8	BLG62109	Seminar Research Results	1	Ganjil/Genap
9	BLG62209	Master Thesis	6	Ganjil/Genap
		TOTAL	26	

B. MATAKULIAH BKU BLINGUAL

NO	KODE	NAMA MATA KULIAH	SKS	SEMESTER
1	BLG51209	Mathematics Classroom Observation/ Product Development	2	Ganjil
2	BLG62509	Statistics in Education	2	Genap
3	BLG62309	History Mathematics	2	Genap
4	BLG52109	School Mathematics 1:Primary Schools	3	Ganjil
5	BLG52209	Teaching School Mathematics in English 1	3	Ganjil
6	GMA61109	School Mathematics 2 :Middle Schools	3	Genap
7	BLG61209	Teaching School Mathematics in English 2	3	Genap
8	BLG61409	Field Experience/ workshop Mathematics	1	Ganjil/Genap
		TOTAL	19	
TOTAL A and B			45	

4. BIDANG KAJIAN UTAMA (BKU INTERNASIONAL)

COURSES OFFERED IN IMPOME (BKU International)

A. INDONESIAN PERIODE MAY-DECEMBER

NO	CODE	COURSES	CREDITS	PERIOD
1.	ENG51109	Intensive English Course (3 months)	-	May-July
2.	EDU51209	Mathematics Classroom Observation/ Product Development	3	May-July Aug-Dec
3.	EDU51309	Introduction to Realistic Mathematics Education	3	Aug-Dec
4.	MAT51409	Problem Solving	3	Aug-Dec
5.	MAT51509	Abstract Algebra	3	Sep-Dec
6.	MAT51609	ICT in Mathematics Education	3	Sep-Dec
		TOTAL	15	

B. THE NETHERLANDS PERIODE JANUARY-DESEMBER

NO	CODE	COURSES	CREDITS	PERIOD
1.	-	Introduction	-	January
2.	MAT52110	History Mathematics	3	Feb - Jun
3.	MAT52210	Mathematical workgroup	3	Feb - Jun
4.	EDU52310	Domain Specific Education 1	3	Feb - Jun
5.	EDU52410	Research Methodology	3	Feb - Jun
6.	MAT61110	To prove & to reason	3	Sept – Des
7.	MAT611210	Mathematical workgroup	3	Sept – Des
8.	EDU611310	Domain Specific Education 2	3	Sept – Des
9.	EDU611410	Research Preparation / Seminar Proposal	2	Oct - Des
		TOTAL	23	

C. INDONESIAN PERIODE JANUARY - JUNE

NO	CODE	COURSES	CREDITS	PERIOD
1.	EDU62111	Research, Internship in an Elementary School	2	Jan - Apr
2.	EDU62211	Master Thesis	10	Apr – Jun
		TOTAL	12	
TOTAL A, B, and C			50	

SILABUS MATA KULIAH PROGRAM MAGISTER (S2)
PROGRAM STUDI PENDIDIKAN MATEMATIKA
PROGRAM PASCASARJANA UNIVERSITAS SRIWIJAYA
TAHUN AKADEMIK 2009/2010

SILABUS MATAKULIAH UMUM

GIP41108 - Bahasa Inggris (0 SKS)
Mata kuliah ini bertujuan mempersiapkan mahasiswa untuk memahami buku teks, artikel, dan makalah dalam bahasa Inggris. Topik-topik yang diambil berasal dari berbagai sumber dalam bidang pendidikan matematika. Titik berat kegiatan belajar mengajar adalah telaah sumber pustaka yang ditulis dalam bahasa Inggris dan mempresentasikannya di depan kelas. Mata kuliah ini ditawarkan setiap semester.

GMA41108 - Komputer (0 SKS)
Mata kuliah ini bertujuan membantu mahasiswa untuk terampil menggunakan komputer khususnya untuk pemrosesan kata dan angka, pengolahan dan analisis statistik data penelitian, dan internet yang dapat dipakai dalam mencari data dan informasi. Mata kuliah ini ditawarkan setiap semester.

GMA41208 - Matematika Dasar (0 SKS)
Mata kuliah ini pada dasarnya bertujuan untuk penyegaran dan sedikit kajian mendalam beberapa topik matematika penunjang mata kuliah matematika yang harus diambil setelah menjadi mahasiswa Magister Pendidikan Matematika. Mata kuliah ini ditawarkan setiap semester.

GIP52108 - Filsafat Ilmu (2 SKS)
Mata kuliah ini membahas hakikat ilmu pengetahuan dari sudut ontologi, epistemologi, dan aksiologi. Pengalaman belajar filsafat ilmu bertujuan untuk membentuk wawasan dan kemampuan mahasiswa agar dapat berperan di dalam kegiatan pengembangan ilmu dan teknologi kependidikan. Pokok-pokok bahasan antara lain meliputi dasar-dasar ilmu pengetahuan, kerangka berpikir ilmiah, kriteria kebenaran, hakikat bahasa, matematika, dan statistika sebagai sarana berpikir ilmiah, etos ilmu pengetahuan, dan perkembangan ilmu dan teknologi serta pengaruhnya terhadap tata nilai kebudayaan dan kehidupan bangsa.

GIP52208 - Metodologi Penelitian Pendidikan (3 SKS)
Mata kuliah ini membahas prinsip-prinsip dan prosedur penelitian ilmiah sebagai pengetahuan dasar dalam penulisan tesis. Topik yang dibahas antara lain meliputi konsep, konstruk, dan variabel, hubungan antara teori dan hipotesis, jenis-jenis dan rancangan penelitian, penyusunan instrumen penelitian, teknik pengumpulan dan pengolahan data, dan aturan-aturan dalam penulisan laporan ilmiah.

GIP52308 - Landasan dan Problematika Pendidikan (2 SKS)
Mata kuliah ini mengkaji wawasan kependidikan terutama dengan cara melihat hubungan antara sistem pendidikan dengan sistem yang lebih tinggi (hubungan vertikal) dan hubungan antar sistem pendidikan dengan sistem setara (hubungan horizontal), seperti sistem-sistem sosial, budaya, ilmu pengetahuan dan teknologi, ekonomi dan sebagainya serta membahas permasalahan-permasalah dalam konteks perkembangan pendidikan matematika dan pembangunan di Indonesia. Topik yang dibahas antara lain isu-isu pendidikan matematika dan pembangunan bangsa baik secara makro dan mikro, pendidikan formal dan nonformal, dan beberapa masalah lain dalam usaha mengadakan inovasi pendidikan matematika.

GIP62108 - Seminar Proposal (2 SKS)
Mata kuliah ini bertujuan untuk memberikan forum secara formal bagi mahasiswa untuk memberikan seminar dan menyajikan rancangan penelitian tentang topik yang akan dibahas dalam tesis magisternya.

GIP62109 - Seminar Hasil (1 SKS)
Mata kuliah ini merupakan kegiatan terstruktur berupa seminar ilmiah dari laporan atau hasil penelitian yang telah dilakukan.

GIP69108 - Tesis (6 SKS)
Mata kuliah ini memberi pengalaman kerja mandiri kepada mahasiswa dalam merencanakan dan melaksanakan penelitian mengenai suatu masalah dalam bidang pendidikan matematika, serta penulisan laporan karya ilmiah dalam bentuk tesis di bawah bimbingan setidak-tidaknya dua orang pembimbing. Karya ilimiah tersebut

berbentuk hasil suatu proyek penelitian yang menghasilkan suatu produk tertentu dalam bidang pendidikan dan pengajaran seperti kurikulum, bahan pengajaran, instrumen evaluasi dan sebagainya. Termasuk dalam kegiatan penulisan tesis adalah kewajiban menyampaikan usulan (proposal) dan hasil penelitian dalam suatu forum seminar program studi yang dihadiri oleh semua dosen pembimbing, dosen-dosen program studi, dan mahasiswa serta kewajiban untuk mempublikasikan tesis atau bagiannya dalam suatu presentasi ilmiah atau pada majalah/jurnal ilmiah.

GMA57108 - Desain Pembelajaran Matematika (2 SKS)
Mata kuliah ini membahas teori pembelajaran dan penerapannya dalam merencanakan dan mengembangkan kegiatan belajar mengajar matematika di sekolah. Juga mengembangkan model-model pembelajaran suatu topik dalam matematika termasuk bahan ajar untuk jenjang S0/S1.

GMA67108 - Praktik Pengalaman Lapangan (2 SKS)
Mata kuliah ini bertujuan agar mahasiswa mampu merencanakan, melaksanakan, dan mengevaluasi proses dan hasil pembelajaran matematika yang inovatif. PPL dapat dilaksanakan pada berbagai jenjang pendidikan, baik pendidikan dasar, menengah, dan tinggi.

GMA67208 - Evaluasi Proses dan Hasil Belajar Matematika (3 SKS)
Mata kuliah ini membahas macam-macam strategi belajar mengajar dalam pendidikan matematika dalam kaitannya dengan kurikulum yang berlaku serta membahas berbagai teknik evaluasi dan pengembangan bentuk-bentuk alat evaluasi kemampuan matematika. Topik-topik yang dibahas antara lain meliputi beberapa pendekatan pengajaran matematika, teori-teori belajar mengajar dan penerapannya pada pokok bahasan tertentu, serta simulasi pengajaran matematika, berbagai teknik evaluasi dan pengembangan alat evaluasi.

A. SILABUS MATAKULIAH BKU DOSEN

GMA54108 - Struktur Aljabar (3 SKS)
Mata kuliah ini bertujuan agar mahasiswa mampu memahami beberapa struktur aljabar abstrak dan dapat memanfaatkannya dalam menyelesaikan masalah sederhana dalam aljabar serta mampu berpikir logis dan bernalar secara matematika dalam menyelesaikan masalah. Topik-topik yang dibahas antara lain meliputi grup, subgroup, gelanggang, lapangan, dan homomorfisma.

GMA55208 - Analisis Real (3 SKS)
Mata kuliah ini bertujuan agar mahasiswa mampu memahami konsep-konsep barisan dan deret serta kekonvergenannya dan konsep-konsep ruang metrik secara umum serta memiliki wawasan yang luas tentang konsep-konsep dasar yang digunakan pada kalkulus, khususnya kalkulus fungsi satu peubah. Topik-topik yang dibahas antara lain barisan dan deret, barisan dan deret tak hingga, uji kekonvergenan, keterbatasan, kemonotonan.

GMA55308 - Analisis Statistika (3 SKS)
Mata kuliah ini membahas gagasan dasar statistik parametrik dan non-parametrik yang banyak digunakan dalam penelitian serta mampu menggunakan alat pengolah data dengan bantuan software statistik, seperti Minitab dan SPSS sehingga dapat membantu mahasiswa menganalisis data penelitian. Topik-topik yang dibahas antara lain beberapa uji statistik parametrik dan non-parametrik, analisis regresim, korelasi, dan variansi.

GMA55408 - Geometri (3 SKS)
Mata kuliah bertujuan agar mahasiswa mampu memahami metode membangun sebuah geometri dari pengertian himpunan yang di dalamnya diberlakukan berbagai sistem aksioma sebagai landasan untuk penalaran logis dan menumbuhkan prakarsa serta kreativitas. Topik-topik yang dibahas antara lain meliputi sistem aksioma pada geometri netral, kelompok aksioma insidensi, kelompok aksioma kongruen, dan aksioma Archimedes.

GMA64508 - Matematika Diskrit (2 SKS)
Mata kuliah ini bertujuan agar mahasiswa mengenal beberapa konsep dan objek matematika yang digunakan dalam ilmu komputer dan mampu menerapkannya dalam pengkajian ilmu komputer. Topik-topik yang dibahas antara lain meliputi fungsi, operator biner dan n-er, fungsi karakteristik, himpunan, fungsi rekursif, teori graf dan aljabar Boole.

GMA55608 - Pendidikan Matematika Realistik (2 SKS)
Mata kuliah ini mengenai Pendidikan Matematika Realistik sebagai Teori Pembelajaran dalam pendidikan matematika yang menekankan kepada penggunaan konteks dalam memulai pembelajaran matematika. Fokusnya adalah pada pendesainan model pembelajaran dan pengembangan instrumen evaluasi matematika sekolah berdasarkan teori tersebut.

GMA54708 - Pembelajaran Matematika Sekolah dalam Bahasa Inggris (2 SKS)
Mahasiswa membahas berbagai topik dalam matematika sekolah dan mengajarkannya di depan teman mereka dalam bahasa Inggris (*peer teaching*).

GMA55908 - ICT dalam Pendidikan Matematika (2 SKS)
Mata kuliah ini bertujuan agar mahasiswa mampu memahmi dan menerapkan teknologi informasi dan komunikasi (*Information and Communication Technology/ICT)* dalam pendidikan matematika. Topoik-topik yang dibahas antara lain pemrograman komputer, paket aplikasi komputer, internet, dan situs web yang substansinya adalah matematika pada berbagai jenjang pendidikan.

B. SILABUS MATAKULIAH BKU GURU

GMA54108 - Matematika sekolah I (3 SKS)
Mata kuliah ini didisain untuk membantu mahasiswa untuk memperdalam pelajaran matematika Sekolah menengah (SMA dan SMP). Isi mata kuliah ini meliputi: Dasar-dasar aljabar (struktur bilangan riil, himpunan, fungsi, grafik fungsi, persamaan dan pertidaksamaan, relasi ekivalen, dan logika matematika), Geometri Analitik Bidang.

GMA55208 - Matematika sekolah II (3 SKS)
Mata kuliah ini didisain untuk membantu mahasiswa untuk memperdalam pelajaran matematika Sekolah menengah (SMA dan SMP). Isi mata kuliah ini meliputi: Matrik dan Vektor, Sistem persamaan, barisan dan deret bilangan, Geometri analitik Ruang, diferensial dan integral.

GMA55308 - Statistik Pendidikan (3 SKS)
Mata Kuliah ini membahas gagasan dasar teknik-teknik nalisis dalam penelitian kuantitatif dengan tekanan pada statistik imferensial. Pada akhirnya mahasiswa diharapkan mampu memahami laporan-laporan penelitian dan mengolah data penelitian yang dikumpulkan dalam penulisan tesis.

GMA55408 - Sejarah Matematika (2 SKS)
Mata kuliah ini didisain agar mahasiswa memperoleh pemahaman tentang bagaimana ide matematika dikembangkan, bagaimana faktor sejarah, sosial dan budaya dalam pandangan ilmu pengetahuan dapat dipengaruhi oleh perkembangan matematika. Proses penemuan konsep-konsep matematika oleh matematikawan merupakan sumber inspirasi bagi mahasiswa dalam menyusun materi ajar. Materi mata kuliah ini meliputi sejarah matematika di Mesir dan Mesoptamia, Yunani dan Hellenistis, Arab Saudi, Cina dan Mayan, di Eropa.

GMA55608 - Pendidikan Matematika Realistik (2 SKS)
Mata kuliah ini mengenai Pendidikan Matematika Realistik sebagai Teori Pembelajaran dalam pendidikan matematika yang menekankan kepada penggunaan konteks dalam memulai pembelajaran matematika. Fokusnya adalah pada pendesainan model pembelajaran dan pengembangan instrumen evaluasi matematika sekolah berdasarkan teori tersebut.

GMA54708 - Pembelajaran Matematika Sekolah dalam Bahasa Inggris (2 SKS)
Mahasiswa membahas berbagai topik dalam matematika sekolah dan mengajarkannya di depan teman mereka dalam bahasa Inggris (*peer teaching*).

GMA55908 - ICT dalam Pendidikan Matematika (2 SKS)
Mata kuliah ini bertujuan agar mahasiswa mampu memahmi dan menerapkan teknologi informasi dan komunikasi (*Information and Communication Technology/ICT)* dalam pendidikan matematika. Topoik-topik yang dibahas antara lain pemrograman komputer, paket aplikasi komputer, internet, dan situs web yang substansinya adalah matematika pada berbagai jenjang pendidikan.

C. BIDANG KAJIAN UTAMA (BKU BILINGUAL)

BLG62109 - Research Methodology (3 SKS)
In this course the students will learn more about the approach of the design research (cyclic approach, local instruction theory, retrospective analysis, etc.). On the basis of J. Creswall, Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (2nd Edition) the students will learn more about research and about writing a paper. The courses DEC and Methodology are combined. All kind of research abilities will be trained (literature study, narrative approach, interviewing, observation, etc.)

BLG51109 - Introduction to Realistic Mathematics Education (3 SKS)
The students will learn about the approach of the RME. In the program there is a lot of attention for the practical side of mathematics education. They will observe video and analyze reports from the PMRI-project. mportant aspects: Rich contextual situations; modeling (also schemes and symbolization); social interaction; levels doing mathematics; intertwining of learning strands. Basic didactical thoughts within some domains: number sense, counting up to 100, algorithms, measuring, geometry, proportions, fractions

BLG51309 - Problem Solving (2 SKS)
The students will solve mathematical problems (Olympiad and Wiskunde-B). They make a report and present it in the whole class discussion.

BLG51509 - Algebra Structure (3 SKS)
The aim of the course is to gain an understanding basics of mathematics in university and to use it in elementary mathematics.The topics of course include set and function, solving linear and quadratic equations, real number structure, mathematical induction, factorization, sequence and series of real number, complex number, polynomial, algebra fundamental theorem, limit and continuity.

BLG51409 - ICT in Mathematics Education(3 SKS)
The students are provided an overview of computer system, ICT and its development, use of ICT in mathematics, java applet programming, web-based mathematics resources, developing website or weblog and using it in teaching-learning of school mathematics.

BLG52309 - Assessment in Mathematics Education (3 SKS)
The students will learn how to develop assessment materials and how to use either in formative evaluation or summative evaluation. They are also learn how to analyze student's solutions.

BLG61309 - Research Preparation / Seminar Proposal (2 SKS)
All students will give a presentation about their research and the Hypothetical Learning Trajectory

BLG62109 - Seminar Research Results (1 SKS)
All students will give a presentation about their research results from the field as well as their written thesis

BLG62209 - Master Thesis (6 SKS)
In this period the students will write the master thesis. This will consist of an overview of the design they described earlier, a retrospective analysis and recommendations for implementing their design of the learning trajectory. Every students will have two supervisors (one in Indonesia and one in the Netherlands) Every two weeks they will send the draft of the thesis they already. The assessment will be done by two assessors (one from Indonesia and one from The Netherlands (external assessor)). The external assessor will cosign the diploma.

BLG51209 - Mathematics Classroom Observation/ Product Development (2 SKS)
Classroom observations and interviews students on thinking processes. The students will learn about the PRMI-project; The observation reports will serve as instruments for the selection of students (abilities in language, in accuracy of observation, evaluation and reflection); It is a preparation for the researches in the class room. Students are observing in the class room + subject students to an interview. The students will also students hold to an assessment, The first two weeks the students will observe in class 1, 2 or 3 (the student will make his own choice). The next two weeks they will observe in class 4 or class 5.The students will develop a small learning environment for the elementary school. Therefore they will describe activities for students (in a specific domain), the goals, the starting positions and their expectations about the intended learning processes. They also will write a teacher manual in which they will give just enough information for the teacher to understand what they mean, what they hope to achieve, what the teacher has to say and do. The teacher must be able to observe

appropriately: he/she must be aware of your thinking, your aim for the research and your intentions with the HLT. There is one experiment with the learning environment. The students will observe this and will interview the teacher and some students beforehand and afterwards.

BLG62509 - Statistics in Education (2 SKS)
The students will learn statistics in education. The materials will be used either for teaching statistics in the school or analyze the data of the master thesis.

BLG62309 - History Mathematics (2 SKS)
Specific topics of the mathematics will be studied in a historical way. A significant part of the course consists of exercises and assignments.

BLG52109 - School Mathematics 1:Primary Schools (3 SKS)
The students will learn the concepts of all topics mathematics in the primary schools. They are also learn how to prepare the lesson materials for the pupils as well as for teachers.

BLG52209 - Teaching School Mathematics in English 1 (3 SKS)
The students will learn how to teach various topics of primary school mathematics either in peer teaching or in the primary schools classrooms.

GMA61109 - School Mathematics 2 :Middle Schools (3 SKS)
The students will learn the concepts of all topics mathematics in the middle schools. They are also learn how to prepare the lesson materials for the pupils as well as for the teachers.

BLG61209 - Teaching School Mathematics in English 2 (3 SKS)
The students will learn how to teach various topics of middle school mathematics either in peer teaching or in the middle schools classrooms.

BLG61409 - Field Experience/ workshop Mathematics (1 SKS)
The students will go to a national or international conference or workshop either in country or in a broad. They have to make a article or report.

D. BIDANG KAJIAN UTAMA (BKU INTERNASIONAL)

ENG51109 - Intensive English Course (3 months) (- SKS)
This course aims mainly at preparing the students to take a toefl test. They will learn all components of the test such as listening, grammar, reading, and writing. In addition, students will learn write and present a number of reports based on the results of their classroom in primary schools. This course will be taken by students parallel to the EDU51209 course.

EDU51209 - Mathematics Classroom Observation/ Product Development (3 SKS)
Classroom observations and interviews students on thinking processes. The students will learn about the PRMI-project; The observation reports will serve as instruments for the selection of students (abilities in language, in accuracy of observation, evaluation and reflection); It is a preparation for the researches in the class room. Students are observing in the class room + subject students to an interview. The students will also students hold to an assessment, The first two weeks the students will observe in class 1, 2 or 3 (the student will make his own choice). The next two weeks they will observe in class 4 or class 5.

The students will develop a small learning environment for the elementary school. Therefore they will describe activities for students (in a specific domain), the goals, the starting positions and their expectations about the intended learning processes. They also will write a teacher manual in which they will give just enough information for the teacher to understand what they mean, what they hope to achieve, what the teacher has to say and do. The teacher must be able to observe appropriately: he/she must be aware of your thinking, your aim for the research and your intentions with the HLT. There is one experiment with the learning environment. The students will observe this and will interview the teacher and some students beforehand and afterwards.

EDU51309 - Introduction to Realistic Mathematics Education (3 SKS)

The students will learn about the approach of the RME. In the program there is a lot of attention for the practical side of mathematics education. They will observe video and analyze reports from the PMRI-project. mportant aspects: Rich contextual situations; modeling (also schemes and symbolization); social interaction; levels doing mathematics; intertwining of learning strands. Basic didactical thoughts within some domains: number sense, counting up to 100, algorithms, measuring, geometry, proportions, fractions

MAT51409 - Problem Solving (3 SKS)
The students will solve mathematical problems (Olympiad and Wiskunde-B. They make a report and present it in the whole class discussion.

MAT51509 - Abstract Algebra (3 SKS)
Understanding (1) basic definitions, (2) basic theorems and their proofs, (3) knowing a variety of examples, (4) problem solving. They are also given opportunity to think logically, precisely and mathematically, including (1) writing complete sentence arguments with every steps justified (2) presenting verbal arguments in class (3) answering new questions in an orderly manner (4) knowing what types of questions are asked, and formulating some of those questions.

MAT51609 - ICT in Mathematics Education (3 SKS)
The students are provided an overview of computer system, ICT and its development, use of ICT in mathematics, java applet programming, web-based mathematics resources, developing website or weblog and using it in teaching-learning of school mathematics.

Introduction (- SKS)
Introduction to the Dutch culture and the educational system; a preamble to the study program and an introduction to the Dutch education. the goals are habituation to the Dutch culture and to the people of the Freudenthal Institute; exchange between the Indonesian and Dutch culture; to learn about the Dutch educational system in prospect of the study program mathematics education (and to compare it with the Indonesian educational system); to become accustomed to the study program mathematics education; and to do mathematics in a lively and stimulating way.

MAT52110 - History Mathematics (3 SKS)
Specific topics of the mathematics will be studied in a historical way. A significant part of the course consists of exercises and assignments.

MAT52210 - Mathematical Workgroup (3 SKS)
All students are investigating specific mathematical problems (at master level). They cooperate in small groups (with a tutor). There are specific forms of literature study. Possible topics:
- Sunrise and sunset on the world/around the world.
- Leslie- Matrices, Mathematics A, Population growth,
- Intro analytical geometry, complex numbers
- Parameter curves and what you can do with them
- Geometry, reasoning, from axioms and from a model.
- Geometrical construction: rule and compass, with conic sections,
- Cabri.
- Geometry on the bulb
- Discrete and continuous (in analysis): limits, foundations of calculus. rows, recurring relations, modelling.
- Differentiating in context: speed and movement vs. economical applications
- Algorithms and ICT; codes etc.; number theory
- Puzzles and group theory. (e.g., 14-15 and Rubik's cube)
- Conical sections: conflict line, sections, equation, construction.
- A topic from the history of mathematics
- Islamic geometry
- Escher's mathematics
- Fractals
- Golden section

The following criteria are applied in assessing the final report:
- To what degree the report provides a good overview of the selected (mathematical) field;
- To what degree general mathematical theories have been included in the selected subject;
- Proven research abilities during the analytical phase;

- Writing and reasoning abilities as recorded in preliminary versions and the final report for the project;
- Representation of the literature the student has studied;
- Use of general mathematical techniques;
- Inventiveness in raising, and possibly solving, mathematical problems;
- The student's evaluative and reflective abilities;
- The student's personal development and progress.

EDU52310 - Domain Specific Education 1 (3 SKS)

The students will learn about the important didactic issues (in a practical way): mathematics as an activity, guided reinvention, context-based approach, learning processes as a didactical principle, observation as a didactical principle, levels in the learning processes.

I. In the first part of this course the students are doing an investigation in the materials of the MITC-project (Mathematics in the context) in a guided way. The students will write a paper about this investigation.
II. In the second part of this course the students will (in small groups) do an investigation in the class room (a two-lesson study)

EDU52410 - Research Methodology (3 SKS)

In this course the students will learn more about the approach of the design research (cyclic approach, local instruction theory, retrospective analysis, etc.). On the basis of J. Creswall, Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (2nd Edition) the students will learn more about research and about writing a paper. The courses DEC and Methodology are combined. All kind of research abilities will be trained (literature study, narrative approach, interviewing, observation, etc.)

MAT61110 - To Prove & To Reason (3 SKS)

The mathematics education community worldwide is facing the challenge of improving students' ability to prove and reason mathematically at all grade levels. Prior research has shown that young children can make legitimate mathematical arguments and even formal arguments that count as proof. Yet, many prospective and practicing elementary teachers hold a procedure-based view of mathematics and to verify mathematical statements, they rely on external authority (textbook or instructor) or accept a few examples as evidence of truth. In this course the students will learn: what is a proof, what are mathematical arguments, what kind of reasoning do you use, etc. We aim in this course at an academic level; however we want also to think about different levels of proving mathematical statements (depending on the context).

MAT611210 - Mathematical Workgroup (3 SKS)

As follow up of the mathematical workgroup (period February – June) the students will compose a mathematics book for the higher levels of the secondary school (pre academic) or for bachelor students mathematics education. This book consists of three parts: a textbook for students, a teacher guide and a rationale. The students will work in small groups (3 or 4 students) with a tutor. A number of criteria are applied in assessing the final report. This will depend on how theories have been applied to the chosen subject, proven research abilities during the analytical phase, writing and reasoning abilities as recorded in preliminary versions and the final report for the project. Based on this report, a decision is made on whether the student can continue to the second phase: making a learning environment to accompany the mathematical exposition.

EDU611310 - Domain Specific Education 2 (3 SKS)

The students will learn how to achieve a well considered design of a (part of a) learning trajectory, working from the theories of design research, and how to formulate a local instruction theory. Based on the mathematical domain the students have selected for their research in Indonesia they will provide an overview of the didactical theories for the domain in question (preparing the theoretical framework of the master thesis).

EDU611410 - Research Preparation/Seminar Proposal (2 SKS)

Parallel with the DEC course the students will make both a research plan and a design of a learning trajectory (for three weeks) with a series of activities and a teacher guide providing guidance. All students will work in small groups (2,3 or 4 students) with a tutor. In this period there are two moments that the students will send a report with their preparations of the research to their Indonesian supervisors (convincing your supervisor). They will get feedback from their Indonesian and Dutch supervisors.

The goal of seminar Research Proposal (one week program):

1. To reflect about the learning experiences in The Netherlands
2. To present the proposals for the research and the master thesis to the colleagues and the experts of the Freudenthal Institutes.
3. To take leave of Utrecht University

Parts of this one week program

- All students will give a presentation about their research and the HLT (we use special forms to prevent overkill for the audience)
- Evaluation and reflection of the master program
- Mathematical workshops (challenging opportunities)
- Some lectures and workshops from specialists in the educational domain
- A cultural exchange
- From Sinterklaas up to Christmas
- Farewell to the Indonesian students.

EDU62111 - Research, Internship in An Elementary School (2 SKS)

During the internship the students will be take care of: (1) An adequate execution of the design of a learning trajectory in a specific mathematical domain. The research will be embedded in observations in the classroom; the students must realize all the time what students thought processes are. Of course the students are also doing forms of assessment. The end product the students have to develop is an outline of a learning trajectory of three or four weeks in a specific grade (2) At the same time and in parallel the students will carry out the research plan, interviewing developers of teaching materials, teachers and students, observing learning situations and gather as much different data (student work, argued testing results and evaluations from among others the teachers) that can be used to answer your (formulated in advance) research questions.

EDU62211 Master Thesis (10 SKS)

In this period the students will write the master thesis. This will consist of an overview of the design they described earlier, a retrospective analysis and recommendations for implementing their design of the learning trajectory. Every students will have two supervisors (one in Indonesia and one in the Netherlands) Every two weeks they will send the draft of the thesis they already. The assessment will be done by two assessors (one from Indonesia and one from The Netherlands (external assessor)). The external assessor will cosign the diploma.

Rektor,

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